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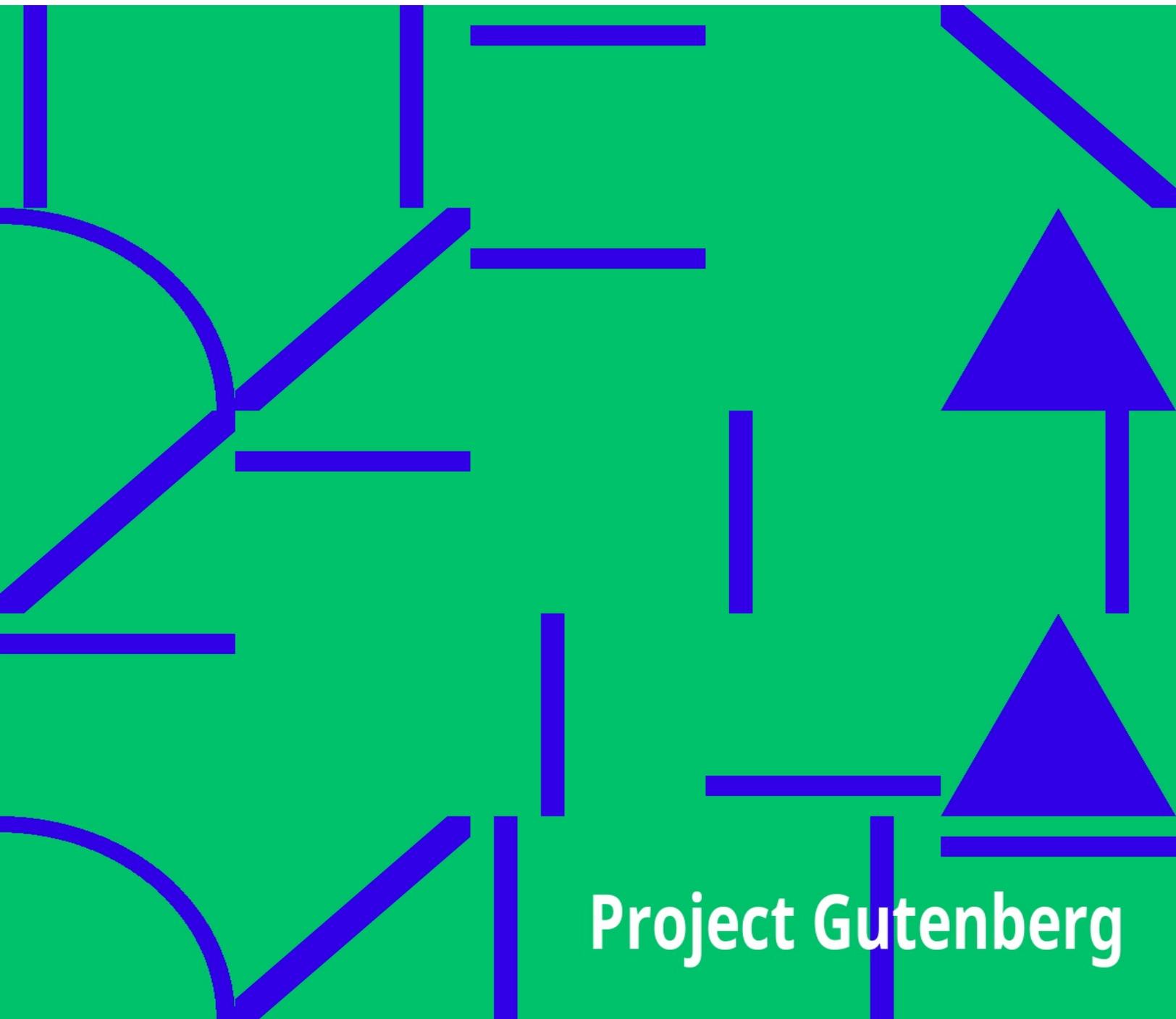
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The Mind and the Brain

Being the Authorised Translation of L'Âme et le Corps

Alfred Binet

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THE MIND AND THE BRAIN

BY

ALFRED BINET

**DIRECTEUR DU LABORATOIRE DE PSYCHOLOGIE
À LA SORBONNE**

BEING THE AUTHORISED TRANSLATION OF

L'ÂME ET LE CORPS

LONDON

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BOOK I

THE DEFINITION OF MATTER

THE MIND AND THE BRAIN^[1]

CHAPTER I

INTRODUCTION

This book is a prolonged effort to establish a distinction between what is called mind and what is called matter. Nothing is more simple than to realise this distinction when you do not go deeply into it; nothing is more difficult when you analyse it a little. At first sight, it seems impossible to confuse things so far apart as a thought and a block of stone; but on reflection this great contrast vanishes, and other differences have to be sought which are less apparent and of which one has not hitherto dreamed.

First let us say how the question presents itself to us. The fact which we must take as a starting point, for it is independent of every kind of theory, is that there exists something which is "knowable." Not only science, but ordinary life and our everyday conversation, imply that there are things that we know. It is with regard to these things that we have to ask ourselves if some belong to what we call the mind and others to what we call matter.

Let us suppose, by way of hypothesis, the knowable to be entirely and absolutely homogeneous. In that case we should be obliged to set aside the question as one already decided. Where everything is homogeneous, there is no distinction to be drawn. But this hypothesis is, as we all know, falsified by observation. The whole body of the knowable is formed from an agglomeration of extremely varied elements, amongst which it is easy to distinguish a large number of divisions. Things may be classified according to their colour, their shape, their weight, the pleasure they give us, their quality of being alive or dead, and so on; one much given to classification would only be troubled by the number of possible distinctions.

Since so many divisions are possible, at which shall we stop and say: this is the one which corresponds exactly to the opposition of mind and matter? The choice is not easy to make; for we shall see that certain authors put the distinction between the physical and the mental in one thing, others in another. Thus there have been a very large number of distinctions proposed, and their number is much greater than is generally thought. Since we propose to make ourselves judges of these distinctions, since, in fact, we shall reject most of them in order to suggest entirely new ones, it must be supposed that we shall do so by means of

a criterion. Otherwise, we should only be acting fantastically. We should be saying peremptorily, "In my opinion this is mental," and there would be no more ground for discussion than, if the assertion were "I prefer the Romanticists to the Classicists," or "I consider prose superior to poetry."

The criterion which I have employed, and which I did not analyse until the unconscious use I had made of it revealed its existence to me, is based on the two following rules:—

1. *A Rule of Method.*—The distinction between mind and matter must not only apply to the whole of the knowable, but must be the deepest which can divide the knowable, and must further be one of a permanent character. *A priori*, there is nothing to prove the existence of such a distinction; it must be sought for and, when found, closely examined.

2. *An Indication of the Direction in which the Search must be Made.*—Taking into account the position already taken up by the majority of philosophers, the manifestation of mind, if it exists, must be looked for in the domain of facts dealt with by psychology, and the manifestation of matter in the domain explored by physicists.

I do not conceal from myself that there may be much that is arbitrary in my own criterion; but this does not seem to me possible to avoid. We must therefore appeal to psychology, and ask whether it is cognisant of any phenomenon offering a violent, lasting, and ineffaceable contrast with all the rest of the knowable.

The Method of Concepts and the Method of Enumeration.—Many authors are already engaged in this research, and employ a method which I consider very bad and very dangerous—the method of concepts. This consists in looking at real and concrete phenomena in their most abstract form. For example, in studying the mind, they use this word "mind" as a general idea which is supposed to contain all the characteristics of psychical phenomena; but they do not wait to enumerate these characteristics or to realise them, and they remain satisfied with the extremely vague idea springing from an unanalysed concept. Consequently they use the word "mind" with the imprudence of a banker who should discount a trade bill without ascertaining whether the payment of that particular piece of paper had been provided for. This amounts to saying that the discussion of philosophical problems takes especially a verbal aspect; and the more complex the phenomena a concept thus handled, contains, the more dangerous it is. A concept of the colour red has but a very simple content, and by using it, this

content can be very clearly represented. But how can the immense meaning of the word "mind" be realised every time that it is used? For example, to define mind and to separate it from the rest of the knowable which is called matter, the general mode of reasoning is as follows: all the knowable which is apparent to our senses is essentially reduced to motion; "mind," that something which lives, feels, and judges, is reduced to "thought." To understand the difference between matter and mind, it is necessary to ask one's self whether there exists any analogy in nature between motion and thought. Now this analogy does not exist, and what we comprehend, on the contrary, is their absolute opposition. Thought is not a movement, and has nothing in common with a movement. A movement is never anything else but a displacement, a transfer, a change of place undergone by a particle of matter. What relation of similarity exists between this geometrical fact and a desire, an emotion, a sensation of bitterness? Far from being identical, these two facts are as distinct as any facts can be, and their distinction is so deep that it should be raised to the height of a principle, the principle of heterogeneity.

This is almost exactly the reasoning that numbers of philosophers have repeated for several years without giving proof of much originality. This is what I term the metaphysics of concept, for it is a speculation which consists in juggling with abstract ideas. The moment that a philosopher opposes thought to movement, I ask myself under what form he can think of a "thought," I suppose he must very poetically and very vaguely represent to himself something light and subtle which contrasts with the weight and grossness of material bodies. And thus our philosopher is punished in the sinning part; his contempt of the earthly has led him into an abuse of abstract reasoning, and this abuse has made him the dupe of a very naïve physical metaphor.

At bottom I have not much faith in the nobility of many of our abstract ideas. In a former psychological study^[2] I have shown that many of our abstractions are nothing else than embryonic, and, above all, loosely defined concrete ideas, which can satisfy only an indolent mind, and are, consequently, full of snares.

The opposition between mind and matter appears to me to assume a very different meaning if, instead of repeating ready-made formulas and wasting time on the game of setting concept against concept, we take the trouble to return to the study of nature, and begin by drawing up an inventory of the respective phenomena of mind and matter, examining with each of these phenomena the characteristics in which the first-named differ from the second. It is this last method, more slow but more sure than the other, that we shall follow; and we will commence by the study of matter.

FOOTNOTES:

[1] *L'Ame et la Corps*.—Disagreeable as it is to alter an author's title, the words "Soul and Body" had to be abandoned because of their different connotation in English. The title "Mind and Body" was also preoccupied by Bain's work of that name in this series. The title chosen has M. Binet's approval.—ED.

[2] *Étude expérimentale de l'Intelligence*. Paris: Schleicher.

CHAPTER II

OUR KNOWLEDGE OF EXTERNAL OBJECTS IS ONLY SENSATIONS

Of late years numerous studies have been published on the conception of matter, especially by physicists, chemists, and mathematicians. Among these recent contributions to science I will quote the articles of Duhem on the Evolution of Mechanics published in 1903 in the *Revue générale des Sciences*, and other articles by the same author, in 1904, in the *Revue de Philosophie*. Duhem's views have attracted much attention, and have dealt a serious blow at the whole theory of the mechanics of matter. Let me also quote that excellent work of Dastre, *La Vie et la Mort*, wherein the author makes so interesting an application to biology of the new theories on energetics; the discussion between Ostwald and Brillouin on matter, in which two rival conceptions find themselves engaged in a veritable hand-to-hand struggle (*Revue générale des Sciences*, Nov. and Dec. 1895); the curious work of Dantec on *les Lois Naturelles*, in which the author ingeniously points out the different sensorial districts into which science is divided, although, through a defect in logic, he accepts mechanics as the final explanation of things. And last, it is impossible to pass over, in silence, the rare works of Lord Kelvin, so full, for French readers, of unexpected suggestions, for they show us the entirely practical and empirical value which the English attach to mechanical models.

My object is not to go through these great studies in detail. It is the part of mathematical and physical philosophers to develop their ideas on the inmost nature of matter, while seeking to establish theories capable of giving a satisfactory explanation of physical phenomena. This is the point of view they take up by preference, and no doubt they are right in so doing. The proper rôle of the natural sciences is to look at phenomena taken by themselves and apart from the observer.

My own intention, in setting forth these same theories on matter, is to give prominence to a totally different point of view. Instead of considering physical phenomena in themselves, we shall seek to know what idea one ought to form of their nature when one takes into account that they are observed phenomena. While the physicist withdraws from consideration the part of the observer in the

verification of physical phenomena, our rôle is to renounce this abstraction, to re-establish things in their original complexity, and to ascertain in what the conception of matter consists when it is borne in mind that all material phenomena are known only in their relation to ourselves, to our bodies, our nerves, and our intelligence.

This at once leads us to follow, in the exposition of the facts, an order which the physicist abandons. Since we seek to know what is the physical phenomenon we perceive, we must first enunciate this proposition, which will govern the whole of our discussion: to wit—

Of the outer world we know nothing except our sensations.

Before demonstrating this proposition, let us develop it by an example which will at least give us some idea of its import. Let us take as example one of those investigations in which, with the least possible recourse to reasoning, the most perfected processes of observation are employed, and in which one imagines that one is penetrating almost into the very heart of nature. We are, let us suppose, dissecting an animal. After killing it, we lay bare its viscera, examine their colour, form, dimensions, and connections; then we dissect the organs in order to ascertain their internal nature, their texture, structure, and function; then, not content with ocular anatomy, we have recourse to the perfected processes of histology: we take a fragment of the tissues weighing a few milligrammes, we fix it, we mount it, we make it into strips of no more than a thousandth of a millimetre thick, we colour it and place it under the microscope, we examine it with the most powerful lenses, we sketch it, and we explain it. All this work of complicated and refined observation, sometimes lasting months and years, results in a monograph containing minute descriptions of organs, of cells, and of intracellular structures, the whole represented and defined in words and pictures. Now, these descriptions and drawings are the display of the various sensations which the zoologist has experienced in the course of his labours; to those sensations are added the very numerous interpretations derived from the memory, reasoning, and often, also, from the imagination on the part of the scholar, the last a source at once of errors and of discoveries. But everything properly experimental in the work of the zoologist proceeds from the sensations he has felt or might have felt, and in the particular case treated of, these sensations are almost solely visual.

This observation might be repeated with regard to all objects of the outer world which enter into relation with us. Whether the knowledge of them be of the common-place or of a scientific order matters little. Sensation is its limit, and all

objects are known to us by the sensations they produce in us, and are known to us solely in this manner. A landscape is nothing but a cluster of sensations. The outward form of a body is simply sensation; and the innermost and most delicate material structure, the last visible elements of a cell, for example, are all, in so far as we observe them with the microscope, nothing but sensation.

This being understood, the question is, why we have just admitted—with the majority of authors—that we cannot really know a single object as it is in itself, and in its own nature, otherwise than by the intermediary of the sensations it provokes in us? This comes back to saying that we here require explanations on the two following points: why do we admit that we do not really perceive the objects, but only something intermediate between them and us; and why do we call this something intermediate a sensation? On this second point I will offer, for the time being, one simple remark: we use the term sensation for lack of any other to express the intermediate character of our perception of objects; and this use does not, on our part, imply any hypothesis. Especially do we leave completely in suspense the question whether sensation is a material phenomenon or a state of being of the mind. These are questions we will deal with later. For the present it must be understood that the word sensation is simply a term for the something intermediate between the object and our faculty of cognition.^[3] We have, therefore, simply to state why we have admitted that the external perception of objects is produced mediately or by procuration.

There are a few philosophers, and those not of the lowest rank, who have thought that this intermediate character of all perception was so evident that there was no need to insist further upon it. John Stuart Mill, who was certainly and perhaps more than anything a careful logician, commences an exposition of the idealist thesis to which he was so much attached, by carelessly saying: "It goes without saying that objects are known to us through the intermediary of our senses.... The senses are equivalent to our sensations;"^[4] and on those propositions he rears his whole system, "It goes without saying ..." is a trifle thoughtless. I certainly think he was wrong in not testing more carefully the solidity of his starting point.

In the first place, this limit set to our knowledge of the objects which stimulate our sensations is only accepted without difficulty by well-informed persons; it much astonishes the uninstructed when first explained to them. And this astonishment, although it may seem so, is not a point that can be neglected, for it proves that, in the first and simple state of our knowledge, we believe we directly perceive objects as they are. Now, if we, the cultured class, have, for the most part,^[5] abandoned this primitive belief, we have only done so on certain implicit

conditions, of which we must take cognisance. This is what I shall now demonstrate as clearly as I can.

Take the case of an unlearned person. To prove to him that he knows sensations alone and not the bodies which excite them, a very striking argument may be employed which requires no subtle reasoning and which appeals to his observation. This is to inform him, supposing he is not aware of the fact, that, every time he has the perception of an exterior object, there is something interposed between the object and himself, and that that something is his nervous system.

If we were not acquainted with the existence of our nervous system, we should unhesitatingly admit that our perception of objects consisted in some sort of motion towards the places in which they were fixed. Now, a number of experiments prove to us that objects are known to us as excitants of our nervous system which only act on this system by entering into communication, or coming into contact with, its terminal extremities. They then produce, in the interior of this system, a peculiar modification which we are not yet able to define. It is this modification which follows the course of the nerves and is carried to the central parts of the system. The speed of the propagation of this nerve modification has been measured by certain precise experiments in psychometry; the journey is made slowly, at the rate of 20 to 30 metres per second, and it is of interest that this rate of speed lets us know at what moment and, consequently, by what organic excitement, the phenomenon of consciousness is produced. This happens when the cerebral centres are affected; the phenomenon of consciousness is therefore posterior to the fact of the physical excitement.

I believe it has required a long series of accepted observations for us to have arrived at this idea, now so natural in appearance, that the modifications produced within our nervous system are the only states of which we can have a direct consciousness; and as experimental demonstration is always limited, there can be no absolute certainty that things never happen otherwise, that we never go outside ourselves, and that neither our consciousness nor our nervous influx can exteriorise itself, shoot beyond our material organs, and travel afar in pursuit of objects in order to know or to modify them.

Before going further, we must make our terminology more precise. We have just seen the necessity of drawing a distinction between the sensations of which we

are conscious and the unknown cause which produces these sensations by acting on our nervous systems. This exciting cause I have several times termed, in order to be understood, the external object. But under the name of external object are currently designated groups of sensations, such as those which make up for us a chair, a tree, an animal, or any kind of body. I see a dog pass in the street. I call this dog an external object; but, as this dog is formed, for me who am looking at it, of my sensations, and as these sensations are states of my nervous centres, it happens that the term external object has two meanings. Sometimes it designates our sensations; at another, the exciting cause of our sensations. To avoid all confusion we will call this exciting cause, which is unknown to us, the *X* of matter.

It is, however, not entirely unknown, for we at least know two facts with regard to it. We know, first, that this *X* exists, and in the second place, that its image must not be sought in the sensations it excites in us. How can we doubt, we say, that it exists? The same external observation proves to us at once that there exists an object distinct from our nerves, and that our nerves separate us from it. I insist on this point, for the reason that some authors, after having unreservedly admitted that our knowledge is confined to sensations, have subsequently been hard put to it to demonstrate the reality of the excitant distinct from the sensations.^[6] Of this we need no demonstration, and the testimony of our senses suffices. We have seen the excitant, and it is like a friend who should pass before us in disguise so well costumed and made up that we can attribute to his real self nothing of what we see of him, but yet we know that it is he.

And, in fact, let us remember what it is that we have argued upon—viz. on an observation. I look at my hand, and I see an object approaching it which gives me a sensation of feeling. I at first say that this object is an excitant. It is pointed out to me that I am in error. This object, which appears to me outside my nervous system, is composed, I am told, of sensations. Be it so, I have the right to answer; but if all that I perceive is sensation, my nervous system itself is a sensation; if it is only that, it is no longer an intermediary between the excitant and myself, and it is the fact that we perceive things as they are. For it to be possible to prove that I perceive, not the object, but that *tertium quid* which is sensation, it has to be admitted that the nervous system is a reality external to sensation and that objects which assume, in relation to it, the rôle of excitants and of which we perceive the existence, are likewise realities external to sensation.

This is what is demonstrated by abstract reasoning, and this reasoning is further supported by a common-sense argument. The outer world cannot be summarised in a few nervous systems suspended like spiders in empty space. The existence

of a nervous system implies that of a body in which it is lodged. This body must have complicated organs; its limbs presuppose the soil on which the animal rests, its lungs the existence of oxygen vivifying its blood, its digestive tube, aliments which it digests and assimilates to its substance, and so on. We may indeed admit that this outer world is not, in itself, exactly as we perceive it; but we are compelled to recognise that it exists by the same right as the nervous system, in order to put it in its proper place.

The second fact of observation is that the sensations we feel do not give us the true image of the material X which produces them. The modification made in our substance by this force X does not necessarily resemble in its nature the nature of that force. This is an assertion opposed to our natural opinions, and must consequently be demonstrated. It is generally proved by the experiments which reveal what is called "the law of the specific energy of the nerves." This is an important law in physiology discovered by Müller two centuries ago, and consequences of a philosophical order are attached to it. The facts on which this law is based are these. It is observed that, if the sensory nerves are agitated by an excitant which remains constant, the sensations received by the patient differ according to the nerve affected. Thus, the terminals of an electric current applied to the ball of the eye give the sensation of a small luminous spark; to the auditory apparatus, the current causes a crackling sound; to the hand, the sensation of a shock; to the tongue, a metallic flavour. Conversely, excitants wholly different, but affecting the same nerve, give similar sensations; whether a ray of light is projected into the eye, or the eyeball be excited by the pressure of a finger; whether an electric current is directed into the eye, or, by a surgical operation, the optic nerve is severed by a bistoury, the effect is always the same, in the sense that the patient always receives a sensation of light. To sum up, in addition to the natural excitant of our sensory nerves, there are two which can produce the same sensory effects, that is to say, the mechanical and the electrical excitants. Whence it has been concluded that the peculiar nature of the sensation felt depends much less on the nature of the excitant producing it than on that of the sensory organ which collects it, the nerve which propagates it, or the centre which receives it. It would perhaps be going a little too far to affirm that the external object has no kind of resemblance to the sensations it gives us. It is safer to say that we are ignorant of the degree in which the two resemble or differ from each other.

On thinking it over, it will be found that this contains a very great mystery, for this power of distinction (*specificité*) of our nerves is not connected with any detail observable in their structure. It is very probably the receiving centres which are specific. It is owing to them and to their mechanism that we ought to

feel, from the same excitant, a sensation of sound or one of colour, that is to say, impressions which appear, when compared, as the most different in the world. Now, so far as we can make out, the histological structure of our auditory centre is the same as that of our visual centre. Both are a collection of cells diverse in form, multipolar, and maintained by a conjunctive pellicule (*stroma*). The structure of the fibres and cells varies slightly in the motor and sensory regions, but no means have yet been discovered of perceiving a settled difference between the nerve-cells of the optic centre and those of the auditory centre. There should be a difference, as our mind demands it; but our eye fails to note it.

Let us suppose, however, that to-morrow, or several centuries hence, an improved *technique* should show us a material difference between the visual and the auditory neurone. There is no absurdity in this supposition; it is a possible discovery, since it is of the order of material facts. Such a discovery, however, would lead us very far, for what terribly complicates this problem is that we cannot directly know the structure of our nervous system. Though close to us, though, so to speak, inside us, it is not known to us otherwise than is the object we hold in our hands, the ground we tread, or the landscape which forms our horizon.

For us it is but a sensation, a real sensation when we observe it in the dissection of an animal, or the autopsy of one of our own kind; an imaginary and transposed sensation, when we are studying anatomy by means of an anatomical chart; but still a sensation. It is by the intermediary of our nervous system that we have to perceive and imagine what a nervous system is like; consequently we are ignorant as to the modification impressed on our perceptions and imaginations by this intermediary, the nature of which we are unable to grasp.

Therefore, when we attempt to understand the inmost nature of the outer world, we stand before it as before absolute darkness. There probably exists in nature, outside of ourselves, neither colour, odour, force, resistance, space, nor anything that we know as sensation. Light is produced by the excitement of the optic nerve, and it shines only in our brain; as to the excitement itself, there is nothing to prove that it is luminous; outside of us is profound darkness, or even worse, since darkness is the correlation of light. In the same way, all the sonorous excitements which assail us, the creakings of machines, the sounds of nature, the words and cries of our fellows are produced by excitements of our acoustic nerve; it is in our brain that noise is produced, outside there reigns a dead silence. The same may be said of all our other senses.

Not one of our senses, absolutely none, is the revealer of external reality. From this point of view there is no higher and no lower sense. The sensations of sight, apparently so objective and so searching, no more take us out of ourselves than do the sensations of taste which are localised in the tongue.

In short, our nervous system, which enables us to communicate with objects, prevents us, on the other hand, from knowing their nature. It is an organ of relation with the outer world; it is also, for us, a cause of isolation. We never go outside ourselves. We are walled in. And all we can say of matter and of the outer world is, that it is revealed to us solely by the sensations it affords us, that it is the unknown cause of our sensations, the inaccessible excitant of our organs of the senses, and that the ideas we are able to form as to the nature and the properties of that excitant, are necessarily derived from our sensations, and are subjective to the same degree as those sensations themselves.

But we must make haste to add that this point of view is the one which is reached when we regard the relations of sensation with its unknown cause the great *X* of matter.^[7] Positive science and practical life do not take for an objective this relation of sensation with the Unknowable; they leave this to metaphysics. They distribute themselves over the study of sensation and examine the reciprocal relations of sensations with sensations. Those last, condemned as misleading appearances when we seek in them the expression of the Unknowable, lose this illusory character when we consider them in their reciprocal relations. Then they constitute for us reality, the whole of reality and the only object of human knowledge. The world is but an assembly of present, past, and possible sensations; the affair of science is to analyse and co-ordinate them by separating their accidental from their constant relations.

FOOTNOTES:

[3] *Connaissance*.—The word cognition is used throughout as the English equivalent of this, except in places where the context shows that it means acquaintance merely.—ED.

[4] J. S. MILL, *An Examination of Sir Wm. Hamilton's Philosophy*, pp. 5 and 6. London. 1865.

[5] A few subtle philosophers have returned to it, as I shall show later in chapter iv.

[6] Thus, the perplexity in which John Stuart Mill finds himself is very curious. Having admitted unreservedly that our knowledge is confined to sensations, he is powerless to set up a reality outside this, and acknowledges that the principle of causality cannot legitimately be used to prove that our sensations have a cause which is not a sensation, because this principle cannot be applied outside the world of phenomena.

[7] See p. 18, *sup.*—ED.

CHAPTER III

THE MECHANICAL THEORIES OF MATTER ARE ONLY SYMBOLS

If we keep firmly in mind the preceding conclusion—a conclusion which is neither exclusively my own, nor very new—we shall find a certain satisfaction in watching the discussions of physicists on the essence of matter, on the nature of force and of energy, and on the relations of ponderable and imponderable matter. We all know how hot is the fight raging on this question. At the present time it is increasing in intensity, in consequence of the disturbance imported into existing theories by the new discoveries of radio-activity.[8] We psychologists can look on very calmly at these discussions, with that selfish pleasure we unavowedly feel when we see people fighting while ourselves safe from knocks. We have, in fact, the feeling that, come what may from the discussions on the essence of matter, there can be no going beyond the truth that matter is an excitant of our nervous system, and is only known in connection with, the perception we have of this last.

If we open a work on physics or physiology we shall note with astonishment how the above considerations are misunderstood. Observers of nature who seek, and rightly, to give the maximum of exactness to their observations, show that they are obsessed by one constant prejudice: they mistrust sensation.

A great part of their efforts consists, by what they say, in reducing the rôle of sensation to its fitting part in science; and the invention of mechanical aids to observation is constantly held up as a means of remedying the imperfection of our senses. In physics the thermometer replaces the sensation of heat that our skin—our hand, for example—experiences by the measurable elevation of a column of mercury, and the scale-pan of a precise balance takes the place of the vague sensation of trifling weights; in physiology a registering apparatus replaces the sensation of the pulse which the doctor feels with the end of his forefinger by a line on paper traced with

indelible ink, of which the duration and the intensity, as well as the varied combinations of these two elements, can be measured line by line.

Learned men who pride themselves on their philosophical attainments vaunt in very eloquent words the superiority of the physical instrument over mere sensation. Evidently, however, the earnestness of this eulogy leads them astray. The most perfect registering apparatus must, in the long-run, after its most scientific operations, address itself to our senses and produce in us some small sensation. The reading of the height reached by the column of mercury in a thermometer when heated is accomplished by a visual sensation, and it is by the sight that the movements of the balance are controlled; and that the traces of the sphygmograph are analysed. We may readily admit to physicists and physiologists all the advantages of these apparatus. This is not the question. It simply proves that there are sensations and sensations, and that certain of these are better and more precise than others. The visual sensation of relation in space seems to be *par excellence* the scientific sensation which it is sought to substitute for all the rest. But, after all, it is but a sensation.

Let us recognise that there is, in all this contempt on the part of physicists for sensation, only differences in language, and that a paraphrase would suffice to correct them without leaving any trace. Be it so. But something graver remains. When one is convinced that our knowledge of the outer world is limited to sensations, we can no longer understand how it is possible to give oneself up, as physicists do, to speculations upon the constitution of matter.

Up to the present there have been three principal ways of explaining the physical phenomena of the universe. The first, the most abstract, and the furthest from reality, is above all verbal. It consists in the use of formulas in which the quality of the phenomena is replaced by their magnitude, in which this magnitude, ascertained by the most precise processes of measurement, becomes the object of abstract reasoning which allows its modifications to be foreseen under given experimental conditions. This is pure mathematics, a formal science depending upon logic. Another conception, less restricted than the above, and of fairly recent date, consists in treating all manifestations of nature as forms of energy. This term "energy" has a very vague content. At the most it expresses but two things:

first, it is based on a faint recollection of muscular force, and it reminds one dimly of the sensation experienced when clenching the fists; and, secondly, it betrays a kind of very natural respect for the forces of nature which, in all the images man has made of them, constantly appear superior to his own. We may say "the energy of nature;" but we should never say, what would be experimentally correct; "the weakness of nature." The word "weakness" we reserve for ourselves. Apart from these undecided suggestions, the term energy is quite the proper term to designate phenomena, the intimate nature of which we do not seek to penetrate, but of which we only wish to ascertain the laws and measure the degrees.

A third conception, more imaginative and bolder than the others, is the mechanical or kinetic theory. This last absolutely desires that we should represent to ourselves, that we should imagine, how phenomena really take place; and in seeking for the property of nature the most clearly perceived, the easiest to define and analyse, and the most apt to lend itself to measurement and calculation, it has chosen motion. Consequently all the properties of matter have been reduced to this one, and in spite of the apparent contradiction of our senses, it has been supposed that the most varied phenomena are produced, in the last resort, by the displacement of material particles. Thus, sound, light, heat, electricity, and even the nervous influx would be due to vibratory movements, varying only by their direction and their periods, and all nature is thus explained as a problem of animated geometry. This last theory, which has proved very fertile in explanations of the most delicate phenomena of sound and light, has so strongly impressed many minds that it has led them to declare that the explanation of phenomena by the laws of mechanics alone has the character of a scientific explanation. Even recently, it seemed heresy to combat these ideas.

Still more recently, however, a revulsion of opinion has taken place. Against the physicists, the mathematicians in particular have risen up, and taking their stand on science, have demonstrated that all the mechanisms invented have crowds of defects. First, in each particular case, there is such a complication that that which is defined is much more simple than the definition; then there is such a want of unity that quite special mechanisms adapted to each phenomenal detail have to be imagined; and, lastly—most serious argument of all—so much comprehensiveness and suppleness is

employed, that no experimental law is found which cannot be understood mechanically, and no fact of observation which shows an error in the mechanical explanation—a sure proof that this mode of explanation has no meaning.

My way of combating the mechanical theory starts from a totally different point of view. Psychology has every right to say a few words here, as upon the value of every kind of scientific theory; for it is acquainted with the nature of the mental needs of which these theories are the expression and which these theories seek to satisfy. It has not yet been sufficiently noticed that psychology does not allow itself to be confined, like physics or sociology, within the logical table of human knowledge, for it has, by a unique privilege, a right of supervision over the other sciences. We shall see that the psychological discussion of mechanics has a wider range than that of the mathematicians.

Since our cognition cannot go beyond sensation, shall we first recall what meaning can be given to an explanation of the inmost nature of matter? It can only be an artifice, a symbol, or a process convenient for classification in order to combine the very different qualities of things in one unifying synthesis—a process having nearly the same theoretical value as a *memoria technica*, which, by substituting letters for figures, helps us to retain the latter in our minds. This does not mean that figures are, in fact, letters, but it is a conventional substitution which has a practical advantage. What *memoria technica* is to the ordinary memory, the theory of mechanics should be for our needed unification.

Unfortunately, this is not so. The excuse we are trying to make for the mechanicians is illusory. There is no mistaking their ambition, Notwithstanding the prudence of some and the equivocations in which others have rejoiced, they have drawn their definition in the absolute and not in the relative. To take their conceptions literally, they have thought the movement of matter to be something existing outside our eye, our hands, and our sense; in a word, something *noumenal*, as Kant would have said. The proof that this is their real idea, is that movement is presented to us as the true outer and explanatory cause of our sensations, the external excitement to our nerves. The most elementary works on physics are impregnated with this disconcerting conception. If we open a description of

acoustics, we read that sound and noise are subjective states which have no reality outside our auditory apparatus; that they are sensations produced by an external cause, which is the vibratory movement of sonorous bodies—whence the conclusion that this vibratory movement is not itself a sensation. Or, shall we take another proof, still more convincing. This is the vibratory and silent movement which is invoked by physicists to explain the peculiarities of subjective sensation; so that the interferences, the pulsations of sound, and, in fine, the whole physiology of the ear, is treated as a problem in kinematics, and is explained by the composition of movements.

What kind of reality do physicists then allow to the displacements of matter? Where do they place them, since they recognise otherwise that the essence of matter is unknown to us? Are we to suppose that, outside the world of *noumena*, outside the world of phenomena and sensations, there exists a third world, an intermediary between the two former, the world of atoms and that of mechanics?

A short examination will, moreover, suffice to show of what this mechanical model is formed which is presented to us as constituting the essence of matter. This can be nothing else than the sensations, since we are incapable of perceiving or imagining anything else. It is the sensations of sight, of touch, and even of the muscular sense. Motion is a fact seen by the eye, felt by the hand; it enters into us by the perception we have of the solid masses visible to the naked eye which exist in our field of observation, of their movements and their equilibrium and the displacement we ourselves effect with our bodies. Here is the sensory origin, very humble and very gross, of all the mechanics of the atoms. Here is the stuff of which our lofty conception is formed. Our mind can, it is true, by a work of purification, strip movement of most of its concrete qualities, separate it even from the perception of the object in motion, and make of it a something or other ideal and diagrammatic; but there will still remain a residuum of visual, tactile, and muscular sensations, and consequently it is still nothing else than a subjective state, bound to the structure of our organs. We are, for the rest, so wrapped up in sensations that none of our boldest conceptions can break through the circle.

But it is not the notion of movement alone which proceeds from sensation. There is also that of exteriority, of space, of position, and, by opposition,

that of external or psychological events. Without declaring it to be certain, I will remind you that it is infinitely probable that these notions are derived from our muscular experience. Free motion, arrested motion, the effort, the speed, and the direction of motion, such are the sensorial elements, which, in all probability, constitute the foundation of our ideas on space and its properties. And those are so many subjective notions which we have no right to treat as objects belonging to the outer world.

What is more remarkable, also, is that even the ideas of object, of body, and of matter, are derived from visual and tactile sensations which have been illegitimately set up as entities. We have come, in fact, to consider matter as a being separate from sensations, superior to our sensations, distinct from the properties which enable us to know it, and binding together these properties, as it were, in a sheaf. Here again is a conception at the base of visualisation and muscularisation; it consists in referring to the visual and other sensations, raised for the occasion to the dignity of external and permanent causes, the other sensations which are considered as the effects of the first named upon our organs of sense.

It demands a great effort to clear our minds of these familiar conceptions which, it is plain are nothing but naïve realism. Yes! the mechanical conception of the universe is nothing but naïve realism.

To recapitulate our idea, and, to make it more plain by an illustration, here is a tuning-fork on the table before me. With a vigorous stroke of the bow I set it vibrating. The two prongs separate, oscillate rapidly, and a sound of a certain tone is heard. I connect this tuning-fork, by means of electric wires, with a Déprez recording apparatus which records the vibrations on the blackened surface of a revolving cylinder; and we can thus, by an examination of the trace made under our eyes, ascertain all the details of the movement which animates it. We see, parallel to each other, two different orders of phenomena; the visual phenomena which show us that the tuning-fork is vibrating, and the auditory phenomena which convey to us the fact that it is making a sound.

The physicist, asked for an explanation of all this, will answer: "It is the vibration of the tuning-fork which, transmitted by the air, is carried to our auditory apparatus, causes a vibration in the tympanum, the movements of

which are communicated to the small bones of the middle ear, thence (abridging details) to the terminations of the auditory nerve, and so produces in us the subjective sensation of sound." Well, in so saying, the physicist commits an error of interpretation; outside our ears there exists something we do not know which excites them; this something cannot be the vibratory movement of the tuning-fork, for this vibratory movement which we can see is likewise a subjective sensation; it no more exists outside our sight than sound exists outside our ears. In any case, it is as absurd to explain a sensation of sound by one of sight, as a sensation of sight by one of sound.

One would be neither further from nor nearer to the truth if we answered that physicist as follows: "You give the preponderance to your eye; I myself give it to my ear. This tuning-fork appears to you to vibrate. Wrong! This is how the thing occurs. This tuning-fork produces a sound which, by exciting our retina, gives us a sense of movement. This visual sensation of vibration is a purely subjective one, the external cause of the phenomenon is the sound. The outer world is a concert of sounds which rises in the immensity of space. Matter is noise and nothingness is silence."

This theory of the above experiment is not absurd; but, as a matter of fact, it is probable that no one would or could accept it, except verbally for amusement, as a challenge, or for the pleasure of talking metaphysics. The reason is that all our evolution, for causes which would take too long to detail, has established the hegemony of certain of our senses over the others. We have, above all, become visual and manual beings. It is the eye and the hand which give us the perceptions of the outer world of which we almost exclusively make use in our sciences; and we are now almost incapable of representing to ourselves the foundation of phenomena otherwise than by means of these organs. Thus all the preceding experiment from the stroke of the bow to the final noise presents itself to us in visual terms, and further, these terms are not confined to a series of detached sensations.

Visual sensation combines with the tactile and muscular sensations, and forms sensorial constructions which succeed each, other, continue, and arrange themselves logically: in lieu of sensations, there are objects and relations of space between these objects, and the actions which connect

them, and the phenomena which pass from one to the other. All that is only sensation, if you will; but merely as the agglutinated molecules of cement and of stone are a palace.

Thus the whole series of visual events which compose our experiment with the tuning-fork can be coherently explained. One understands that It is the movement of my hand equipped with the bow which is communicated to the tuning-fork. One understands that this movement passing into the fork has changed its form and rhythm, that the waves produced by the fork transmit themselves, by the oscillations of the air-molecules, to our tympanum, and so on. There is in all this series of experiments an admirable continuity which fully satisfies our minds. However much we might be convinced by the theoretical reasons given above, that we have quite as much right to represent the same series of events in an auditory form, we should be incapable of realising that form to ourselves.

What would be the structure of the ear to any one who only knew it through the sense of hearing? What would become of the tympanum, the small bones, the cochlea, and the terminations of the acoustic nerve, if it were only permitted to represent them in the language of sound? It is very difficult to imagine.

Since, however, we are theorising, let us not be stopped by a few difficulties of comprehension. Perhaps a little training might enable us to overcome them. Perhaps musicians, who discern as much reality in what one hears as in what one sees, would be more apt than other folk to understand the necessary transposition. Some of them, in their autobiographies, have made, by the way, very suggestive remarks on the importance they attribute to sound: and, moreover, the musical world, with its notes, its intervals, and its orchestration, lives and develops in a manner totally independent of vibration.

Perhaps we can here quote one or two examples which may give us a lead. To measure the length of a body instead of applying to it a yard-wand, one might listen to its sound; for the pitch of the sound given by two cords allows us to deduce their difference of length, and even the absolute length of each. The chemical composition of a body might be noted by its electric resistance and the latter verified by the telephone; that is to say, by the ear.

Or, to take a more subtle example. We might make calculations with sounds of which we have studied the harmonic relations as we do nowadays with figures. A sum in rule of three might even be solved sonorously; for, given three sounds, the ear can find a fourth which should have the same relation to the third as the second to the first. Every musical ear performs this operation easily; now, this fourth sound, what else is it but the fourth term in a rule of three? And by taking into consideration the number of its vibrations a numerical solution would be found to the problem. This novel form of calculating machine might serve to fix the price of woollen stuffs, to calculate brokerages and percentages, and the solution would be obtained without the aid of figures, without calculation, without visualisation, and by the ear alone.

By following up this idea, also, we might go a little further. We might arrive at the conviction that our present science is human, petty, and contingent; that it is closely linked with the structure of our sensory organs; that this structure results from the evolution which fashioned these organs; that this evolution has been an accident of history; that in the future it may be different; and that, consequently, by the side or in the stead of our modern science, the work of our eyes and hands—and also of our words—there might have been constituted, there may still be constituted, sciences entirely and extraordinarily new—auditory, olfactory, and gustatory sciences, and even others derived from other kinds of sensations which we can neither foresee nor conceive because they are not, for the moment, differentiated in us. Outside the matter we know, a very special matter fashioned of vision and touch, there may exist other matter with totally different properties.

But let us bring our dream to an end. The interest of our discussion does not lie in the hypothetical substitution of hearing or any other sense for sight. It lies in the complete suppression of all explanation of the noumenal object in terms borrowed from the language of sensation. And that is our last word. We must, by setting aside the mechanical theory, free ourselves from a too narrow conception of the constitution of matter. And this liberation will be to us a great advantage which we shall soon reap. We shall avoid the error of believing that mechanics is the only real thing and that all that cannot be explained by mechanics must be incomprehensible. We shall then gain more liberty of mind for understanding what the union of the soul with the body^[9] may be.

FOOTNOTES:

[8] I would draw attention to a recent volume by GUSTAVE LE BON, on *Evolution de la Matière*, a work full of original and bold ideas.

[9] See [Note 1] on p. 3 .—ED.

CHAPTER IV

ANSWERS TO SOME OBJECTIONS, AND SUMMARY

I have set forth the foregoing ideas by taking the road which to me seemed the best. On reflection it has occurred to me that my manner of exposition and demonstration may be criticised much more than my conclusion. Now, as it is the conclusion alone which here is of importance, it is expedient not to make it responsible for the arguments by which I have supported it.

These arguments resolve themselves into the attestation that between objects and our consciousness there exists an intermediary, our nervous system. We have even established that the existence of this intermediary is directly proved by observation, and from this I have concluded that we do not directly perceive the object itself but a *tertium quid*, which is our sensations.

Several objections to this might be made. Let us enumerate them.

1. It is not inconceivable that objects may act directly on our consciousness without taking the intermediary of our nervous system. Some authors, the spiritualists notably, believe in the possibility of disembodied souls, and they admit by implication that these souls remain in communication with the terrestrial world, witness our actions, and hear our speech. Since they no longer have organs of sense, we must suppose that these wandering souls, if they exist, can directly perceive material objects. It is evident that such hypotheses have, up till now, nothing scientific in them, and that the demonstrations of them which are given raise a feeling of scepticism more than anything else. Nevertheless, we have not the right to exclude, by *a priori* argument, the possibility of this category of phenomena.

2. Several German authors have maintained in recent years, that if the nervous system intervenes in the perception of external objects, it is a faithful intermediary which should not work any change on those physical actions which it gathers from outside to transmit to our consciousness. From this, point of view colour would exist as colour, outside our eyes,

sound would exist as sound, and in a general way there would not be, in matter, any mysterious property left, since we should perceive matter as it is. This is a very unexpected interpretation, by which men of science have come to acknowledge the correctness of the common belief: they rehabilitate an opinion which philosophers have till now turned to ridicule, under the name of naïve realism. All which proves that the naïveté of some may be the excessive refinement of others.

To establish scientifically this opinion they batter down the theory of the specific energy of the nerves. I have recalled in a previous page^[10] of what this theory consists. I have shown that if, by mechanical or electrical means, our different sensory nerves are excited, notwithstanding the identity of the excitant, a different sensation is provoked in each case—light when the optic nerve is stimulated, sound when the acoustic, and so on. It is now answered to this argument based on fact that the nature of these excitants must be complex. It is not impossible, it is thought, that the electric force contains within itself both luminous and sonorous actions; it is not impossible that a mechanical excitement should change the electric state of the nerve affected, and that, consequently, these subsidiary effects explain how one and the same agent may, according to the nerves employed, produce different effects.

3. After the spiritualists and the experimentalists, let us take the metaphysicians. Among them one has always met with the most varying specimens of opinions and with arguments for and against all possible theories.

Thus it is, for example, with the external perception. Some have supposed it indirect, others, on the contrary, that it acts directly on the object. Those who uphold the direct theory are inspired by Berkeley, who asserts that the sensitive qualities of the body have no existence but in our own minds, and consist really in representative ideas. This doctrine is expressly based on this argument—that thought differs too much in nature from matter for one to be able to suppose any link between these two substances. In this particular, some authors often make an assertion without endeavouring to prove it. They are satisfied with attesting, or even with supposing, that mind can have no consciousness of anything but its own states. Other philosophers, as I have said, maintain that "things which have a real

existence are the very things we perceive." It is Thomas Reid who has upheld, in some passages of his writings at all events, the theory of instantaneous perception, or intuition. It has also been defended by Hamilton in a more explicit manner.^[11] It has been taken up again in recent years, by a profound and subtle philosopher, M. Bergson, who, unable to admit that the nervous system is a *substratum of knowledge* and serves us as a percipient, takes it to be solely a motor organ, and urges that the sensory parts of the system—that is to say, the centripetal, optic, acoustic, &c., nerves—do not call forth, when excited, any kind of sensation, their sole purpose being to convey disturbances from periphery to periphery, or, say, from external objects to the muscles of the body. This hypothesis, surely a little difficult to comprehend, places, if I mistake not, the mind, as a power of perception and representation, within the interval comprised between the external object and the body, so that the mind is in direct contact with external objects and knows them as they are.

It will be noticed that these three interpretations, the spiritualistic, the experimental, and the metaphysical, are in formal opposition with that which I have set forth earlier in these pages. They deny the supposition that the nervous system serves us as an intermediary with nature, and that it transforms nature before bringing it to our consciousness. And it might seem that by contradicting my fundamental proposition, those three new hypotheses must lead to a totally different conclusion.

Now, this is not so at all. The conclusion I have enunciated remains entirely sound, notwithstanding this change in the starting point, and for the following reason. It is easy to see that we cannot represent to ourselves the inner structure of matter by using all our sensations without distinction, because it is impossible to bring all these sensations within one single and identical synthetic construction: for this they are too dissimilar. Thus, we should try in vain to unite in any kind of scheme a movement of molecules and an odour; these elements are so heterogeneous that there is no way of joining them together and combining them.

The physicists have more or less consciously perceived this, and, not being able to overcome by a frontal attack the difficulty created by the heterogeneity of our sensations, they have turned its flank. The ingenious artifice they have devised consists in retaining only some of these

sensations, and in rejecting the remainder; the first being considered as really representing the essence of matter, and the latter as the effects of the former on our organs of sense; the first being reputed to be true, we may say, and the second being reputed false—that is subjective, that is not representing the *X* of matter.[12] I have refuted this argument by showing that all our sensations without exception are subjective and equally false in regard to the *X* of matter, and that no one of them, consequently, has any claim to explain the others.

Now, by a new interpretation; we are taught that all sensations are equally true, and that all faithfully represent the great *X*. If they be all equally true, it is absolutely the same as if they were all false; no one sensation can have any privilege over the others, none can be truer than the others, none can be capable of explaining the others, none can usurp to itself the sole right of representing the essence of matter; and we thus find ourselves, in this case, as in the preceding, in presence of the insurmountable difficulty of creating a synthesis with heterogeneous elements.

All that has been said above is summed up in the following points:—

1. Of the external world, we only know our sensations. All the physical properties of matter resolve themselves for us into sensations, present, past, or possible. We may not say that it is by the intermediary, by the means of sensation, that we know these properties, for that would mean that the properties are distinct from the sensations. Objects are to us in reality only aggregates of sensations.

2. The sensations belong to the different organs of the senses—sight, hearing, touch, the muscular sense, &c. Whatever be the sense affected, one sensation has the same rights as the others, from the point of view of the cognition of external objects. It is impossible to distinguish them into subjective and objective, by giving to this distinction the meaning that certain sensations represent objects as they are, while certain others simply represent our manner of feeling. This is an illegitimate distinction, since all sensations have the same physiological condition, the excitement of a sensory nerve, and result from the properties of this nerve when stimulated.

3. Consequently, it is impossible for us to form a conception of matter in terms of movement, and to explain by the modalities of movement the

properties of bodies; for this theory amounts to giving to certain sensations, especially those of the muscular sense, the hegemony over the others. We cannot explain, we have not the right to explain, one sensation by another, and the mechanical theory of matter has simply the value of a symbol.

FOOTNOTES:

[10] See p. 22, *sup.*—ED.

[11] See J. S. MILL'S *Examination of Sir Wm. Hamilton's Philosophy*, chap. x. p. 176, *et. seq.*

[12] See p. 18, *sup.*—ED.

BOOK II

THE DEFINITION OF MIND

CHAPTER I

THE DISTINCTION BETWEEN COGNITION^[13] AND ITS OBJECT

After having thus studied matter and reduced it to sensations, we shall apply the same method of analysis to mind, and inquire whether mind possesses any characteristic which allows it to be distinguished from matter.

Before going any further, let me clear up an ambiguity. All the first part of this work has been devoted to the study of what is known to us in and by sensation; and I have taken upon myself, without advancing any kind of justifying reason, to call that which is known to us, by this method, by the name of matter, thus losing sight of the fact that matter only exists by contra-distinction and opposition to mind, and that if mind did not exist, neither would matter. I have thus appeared to prejudge the question to be resolved.

The whole of this terminology must now be considered as having simply a conventional value, and must be set aside for the present. These are the precise terms in which this question presents itself to my mind. A part of the knowable consists in sensations. We must, therefore, without troubling to style this aggregate of sensations *matter* rather than *mind*, make an analysis of the phenomena known by the name of mind, and see whether they differ from the preceding ones. Let us, therefore, make an inventory of mind. By the process of enumeration, we find quoted as psychological phenomena, the sensations, the perceptions, the ideas, the recollections, the reasonings, the emotions, the desires, the imaginations, and the acts of attention and of will. These appear to be, at the first glance, the elements of mind; but, on reflection, one perceives that these elements belong to two distinct categories, of which it is easy to recognise the duality, although, in fact and in reality, these two elements are constantly combined. The first of these elements may receive the generic name of objects of cognition, or objects known, and the second that of acts of cognition.

Here are a few examples of concrete facts, which only require a rapid analysis to make their double nature plain. In a sensation which we feel are two things: a particular state, or an object which one knows, and the act of knowing it, of feeling it, of taking cognisance of it; in other words, every sensation comprises an impression and a cognition. In a recollection there is, in like manner, a certain image of the past and the fact consisting in the taking cognisance of this image. It is, in other terms, the distinction between the intelligence and the object. Similarly, all reasoning has an object; there must be matter on which to reason, whether this matter be supplied by the facts or the ideas. Again, a desire, a volition, an act of reflection, has need of a point of application. One does not will in the air, one wills something; one does not reflect in the void, one reflects over a fact or over some difficulty.

We may then provisionally distinguish in an inventory of the mind a something which is perceived, understood, desired, or willed, and, beyond that, the fact of perceiving, of understanding, or desiring, or of willing.

To illustrate this distinction by an example, I shall say that an analogous separation can be effected in an act of vision, by showing that the act of vision, which is a concrete operation, comprises two distinct elements: the object seen and the eye which sees. But this is, of course, only a rough comparison, of which we shall soon see the imperfections when we are further advanced in the study of the question.

To this activity which exists and manifests itself in the facts of feeling, perceiving, &c., we can give a name in order to identify and recognise it: we will call it the consciousness^[14] (*la conscience*), and we will call object everything which is not the act of consciousness.

After this preliminary distinction, to which we shall often refer, we will go over the principal manifestations of the mind, and we will first study the objects of cognition, reserving for another chapter the study of the acts of cognition—that is to say, of consciousness. We will thus examine successively sensation, idea, emotion, and will.

It has been often maintained that the peculiar property of mind is to perceive sensations. It has also been said that thought—that is, the property of representing to one's self that which does not exist—distinguishes mind

from matter. Lastly, it has not failed to be affirmed that one thing which the mind brings into the material world is its power of emotion; and moralists, choosing somewhat arbitrarily among certain emotions, have said that the mind is the creator of goodness. We will endeavour to analyse these different affirmations.

FOOTNOTES:

[13] See [Note 3], *sup.* on p. 15.—ED.

[14] The word "*conscience*" is one of those which has been used in the greatest number of different meanings. Let it be, at least, understood that *I* use it here in an intellectual and not a moral sense. I do not attach to the conscience the idea of a moral approbation or disapprobation, of a duty, of a remorse. The best example to illustrate conscience has, perhaps, been formed by LADD. It is the contrast between a person awake and sleeping a dreamless sleep. The first has consciousness of a number of things; the latter has consciousness of nothing. Let me now add that we distinguish from consciousness that multitude of things of which one has consciousness of. Of these we make the object of consciousness. [*Conscience* has throughout been rendered "consciousness."—ED.]

CHAPTER II

DEFINITION OF SENSATION

When making the analysis of matter we impliedly admitted two propositions: first, that sensation is the *tertium quid* which is interposed between the excitant of our sensory nerves and ourselves; secondly, that the aggregate of our sensations is all we can know of the outer world, so that it is correct to define this last as the collection of our present, past, and possible sensations. It is not claimed that the outer world is nothing else than this, but it is claimed with good reason that the outer world is nothing else *to us*.

It would be possible to draw from the above considerations a clear definition of sensation, and especially it would be possible to decide henceforth from the foregoing whether sensation is a physical or a mental phenomenon, and whether it belongs to matter or to mind. This is the important point, the one which we now state, and which we will endeavour to resolve. To make the question clearer, we will begin it afresh, as if it were new, and as if the facts hitherto analysed did not already prejudge the solution. Let us begin by giving a definition of sensation from the point of view of experimental psychology.

Sensation, then, is the phenomenon which is produced and which one experiences when an excitant has just acted on one of our organs of sense. This phenomenon is therefore composed of two parts: an action exercised from outside by some body or other on our nervous substance; and, then, the fact of feeling this action.

This fact of feeling, this state of consciousness, is necessary to constitute sensation; when it does not exist, it is preferable to give the phenomenon another name, otherwise the fault is committed of mixing up separate facts. Physiologists have, on this point, some faults of terminology with which to reproach themselves: for they have employed the word sensibility with too little of the critical spirit. Sensibility, being capacity for sensation,

presupposes, like sensation itself, consciousness. It has, therefore, been wrong, in physiology, to speak of the sensibility of the tissues and organs, which, like the vegetable tissues or the animal organs of vegetative life, properly speaking, feel nothing, but react by rapid or slow movements to the excitements they are made to receive. Reaction, by a movement or any kind of modification, to an excitement, does not constitute a sensation unless consciousness is joined with it, and, consequently, it would be wiser to give unfelt excitements and reactions the name of excitability.

The clearest examples of sensation are furnished by the study of man, and are taken from cases where we perceive an external object. The object produces upon us an action, and this action is felt; only, in such cases, the fact of sensation comprises but a very small part of the event. It only corresponds, by definition, to the actual action of the object. Analysis after analysis has shown that we constantly perceive far beyond this actual action of objects. Our mind, as we say, outruns our senses. To our sensations, images come to attach themselves which result from sensations anteriorly felt in analogous circumstances. These images produce in us an illusion, and we take them for sensations, so that we think we perceive something which is but a remembrance or an idea; the reason being that our mind cannot remain in action in the presence of a sensation, but unceasingly labours to throw light upon it, to sound it, and to arrive at its meaning, and consequently alters it by adding to it. This addition is so constant, so unavoidable, that the existence of an isolated sensation which should be perceived without the attachment of images, without modification or interpretation, is well-nigh unrealisable in the consciousness of an adult. It is a myth.

Let us, however, imagine this isolation to be possible, and that we have before us a sensation free from any other element. What is this sensation? Does it belong to the domain of physical or of moral things? Is it a state of matter or of mind?

I can neither doubt nor dispute that sensation is, in part, a psychological phenomenon, since I have admitted, by the very definition I have given of it, that sensation implies consciousness. We must, therefore, acknowledge those who define it as *a state of consciousness* to be right, but it would be more correct to call it the *consciousness of a state*, and it is with regard to

the nature of this state that the question presents itself. It is only this state which we will now take into consideration. It is understood that sensation contains both an impression and a cognition. Let us leave till later the study of the act of cognition, and deal with the impression. Is this impression now of a physical or a mental nature? Both the two opposing opinions have been upheld. In this there is nothing astonishing, for in metaphysics one finds the expression of every possible opinion. But a large, an immense majority of philosophers has declared in favour of the psychological nature of the impression. Without even making the above distinction between the impression and the act of cognition, it has been admitted that the entire sensation, taken *en bloc*, is a psychological phenomenon, a modification of our consciousness and a peculiar state of our minds. Descartes has even employed this very explicit formula: "The objects we perceive are within our understanding." It is curious to see how little trouble authors take to demonstrate this opinion; they declare it to be self-evident, which is a convenient way of avoiding all proof. John Stuart Mill has no hesitation in affirming that: "The mind, in perceiving external objects, can only take notice of its own conditions." And Renouvier expresses the same arbitrary assertion with greater obscurity when he writes: "The monad is constituted by this relation: the connection of the subject with the object within the subject."^[15] In other words, it is laid down as an uncontrovertible principle that "the mental can only enter into direct relations with the mental." That is what may be called "the principle of Idealism."

This principle seems to me very disputable, and it is to me an astonishing thing that the most resolute of sceptics—Hume, for example—should have accepted it without hesitation. I shall first enunciate my personal opinion, then make known another which only differs from mine by a difference of words, and finally I will discuss a third opinion, which seems to me radically wrong.

My personal opinion is that sensation is of a mixed nature. It is psychical in so far as it implies an act of consciousness, and physical otherwise. The impression on which the act of cognition operates, that impression which is directly produced by the excitant of the nervous system, seems to me, without any doubt, to be of an entirely physical nature. This opinion, which I make mine own, has only been upheld by very few philosophers—

Thomas Reid perhaps, and William Hamilton for certain; but neither has perceived its deep-lying consequences.

What are the arguments on which I rely? They are of different orders, and are arguments of fact and arguments of logic. I shall first appeal to the natural conviction of those who have never ventured into metaphysics. So long as no endeavour has been made to demonstrate the contrary to them, they believe, with a natural and naïve belief, that matter is that which is seen, touched and felt, and that, consequently, matter and our senses are confounded. They would be greatly astonished to be informed that when we appear to perceive the outer world, we simply perceive our ideas; that when we take the train for Lyons we enter into one state of consciousness in order to attain another state of consciousness.

Now, the adherents of this natural and naïve opinion have, as they say in the law, the right of possession (*possession d'état*); they are not plaintiffs but defendants; it is not for them to prove they are in the right, it has to be proved against them that they are in the wrong. Until this proof is forthcoming they have a presumption in their favour.

Are we here making use of the argument of common opinion of mankind, of which ancient philosophy made so evident an abuse? Yes, and no. Yes, for we here adopt the general opinion. No, for we only adopt it till the contrary be proved. But who can exhibit this proof to the contrary? On a close examination of the question, it will be perceived that sensation, taken as an object of cognition, becomes confused with the properties of physical nature, and is identified with them, both by its mode of apparition and by its content. By its mode of apparition, sensation holds itself out as independent of us, for it is at every instant an unexpected revelation, a source of fresh cognitions, and it offers a development which takes place without and in spite of our will; while its laws of co-existence and of succession declare to us the order and march of the material universe. Besides, by its content, sensation is confounded with matter. When a philosopher seeks to represent to himself the properties of a material object,—of a brain, for example—in order to contrast them with the properties of a psychical activity, it is the properties of sensation that he describes as material; and, in fact, it is by sensation, and sensation alone, that we know these properties. Sensation is so little distinct from them that it is an error to consider it as a means, a

process, an instrument for the knowledge of matter. All that we know of matter is not known in or by sensation, but constitutes sensation itself; it is not by the aid of sensation that we know colour; colour is a sensation, and the same may be said of form, resistance, and the whole series of the properties of matter. They are only our sensations clothed with external bodies. It is therefore absolutely legitimate to consider a part of our sensations, the object part, as being of physical nature. This is the opinion to which I adhere.

We come to the second opinion we have formulated. It is, in appearance at least, very different from the first. Its supporters agree that the entire sensation, taken *en bloc* and unanalysed, is to be termed a psychological phenomenon. In this case, the act of consciousness, included in the sensation, continues to represent a psychical element. They suppose, besides, that the object on which this act operates is psychical; and finally, they suppose that this object or this impression was provoked in us by a physical reality which is kept in concealment, which we do not perceive, and which remains unknowable.

This opinion is nowise absurd in itself: but let us examine its consequences. If we admit this thesis, that sensations are manifestations of mind which, although provoked by material causes, are of a purely mental nature, we are forced to the conclusion that we know none of the properties of material bodies, since we do not enter into relations with these bodies. The object we apprehend by perception is, according to this hypothesis, solely mental. To draw therefrom any notion on material objects, it would have to be supposed that, by some mysterious action, the mental which we know resembles the physical which we do not know, that it retains the reflection of it, or even that it allows its colour and form to pass, like a transparent pellicle applied on the contour of bodies. Here are hypotheses very odd in their realism. Unless we accept them, how is it comprehensible that we can know anything whatever of physical nature? We should be forced to acknowledge, following the example of several philosophers, that the perception of the physical is an illusion.

As a compensation, that which this system takes from matter it attributes to mind, which turns our familiar conceptions upside down. The qualities of sensation detached from matter will, when applied to mind, change its

physiognomy. There are sensations of extent, weight, space, and form. If these sensations are turned into psychological events, we shall have to grant to these events, to these manifestations of the mind, the properties of extent, of weight, of form. We shall have to say that mind is a resisting thing, and that it has colour.

It may be said that this fantasy of language is not very serious. So be it. But then what remains of the dualism of mind and matter? It is at least singularly compromised. We may continue to suppose that matter exists, and even that it is matter which provokes in our mind those events which we call our sensations; but we cannot know if by its nature, its essence, this matter differs from that of mind, since we shall be ignorant of all its properties. Our ignorance on this point will be so complete that we shall not even be able to know whether any state which we call mental may not be physical. The distinction between physical and mental will have lost its *raison d'être*, since the existence of the physical is necessary to give a meaning to the existence of the mental. We are brought, whether we like it or not, to an experimental monism, which is neither psychological nor physical; panpsychism and panmaterialism will have the same meaning.[16]

But this monism can be only transitory, for it is more in the words than in the thing itself. It is brought about by the terminology adopted, by the resolution to call mental all the phenomena that it is possible to know. Luckily, our speculations are not at the mercy of such trifling details as the details of language. Whatever names may be given to this or that, it will remain none the less true that nature will continue to present to us a contrast between phenomena which are flints, pieces of iron, clods of earth, brains—and some other phenomena which we call states of consciousness. Whatever be the value of this dualism, it will have to be discussed even in the hypothesis of panpsychism.[17] As for myself, I shall also continue to make a distinction between what I have called objects of cognition and acts of cognition, because this is the most general distinction that can be traced in the immense field of our cognitions. There is no other which succeeds, to the same degree, in dividing this field into two, moreover, this distinction is derived directly from observation, and does not depend for its validity on the physical or mental nature of the objects. Here is, then, a duality, and this duality, even when it does not bear the names physical and moral, should

necessarily play the same part, since it corresponds to the same distinction of fact.

In the end, nothing will be changed, and this second opinion must gradually merge into the one first stated by me, and of which I take the responsibility. We may, therefore, put it out of consideration.

I have mentioned a third opinion, stating that it appeared to me to be radically false. Outwardly it is the same as the last; looked at superficially it seems even confused with it; but, in reality it is of a totally different nature. It supposes that sensation is an entirely psychological phenomenon. Then, having laid down this thesis, it undertakes to demonstrate it by asserting that sensation differs from the physical fact, which amounts to supposing that we cannot know anything but sensations, and that physical facts are known to us directly and by another channel. This is where the contradiction comes in. It is so apparent that one wonders how it has been overlooked by so many excellent minds. In order to remove it, it will be sufficient to recollect that we do not know anything other than sensations; it is therefore impossible to make any distinction between the physical object and the object of cognition contained in every sensation. The line of demarcation between the physical and the moral cannot pass this way, since it would separate facts which are identical.

We can, therefore, only deplore the error of all those who, to express the difference between mind and matter, have sought a contrast between sensation and physical facts. Physiologists, with hardly an exception, have fallen into this error; when contemplating in imagination the material working of the brain, they have thought that between the movement of cerebral matter and sensation there was a gulf fixed. The comparison, to have been correct, required to be presented in quite another way. A parallel, for instance, should have been drawn between a certain cerebral movement and the act of consciousness, and there should have been said: "The cerebral motion is the physical phenomenon, the act of consciousness the psychological." But this distinction has not been made. It is sensation *en bloc* which is compared to the cerebral movement, as witness a few passages I will quote as a matter of curiosity, which are borrowed from philosophers and, especially, from physiologists.

While philosophers take as a principle of idealism, that the mental can only know the mental, physiologists take, as a like principle, the heterogeneity existing, or supposed to exist, between the nerve impression and the sensation. "However much we may follow the excitement through the whole length of the nerve," writes Lotze,^[18] "or cause it to change its form a thousand times and to metamorphose itself into more and more delicate and subtle movements, we shall never succeed in showing that a movement thus produced can, by its very nature, cease to exist as movement and be reborn in the shape of sensation...." It will be seen that it is on the opposition between molecular movement and sensation, that Lotze insists. In like manner Ferrier: "But how is it that the molecular modifications in the cerebral cells coincide with the modifications of the consciousness; how, for instance, do luminous vibrations falling upon the retina excite the modification of consciousness called *visual sensation*? These are problems we cannot solve. We may succeed in determining the exact nature of the molecular changes which take place in the cerebral cells when a sensation is felt, but this will not bring us an inch nearer to the explanation of the fundamental nature of sensation." Finally, Du Bois Reymond, in his famous discussion in 1880, on the seven enigmas of the world, speaks somewhat as follows: "The astronomical knowledge of the encephalon, that is, the most intimate to which we can aspire, only reveals to us matter in motion. But no arrangement nor motion of material particles can act as a bridge by which we can cross over into the domain of intelligence.... What imaginable link is there between certain movements of certain molecules in my brain, on the one hand, and on the other hand primitive, undefinable, undeniable facts such as: I have the sensation of softness, I smell the odour of a rose, I hear the sound of an organ, I see a red colour, &c...."

These three quotations show very conclusively that their authors thought they could establish the heterogeneity of the two phenomena by opposing matter to sensation. It must be recognised that they have fallen into a singular error; for matter, whatever it may be, is for us nothing but sensation; matter in motion, I have often repeated, is only a quite special kind of sensation; the organic matter of the brain, with its whirling movements of atoms, is only sensation. Consequently, to oppose the molecular changes in the brain to the sensation of red, blue, green, or to an undefined sensation of any sort, is not crossing a gulf, and bringing together

things which cannot be compared, it is simply comparing one sensation to another sensation.

There is evidently something equivocal in all this; and I pointed this out when outlining and discussing the different theories of matter. It consists in taking from among the whole body of sensations certain of them which are considered to be special, and which are then invested with the privilege of being more important than the rest and the causes of all the others. This is about as illegitimate as to choose among men a few individuals to whom is attributed the privilege of commanding others by divine right. These privileged sensations which belong to the sight, the touch, and the muscular sense, and which are of large extent, are indeed extensive. They have been unduly considered as objective and as representing matter because they are better known and measurable, while the other sensations, the unextensive sensations of the other senses, are considered as subjective for the reasons that they are less known and less measurable: and they are therefore looked on as connected with our sensibility, our Ego, and are used to form the moral world.

We cannot subscribe to this way of establishing the contrast between matter and thought, since it is simply a contrast between two categories of sensations, and I have already asserted that the partitioning-out of sensations into two groups having different objective values, is arbitrary.

FOOTNOTES:

[15] CH. RENOUVIER et L. PRAT, *La Nouvelle Monadologie*, p. 148.

[16] An American author, MORTON PRINCE, lately remarked this: *Philosophical Review*, July 1904, p. 450.

[17] This FLOURNOY recently has shown very wittily. See in *Arch. de Psychol.*, Nov. 1904, his article on Panpsychism.

[18] This extract, together with the two subsequent, are borrowed from an excellent lecture by FLOURNOY, on *Métaphysique et Physiologie*. Georg: Geneva, 1890.

CHAPTER III

DEFINITION OF THE IMAGE

Going on with our inventory, after sensations come images, ideas, and concepts; in fact, quite a collection of phenomena, which, are generally considered as essentially psychological.

So long as one does not carefully analyse the value of ideas, one remains under the impression that ideas form a world apart, which is sharply distinguished from the physical world, and behaves towards it as an antithesis. For is not conception the contrary of perception? and is not the ideal in opposition to reality?

Thoughts have some characteristics of fancy, of freedom, even of unreality, which are wanting to the prosaicness of heavy material things. Thoughts sport with the relations of time and space; they fly in a moment across the gulf between the most distant objects; they travel back up the course of time; they bring near to us events centuries away; they conceive objects which are unreal; they imagine combinations which upset all physical laws, and, further, these conceptions remain invisible to others as well as to ourselves. They are outside the grip of reality, and constitute a world which becomes, for any one with the smallest imagination, as great and as important as the world called real. One may call in evidence the poets, novelists, artists, and the dreamers of all kinds. When life becomes too hard for us, we fly to the ideal world, there to seek forgetfulness or compensation.

It is, therefore, easy to understand, that it should have been proposed to carry into ideation the dichotomy between the physical and the moral. Many excellent authors have made the domain of the mind begin in the ideal. Matter is that which does not think. Descartes, in his *Discours de la Méthode* (4th part), remarking that he may pretend "not to have a body, and that there is no world or place in which he exists, but that he cannot pretend that he does not think," concludes by saying that the mind is "a substance,

all whose essence or nature is merely to think, and which has no need of either place or any other material thing, in order to exist;" in short, that "the soul is absolutely distinct from the body."^[19]

Let us, then, examine in what measure this separation between perception and ideation can be legitimately established. If we accept this separation, we must abandon the distinction I proposed between acts and objects of cognition, or, at least, admit that this distinction does not correspond to that between the physical and the moral, since thoughts, images, recollections, and even the most abstract conceptions, all constitute, in a certain sense, objects of cognition. They are phenomena which, when analysed, are clearly composed of two parts, an object and a cognition. Their logical composition is, indeed, that of an external perception, and there is in ideation exactly the same duality as in sensation. Consequently, if we maintain the above distinction as a principle of classification for all knowable phenomena, we shall be obliged to assign the same position to ideas as to sensations.

The principal difference we notice between sensation and idea is, it would seem, the character of unreality in the last named; but this opposition has not the significance we imagine. Our mental vision only assumes this wholly special character of unreality under conditions in which it is unable to harmonise with the real vision. Taine has well described the phases of the reduction of the image by sensation: it is at the moment when it receives the shock of an image which contradicts it, that the image appears as illusory.^[20] Let us suppose that we are sitting down dreaming and watching the passing by of our images. If, at this moment, a sudden noise calls us back to reality, the whole of our mental phantasmagoria disappears as if by the wave of a magic wand, and it is by thus vanishing that the image shows its falsity. It is false because it does not accord with the present reality.

But, when we do not notice a disagreement between these two modes of cognition, both alike give us the impression of reality. If I evoke a reminiscence and dwell attentively on the details, I have the impression that I am in face of the reality itself. "I feel as if I were there still," is a common saying; and, among the recollections I evoke, there are some which give me the same certitude as the perception of the moment. Certain witnesses

would write their depositions with their blood. One does not see this every day; but still one does see it.

Further, there are thousands of circumstances where the ideation is neither in conflict with the perception nor isolated from it, but in logical continuity with it. This continuity must even be considered as the normal condition. We think in the direction of that which we perceive. The image seems to prepare the adaptation of the individual to his surroundings; it creates the foresight, the preparation of the means, and, in a word, everything which constitutes for us a final cause. Now, it is very necessary that the image appear real to be usefully the substitute of the sensation past or to come.

Let us establish one thing more. Acting as a substitute, the image not only appears as real as the sensation, it appears to be of the same nature; and the proof is that they are confounded one with the other, and that those who are not warned of the fact take one for the other. Every time a body is perceived, as I previously explained, there are images which affix themselves to the sensation unnoticed. We think we perceive when we are really remembering or imagining. This addition of the image to the sensation is not a petty and insignificant accessory; it forms the major part, perhaps nine-tenths, of perception. Hence arise the illusions of the senses, which are the result, not of sensations but of ideas. From this also comes the difficulty of knowing exactly what, under certain circumstances, is observation or perception, where the fact perceived ends, and where conjecture begins. Once acquainted with all these possibilities of errors, how can we suppose a radical separation between the sensation and the image?

Examined more closely, images appear to us to be divisible into as many kinds as sensations: visual images correspond to visual sensations, tactile to tactile, and so on with all the senses.

That which we experience in the form of sensation, we can experience over again in the form of image, and the repetition, generally weaker in intensity and poorer in details, may, under certain favourable circumstances, acquire an exceptional intensity, and even equal reality: as is shown by hallucinations. Here, certainly, are very sound reasons for acknowledging that the images which are at the bottom of our thoughts, and form the object

of them, are the repetition, the modification, the transposition, the analysis or the synthesis of sensations experienced in the past, and possessing, in consequence, all the characteristics of bodily states. I believe that there is neither more nor less spirituality in the idea than in the sensation. That which forms its spirituality is the implied act of cognition; but its object is material.

I foresee a final objection: I shall be told that even when the unreality of the image is not the rule, and appears only under certain circumstances, it nevertheless exists. This is an important fact. It has been argued from the unreality of dreams and hallucinations in which we give a body to our ideas, that we do not in reality perceive external bodies, but simply psychical states and modifications of our souls. If our ideas consist—according to the hypothesis I uphold—in physical impressions which are felt, we shall be told that these particular impressions must participate in the nature of everything physical; that they are real, and always real; that they cannot be unreal, fictitious, and mendacious, and that, consequently, the fictitious character of ideation becomes inexplicable.

Two words of answer are necessary to this curious argument, which is nothing less than an effort to define the mental by the unreal, and to suppose that an appearance cannot be physical. No doubt, we say, every image, fantastical as it may seem as signification, is real in a certain sense, since it is the perception of a physical impression; but this physical nature of images does not prevent our making a distinction between true and false images. To take an analogous example: we are given a sheet of proofs to correct, we delete certain redundant letters, and, although they are printed with the same type as the other letters, we have the right to say they are false. Again, in a musical air, we may hear a false note, though it is as real as the others, since it has been played. This distinction between reality and truth ought to be likewise applied to mental images. All are real, but some are false. They are false when they do not accord with the whole reality; they are true when they agree; and every image is partly false because, being an image, it does not wholly accord with the actual perceptions. It creates a belief in a perception which does not occur; and by developing these ideas we could easily demonstrate how many degrees of falsehood there are.

Physiologically, we may very easily reconcile the falsity of the image with the physical character of the impression on which it is based. The image results from a partial cerebral excitement, which sensation results from an excitement which also acts upon the peripheral sensory nerves, and corresponds to an external object—an excitant which the image does not possess. This difference explains how it is that the image, while resulting from a physical impression, may yet be in a great number of cases declared false—that is to say, may be recognised as in contradiction to the perceptions.

To other minds, perhaps, metaphysical reasoning will be more satisfactory. For those, we propose to make a distinction between two notions, Existence or Reality, on the one hand, and Truth, on the other.

Existence or Reality is that of which we have an immediate apprehension. This apprehension occurs in several ways. In perception, in the first place. I perceive the reality of my body, of a table, the sky, the earth, in proportion to my perception of them. They exist, for if they did not, I could not perceive them. Another way of understanding reality is conception or thought. However much I may represent a thing to myself as imaginary, it nevertheless exists in a certain manner, since I can represent it to myself. I therefore, in this case, say that it is real or it exists. It is of course understood, that in these definitions I am going against the ordinary acceptance of the terms; I am taking the liberty of proposing new meanings. This reality is, then, perceived in one case and conceived in the other. Perceptibility or conceivability are, then, the two forms which reality may assume. But *reality* is not synonymous with *truth*; notwithstanding the custom to the contrary, we may well introduce a difference between these two terms. Reality is that which is perceived or conceived; truth is that which accords with the whole of our knowledge. Reality is a function of the senses or of ideation; truth is a function of reasoning or of the reason.

For cognition to be complete, it requires the aid of all these functions. And, in fact, what does conception by itself give? It allows us to see if a thing is capable of representation. This is not a common-place thing, I will observe in passing; for many things we name are not capable of representation, and there is often a criticism to be made; we think we are representing, and we are not. What is capable of representation exists as a representation, but is it

true? Some philosophers have imagined so, but they are mistaken; what we succeed in conceiving is alone possible.

Let us now take the Perceptible. Is what one perceives true? Yes, in most cases it is so in fact; but an isolated perception may be false, and disturbed by illusions of all kinds. It is all very well to say, "I see, I touch." There is no certainty through the senses alone in many circumstances that the truth has been grasped. If I am shown the spirit of a person I know to be dead, I shall not, notwithstanding the testimony of my eyes, believe it to be true, for this apparition would upset all my system of cognitions.

Truth is that which, being deemed conceivable, and being really perceived, has also the quality of finding its place, its relation, and its confirmation in the whole mass of cognitions previously acquired.

These distinctions,^[21] if developed, would readily demonstrate that the advantages of observation are not eclipsed by those of speculation; and that those of speculation, in their turn, do not interfere with those of observation. But we have not time to develop these rules of logic; it will be sufficient to point out their relation to the question of the reality of mental images. Here are my conclusions in two words. Physical phenomena and images are always real, since they are perceived or conceived; what is sometimes wanting to them, and makes them false, is that they do not accord with the rest of our cognitions.^[22]

Thus, then, are all objections overruled, in my opinion at least. We can now consider the world of ideas as a physical world; but it is one of a peculiar nature, which is not, like the other, accessible to all, and is subject to its own laws, which are laws of association. By these very different characteristics, it separates itself so sharply from the outer world that all endeavour to bring the two together seems shocking; and it is very easy to understand that many minds should wish to remain faithful to the conception that ideas form a mental or moral world. No metaphysical reasoning could prevail against this sentiment, and we must give up the idea of destroying it. But we think we have shown that idea, like sensation, comprises at the same time the physical and the mental.

FOOTNOTES:

[19] Let me say, in passing, that this separation that DESCARTES thinks he can establish between perception and ideation, is only conceivable on condition that it be not too closely examined, and that no exact definition of ideation be given. If we remark, in fact, that all thought is a reproduction, in some degree, of a sensation, we arrive at this conclusion: that a thought operated by a soul distinct from the body would be a thought completely void and without object, it would be the thought of nothingness. It is not, therefore, conceivable. Consequently the criterion, already so dangerous, which DESCARTES constantly employs—to wit: that what we clearly conceive is true—cannot apply to thought, if we take the trouble to analyse it and to replace a purely verbal conception by intuition.

[20] I somewhat regret that TAINE fell into the common-place idea of the opposition of the brain and thought; he took up again this old idea without endeavouring to analyse it, and only made it his own by the ornamentation of his style. And as his was a mind of powerful systematisation, the error which he committed led him into much wider consequences than the error of a more common mind would have done.

[21] I have just come across them again in an ingenious note of C. L. HERRICK: *The Logical and Psychological Distinction between the True and the Real* (*Psych. Rev.*, May 1904). I entirely agree with this author. But it is not he who exercised a suggestion over my mind; it was M. BERGSON. See *Matière et Mémoire*, p. 159.

[22] In order to remain brief, I have not thought fit to allude in the text to a question of metaphysics which closely depends on the one broached by me: the existence of an outer world. Philosophers who define sensation as a modality of our Ego are much embarrassed later in demonstrating the existence of an outer world. Having first admitted that our perception of it is illusory, since, when we think we perceive this world, we have simply the feeling of the modalities of our Ego, they find themselves powerless to demonstrate that this illusion corresponds to a truth, and invoke in despair, for the purpose of their demonstration, instinct, hallucination, or some *a priori* law of the mind. The position we have taken in the discussion is far more simple. Since every sensation is a fragment of matter perceived by a mind, the aggregate of sensations constitutes the aggregate of matter. There is in this no deceptive appearance, and consequently no need to prove a reality distinct from appearances. As to the argument drawn from dreams and hallucinations which might be brought against this, I have shown how it is set aside by a distinction between perceptibility and truth. It is no longer a matter of perception, but of reasoning. In other words, all that we see, even in dreams, is real, but is not in its due place.

CHAPTER IV

DEFINITION OF THE EMOTIONS

After sensations and images, we have to name among the phenomena of consciousness, the whole series of affective states—our pleasures and our pains, our joys and our griefs, our sentiments, our emotions, and our passions. It is universally admitted that these states are of a mental nature, for several reasons. (1) We never objectivate them as we do our sensations, but we constantly consider them as indwelling or subjective states. This rule, however, allows an exception for the pleasure and the pain termed physical, which are often localised in particular parts of our bodies, although the position attributed to them is less precise than with indifferent sensations. (2) We do not alienate them as we do our indifferent sensations. The sensations of weight, of colour, and of form serve us for the construction of bodies which appear to us as perceived by us, but as being other than ourselves. On the contrary, we constantly and without hesitation refer our emotional states to our *Ego*. It is I who suffer, we say, I who complain, I who hope. It is true that this attribution is not absolutely characteristic of mental phenomena, for it happens that we put a part of our *Ego* into material objects, such as our bodies, and even into objects separate from our bodies, and whose sole relation to us is that of a legal proprietorship. We must guard against the somewhat frequent error of identifying the *Ego* with the psychical.

These two reasons sufficiently explain the tendency to see only psychological states in the emotional ones; and, in fact, those authors who have sought to oppose mind to matter have not failed to introduce emotion into their parallel as representing the essence of mind. On this point I will recall the fine ironical image used by Tyndall, the illustrious English physicist, to show the abyss which separates thought from the molecular states of the brain. "Let us suppose," he says, "that the sentiment love, for example, corresponds to a right-hand spiral movement of the molecules of the brain and the sentiment hatred to a left-hand spiral movement. We should then know that when we love, a movement is produced in one

direction, and when we hate, in another. But the Why would remain without an answer."

The question of knowing what place in our metaphysical theory we ought to secure for emotion seems difficult to resolve, and we even find some pleasure in leaving it in suspense, in order that it may be understood that a metaphysician is not compelled to explain everything. Besides, the difficulties which atop us here are peculiarly of a psychological order. They proceed from the fact that studies on the nature of the emotions are still very little advanced. The physical conditions of these states are pretty well known, and their psychical and social effects have been abundantly described; but very little is known as to what distinguishes an emotion from a thought.

Two principal opinions may be upheld in the actual state of our acquaintance with the psychology of the feelings. When we endeavour to penetrate their essential and final nature, we have a choice between two contrary theories.

The first and traditional one consists in seeing in emotion a phenomenon *sui generis*; this is very simple, and leaves nothing more to be said.

The second bears the name of the intellectualist theory. It consists in expunging the characteristic of the affective states. We consider them as derivative forms of particular modes of cognition, and they are only "confused intelligence." This intellectualist thesis is of early date; it will be found in Herbart, who, by-the-by, gave it a peculiar form, by causing the play of images to intervene in the formation of the feelings. However, this particular point is of slight importance. The intellectualist theory is more vast than Herbartism; it exists in all doctrines in which the characteristic difference between thought and feeling is expunged and feeling is brought back to thought. One of the clearest means of so doing consists in only seeing in the feeling the fact of perceiving something. To perceive is, in fact, the property of intelligence; to reason, to imagine, to judge, to understand, is always, in a certain sense, to perceive. It has been imagined that emotion is nothing else than a perception of a certain kind, an intellectual act strictly comparable to the contemplation of a landscape. Only, in the place of a landscape with placid features you must put a storm,

a cataclysm of nature; and, instead of supposing this storm outside us, let it burst within us, let it reach us, not by the outer senses of sight and condition, but by the inner senses. What we then perceive will be an emotion.

Such is the theory that two authors—W. James and Lange—happened to discover almost at the same time, Lange treating it as a physiologist and W. James as a philosopher. Their theory, at first sight, appears singular, like everything which runs counter to our mental habits. It lays down that the symptoms which we all till now have considered as the physiological consequence, the translation, and the distant effects of the emotions, constitute their essential base. These effects are: the expression of the physiognomy, the gesture, the cry, and the speech; or the reflex action on the circulation, the pallor or blushing, the heat mounting to the head, or the cold of the shiver which passes over the body. Or it is the heart, which hastens or slackens its beats, or makes them irregular, or enfeebles, or augments them. Or the respiration, which changes its rhythm, or increases, or is suspended. Or else it is the secretion of the saliva or of the sweat, which flows in abundance or dries up. Or the muscular force, which is increased or decays. Or the almost undefinable organic troubles revealed to us by the singing in the ears, constriction of the epigastrium, the jerks, the trembling, vertigo, or nausea—all this collection of organic troubles which comes more or less confusedly to our consciousness under the form of tactile, muscular, thermal, and other sensations. Until now this category of phenomena has been somewhat neglected, because we saw in it effects and consequences of which the rôle in emotion itself seemed slight, since, if they could have been suppressed, it was supposed that emotion would still remain. The new theory commences by changing the order of events. It places the physical symptoms of the emotions at the very beginning, and considers them the direct effects of the external excitant, which is expressed by this elegant formula: "It used to be said, 'I perceive a danger; I am frightened, I tremble.' Now we must say, 'I tremble before a danger, first, and it is after having trembled that I am frightened.'" This is not a change in order only; it is something much more serious. The change is directed to the nature of emotion. It is considered to exist in the organic derangements indicated above. These derangements are the basis of emotion, its physical basis, and to be moved is to perceive them. Take away from the

consciousness this physical reflex, and emotion ceases. It is no longer anything but an idea.

This theory has at least the merit of originality. It also pleases one by its great clearness—an entirely intellectual clearness, we may say; for it renders emotion comprehensible by enunciating it in terms of cognition. It eliminates all difference which may exist between a perception and an emotion. Emotion is no longer anything but a certain kind of perception, the perception of the organic sensations.

This reduction, if admitted, would much facilitate the introduction of emotion into our system, which, being founded on the distinction between the consciousness and the object, is likewise an intellectualist system. The definition of emotion, as it is taught by W. James, seems expressly made for us who are seeking to resolve all intellectual states into physical impressions accompanied by consciousness.

By the side of emotion we may place, as demanding the same analytical study, the feeling of effort. We ought to inquire with effort, as has been done with emotion, what is the psychological nature of this phenomenon; and in the same way that there exists an intellectualist theory of the emotions, viz. that of James, who reduces all the history of the emotions to intelligence, so there exists an intellectualist theory of effort, which likewise tends to bring back, all will to intelligence. It is again the same author, that true genius, W. James, who has attempted this reduction. I do not know whether he has taken into account the parallelism of the two theories, but it is nevertheless evident. Effort, that basis of activity, that state of consciousness which so many psychologists have described as something *sui generis*, becomes to James a phenomenon of perception. It is the perception of sensations proceeding from the muscles, the tendons, the articulations, the skin, and from all the organs directly or indirectly concerned in the execution of movement. To be conscious of an effort would then be nothing else than to receive all these centripetal sensations; and what proves this is, that the consciousness of effort when most clearly manifested is accompanied by some muscular energy, some strong contraction, or some respiratory trouble, and yields if we render the respiration again regular and put the muscles back into repose.

To my great regret I can state nothing very clear regarding these problems. The attempt to intellectualise all psychical problems is infinitely interesting, and leads to a fairly clear conception, by which everything is explained by a mechanism reflected in a mirror, which is the consciousness. But we remain perplexed, and we ask ourselves whether this clearness of perception is not somewhat artificial, whether affectivity, emotivity, tendency, will, are really all reduced to perceptions, or whether they are not rather irreducible elements which should be added to the consciousness. Does not, for instance, desire represent a complement of the consciousness? Do not desire and consciousness together represent a something which does not belong to the physical domain and which forms the moral world? This question I leave unanswered.

CHAPTER V

DEFINITION OF THE CONSCIOUSNESS—THE RELATION SUBJECT-OBJECT

After having separated from the consciousness that which it is not, let us try to define what it is. This and the two following chapters are devoted to this study.

A theory has often been maintained with regard to the consciousness; namely, that it supposes a relation between two terms—a subject and an object, and that it consists exactly in the feeling of this relation. By subject is understood the something that has consciousness; the object is the something of which we are conscious. Every thought, we are told, implies subject and object, the representer and the represented, the *sentiens* and the *sensum*—the one active, the other passive, the active acting on the passive, the *ego* opposed to the *non ego*.

This opinion is almost legitimised by current language. When speaking of our states of consciousness, we generally say, "I am conscious; it is I who have consciousness," and we attribute to our I, to our Ego, to our personality, the rôle of subject. But this is not a peremptory argument in favour of the above opinion; it is only a presumption, and, closely examined, this presumption seems very weak.

Hitherto, when analysing the part of mind, we have employed non-committal terms: we have said that sensation implied consciousness, and not that sensation implied something which is conscious.^[23] The difference may appear too subtle, but it is not; it consists in taking from consciousness the notion of a subject being conscious and replacing it by the very act of consciousness.

My description applies very exactly, I think, to the facts. When we are engaged in a sensation, or when we perceive something, a phenomenon occurs which simply consists in having consciousness of a thing. If to this

we add the idea of the subject, which has consciousness, we distort the event. At the very moment when it is taking place, it is not so complicated; we complicate it by adding to it the work of reflection. It is reflection which constructs the notion of the subject, and it is this which afterwards introduces this construction into the states of consciousness; in this way the state of consciousness, by receiving this notion of subject, acquires a character of duality it did not previously possess. There are, in short, two separate acts of consciousness, and one is made the subject of the other. "Primitively," says Rabier, "there is neither representative nor represented; there are sensations, representations, facts of consciousness, and that is all. Nothing is more exact, in my opinion, than this view of Condillac's:—that primitively, the inanimate statue is entirely the sensation that it feels. To itself it is all odour and all savour; it is nothing more, and this sensation includes no duality for the consciousness. It is of an absolute simplicity."

Two arguments may be advanced in favour of this opinion. The first is one of logic. We have divided all knowledge into two groups—objects of cognition, and acts of cognition. What is the subject of cognition? Does it form a new group? By no means; it forms part of the first group, of the object group; for it is something to be known.

Our second argument is one of fact. It consists in remembering that which in practice we understand by the subject of cognition; or rather, metaphorically we represent this subject to ourselves as an organ—the eye that sees or the hand that touches—and we represent to ourselves the relation subject-object in the shape of a material relation between two distinct bodies which are separated by an interval and between which some action is produced which unites them. Or else, confusing the subject and the Ego, which are nevertheless two different notions, we place the Ego in the consciousness of the muscular effort struggling against something which resists. Or, finally and still more frequently, we represent the subject to ourselves by confusing it with our own personality; it is a part of our biography, our name, our profession, our social status, our body, our past life foreshortened, our character, or, in a word, our civil personality, which becomes the subject of the relation subject-object. We artificially endow this personality with the faculty of having consciousness; and it results from this that the entity consciousness, so difficult to define and to imagine, profits by all this factitious addition and becomes a person, visible and even

very large, in flesh and bone, distinct from the object of cognition, and capable of living a separate life.

It is not difficult to explain that all this clearness in the representation of ideas is acquired by a falsification of the facts. So sensorial a representation of consciousness is very unfaithful; for our biography does not represent what we have called acts of consciousness, but a large slice of our past experience—that is to say, a synthesis of bygone sensations and images, a synthesis of objects of consciousness; therefore a complete confusion between the acts of consciousness and their objects. The formation of the personality seems to me to have, above all, a legal and social importance. [24] It is a peculiar grouping of states of consciousness imposed by our relations with other individuals. But, metaphysically, the subject thus understood is not distinguished from the object, and there is nothing to add to our distinction between the object and the act of consciousness.

Those who defend the existence of the subject point out that this subject properly constitutes the Ego, and that the distinction of the subject and the object corresponds to the distinction of the Ego and non-Ego, and furnishes the separation between the physical and the moral so long sought.

It is evidently very enticing to make of the Ego thus a primitive notion of the consciousness; but this view of the Ego as opposed to the non-Ego in no way corresponds to that of the mental and the physical. The notion of the Ego is much larger, much more extensible, than that of the mental; it is as encroaching as human pride, it grasps in its conquering talons all that belongs to us; for we do not, in life, make any great difference between what is *we* and what is *ours*—an insult to our dog, our dwelling, or our work wounds us as much as an insult to ourselves. The possessive pronoun expresses both possession and possessor. In fact, we consider our body as being ourselves.

Here, then, are numbers of material things introducing themselves into the category of mental things. If we wished to expel them and to reduce the domain of the Ego to the domain of the mental, we could only do so if we already possessed the criterion of what is essentially mental. The notion of the Ego cannot therefore supply us with this criterion.

Another opinion consists in making of the subject a spiritual substance, of which the consciousness becomes a faculty. By substance is understood an entity which possesses the two following principal characteristics, unity and identity, this latter merging into unity, for it is nothing else but the persistence of unity through the course of time. Certain philosophers have asserted that through intuition we can all establish that we are a spiritual substance. I am compelled to reject this idea, because I think the expression *spiritual substance* has no meaning; nothing but the sonorous value of six syllables. It has also been supposed, that there exists a corporeal substance hidden under the sensations, in which are implanted the qualities of bodies, as the various organs of a flower are in its calyx. I will return later to this conception of a material substance. That of a spiritual substance cannot be defended, and the chief and fatal argument I urge against it is, that we cannot represent it to our minds, we cannot think it, and we cannot see in these words "spiritual substance" any intelligible idea; for that which is mental is limited to "that which is of the consciousness." So soon as we endeavour to go beyond the fact of having consciousness to imagine a particular state which must be mental, one of two things happen; either we only grasp the void, or else we construct a material and persistent object in which we recognise psychical attributes. These are two conclusions which ought to be rejected.

FOOTNOTES:

[23] This second method of expression, which I consider inexact, is constantly found in DESCARTES. Different philosophers have explicitly admitted that every act of cognition implies a relation subject-object. This is one of the corner-stones of the neo-criticism of RENOUVIER. He asserts that all representation is double-faced, and that what is known to us presents itself in the character of both representative and represented. He follows this up by describing separately the phenomena and laws of the representative and of the represented respectively.

[24] The preceding ten lines in the text I wrote after reading a recent article of WILLIAM JAMES, who wishes to show that the consciousness does not exist, but results simply from the relation or the opposition raised between one part of our experience (the actual experience, for instance, in the example of the perception of an object) and another part, the remembrance of our person. But the argument of JAMES goes too far; he is right in contesting the relation subject-object, but not in contesting the existence of the consciousness (W. JAMES: "Does consciousness exist?" in *J. of Philosophy, &c.*, Sept. 1904).

CHAPTER VI

DEFINITION OF THE CONSCIOUSNESS—CATEGORIES OF THE UNDERSTANDING

It has often been said that the rôle of intelligence consists in uniting or grasping the relations of things. An important question, therefore, to put, is, if we know whereof these relations consist, and what is the rôle of the mind in the establishment of a relation?

It now and then happens to us to perceive an isolated object, without comparing it with any other, or endeavouring to find out whether it differs from or resembles another, or presents with any other a relation of cause to effect, or of sign to thing signified, or of co-existence in time and space. Thus, I may see a red colour, and occupy all the intellect at my disposal in the perception of this colour, seeing nothing but it, and thinking of nothing but it. Theoretically, this is not impossible to conceive, and, practically, I ask myself if these isolated and solitary acts of consciousness do not sometimes occur.

It certainly seems to me that I have noticed in myself moments of intellectual tonelessness, when in the country, during the vacation, I look at the ground, or the grass, without thinking of anything—or at least, of anything but what I am looking at, and without comparing my sensation with anything. I do not think we should admit in principle, as do many philosophers, that "we take no cognisance save of relations." This is the *principle of relativity*, to which so much attention has been given. Taken in this narrow sense, it seems to me in no way imperative for our thoughts. We admit that it is very often applied, but without feeling obliged to admit that it is of perpetual and necessary application.

These reserves once made, it remains to remark, that the objects we perceive very rarely present themselves in a state of perfect isolation. On the contrary, they are brought near to other objects by manifold relations of resemblance, of difference, or of connection in time or space; and, further,

they are compared with the ideas which define them best. We do not have consciousness of an object, but of the relations existing between several objects. Relation is the new state produced by the fact that one perceives a plurality of objects, and perceives them in a group.

Show me two colours in juxtaposition, and I do not see two colours only, but, in addition, their resemblance in colour or value. Show me two lines, and I do not see only their respective lengths but their difference in length. Show me two points marked on a white sheet of paper, and I do not see only the colour, form, and dimension of the points, but their distance from each other. In our perceptions, as in our conceptions, we have perpetually to do with the relations between things. The more we reflect, the more we understand things, the more clearly we see their relations; the multiplication of relations is the measure of the depth of cognition.^[25]

The nature of these relations is more difficult to ascertain than that of objects. It seems to be more subtle. When two sounds make themselves heard in succession, there is less difficulty in making the nature of these two sounds understood than the nature of the fact that one occurs before the other. It would appear that, in the perception of objects, our mind is passive and reduced to the state of reception, working like a registering machine or a sensitive surface, while in the perception of relations it assumes a more important part.

Two principal theories have been advanced, of which one puts the relations in the things perceived, and the other makes them a work of the mind. Let us begin with this last opinion. It consists in supposing that the relations are given to things by the mind itself. These relations have been termed categories. The question of categories plays an important part in the history of philosophy. Three great philosophers, Aristotle, Kant, and Renouvier have drawn up a list, or, as it is called, a table of them, and this table is very long. To give a slight idea of it, I will quote a few examples, such as time, space, being, resemblance, difference, causality, becoming, finality, &c.

By making the categories the peculiar possession of the mind, we attribute to these cognitions the essential characteristic of being anterior to sensation, or, as it is also termed, of existing *a priori*: we are taught that not only are they not derived from experience, nor taught us by observation, but further

that they are presupposed by all observation, for they set up, in scholastic jargon, the conditions which make experience possible. They represent the personal contribution of the mind to the knowledge of nature, and, consequently, to admit them is to admit that the mind is not, in the presence of the world, reduced to the passive state of a *tabula rasa*, and that the faculties of the mind are not a transformation of sensation. Only these categories do not supplement sensation, they do not obviate it, nor allow it to be conjectured beforehand. They remain empty forms so long as they are not applied to experience; they are the rules of cognition and not the objects of cognition, the means of knowing and not the things known; they render knowledge possible, but do not of themselves constitute it, Experience through the senses still remains a necessary condition to the knowledge of the external world. It may be said that the senses give the matter of knowledge, and that the categories of the understanding give the form of it. Matter cannot exist without form, nor form without matter; it is the union of the two which produces cognition.

Such is the simplest idea that can be given of the Kantian theory of categories, or, if it is preferred to employ the term often used and much discussed, such is the theory of the Kantian idealism, This theory, I will say frankly, hardly harmonises with the ideas I have set forth up to this point. To begin with, let us scrutinise the relation which can exist between the subject and the object. We have seen that the existence of the subject is hardly admissible, for it could only be an object in disguise. Cognition is composed in reality of an object and an act of consciousness. Now, how can we know if this act of consciousness, by adding itself to the object, modifies it and causes it to appear other than it is?

This appears to me an insoluble question, and probably, even, a factitious one. The idea that an object can be modified in its nature or in its aspect comes to us through the perception of bodies. We see that, by attacking a metal with acids, this metal is modified, and that by heating a body its colour and form become changed; or that by electrifying a thread it acquires new properties; or that when we place glasses before our eyes we change the visible aspect of objects; or that, if we have inflammation of the eyelids, light is painful, and so on. All these familiar experiments represent to us the varied changes that a body perceived can undergo; but it must be carefully remarked that in cases of this kind the alteration in the body is produced by

the action of a second body, that the effect is due to an intercourse between two objects. On the contrary, when we take the Kantian hypothesis, that the consciousness modifies that which it perceives, we are attributing to the consciousness an action which has been observed in the case of the objects, and are thus transporting into one domain that which belongs to a different one; and we are falling into the very common error which consists in losing sight of the proper nature of the consciousness and making out of it an object.

If we set aside this incorrect assimilation, there no longer remains any reason for refusing to admit that we perceive things as they are, and that the consciousness, by adding itself to objects, does not modify them.

Phenomena and appearances do not, then, strictly speaking, exist. Till proof to the contrary, we shall admit that everything we perceive is real, that we perceive things always as they are, or, in other words, that we always perceive *noumena*.^[26]

After having examined the relations of the consciousness with its objects, let us see what concerns the perception, by the consciousness, of the relations existing between these objects themselves. The question is to ascertain whether the *a priorists* are right in admitting that the establishment of these relations is the work of the consciousness. The rôle of synthetic power that is thus attributed to consciousness is difficult to conceive unless we alter the definition of consciousness to fit the case. In accordance with the definition we have given and the idea we have of it, the consciousness makes us acquainted with what a thing is, but it adds nothing to it. It is not a power which begets objects, nor is it a power which begets relations.

Let us carefully note the consequence at which we should arrive, if, while admitting, on the one hand, that our consciousness lights up and reveals the objects without creating them, we were, on the other hand, to admit that it makes up for this passivity by creating relations between objects. We dare not go so far as to say that this creation of relations is arbitrary and corresponds in no way to reality; or that, when we judge two neighbouring or similar objects, the relations of contiguity and resemblance are pure

inventions of our consciousness, and that these objects are really neither contiguous nor similar.

It must therefore be supposed that the relation is already, in some manner, attracted into the objects; it must be admitted that our intelligence does not apply its categories haphazard or from the caprice of the moment; and it must be admitted that it is led to apply them because it has perceived in the objects themselves a sign and a reason which are an invitation to this application, and its justification. On this hypothesis, therefore, contiguity and resemblance must exist in the things themselves, and must be perceived; for without this we should run the risk of finding similar that which is different, and contiguous that which has no relation of time or space. Whence it results, evidently, that our consciousness cannot create the connection completely, and then we are greatly tempted to conclude that it only possesses the faculty of perceiving it when it exists in the objects.^[27]

According to this conception, the rôle of the consciousness in the perception of a connection is that of a witness, as in the perception of objects. The consciousness does not create, but it verifies. Resemblance is a physical property of objects, like colour; and contiguity is a physical property of objects, like form. The connections between the objects form part of the group object and not of the group consciousness, and they are just as independent of consciousness as are the objects themselves.

Against this conclusion we must anticipate several objections. One of them will probably consist in accentuating the difference existing between the object and the connection from the dynamical point of view. That the object may be passively contemplated by the consciousness can be understood, it will be said; but the relation is not only an object of perception—it is, further, a principle of action, a power of suggestion, and an agent of change.

It might, then, be supposed that the consciousness here finds a compensation for the rôle that has been withdrawn from it. If it is not the thing that creates the relation, it will be said, at least it is that which creates its efficacy of suggestion. Many psychologists have supposed that a relation has the power of evocation only when it has been perceived. The perception of resemblance precedes the action of resemblance. It is

consequently the consciousness which assembles the ideas and gives them birth by perceiving their relations.

This error, for it is one, has long been wide-spread—indeed, it still persists. [28] We have, however, no difficulty in understanding that the perception of a resemblance between two terms supposes them to be known; so long as only one of the terms is present to the consciousness, this perception does not exist; it cannot therefore possess the property of bringing to light the second term. Suggestion is therefore distinct from recognition; it is when suggestion has acted, when the resemblance in fact has brought the two terms together, that the consciousness, taking cognisance of the work accomplished, verifies the existence of a resemblance, and that this resemblance explains the suggestion.

Second objection: we are told that the relations between the objects—that is, the principal categories—must be of a mental nature, because they are *a priori*. That they are *a priori* means that they are at once anterior and superior to the experience. Let us see what this argument is worth.

It appears that it is somewhat misused. With regard to many of the categories, we are content to lay down the necessity of an abstract idea in order to explain the comprehension of a concrete one. It is said, for example: how can it be perceived that two sensations are successive, if we do not already possess the idea of time? The argument is not very convincing, because, for every kind of concrete perception it is possible to establish an abstract category.

It might be said of colour that it is impossible to perceive it unless it is known beforehand what colour is; and so on for a heap of other things. A more serious argument consists in saying that relations are *a priori* because they have a character of universality and of necessity which is not explained by experience, this last being always contingent and peculiar. But it is not necessary that a function should be mental for it to be *a priori*. The identification of the *a priori* with the mental is entirely gratuitous. We should here draw a distinction between the two senses of the *a priori*: anteriority and superiority.

A simple physical mechanism may be *a priori*, in the sense of anteriority. A house is *a priori*, in regard to the lodgers it receives; this book is *a priori*, in

regard to its future readers. There is no difficulty in imagining the structure of our nervous system to be *a priori*, in regard to the excitements which are propagated in it. A nerve cell is formed, with its protoplasm, its nucleus and its nucleoli before being irritated; its properties precede its functions. If it be possible to admit that as a consequence of ancestral experiences the function has created the organ, the latter is now formed, and this it is which in its turn becomes anterior to the function. The notion of *a priori* has therefore nothing in it which is repugnant to physical nature.

Let us now take the *a priori* in the sense of superiority. Certain judgments of ours are, we are told, universal and necessary, and through this double character go beyond the evidence of experience. This is an exact fact which deserves to be explained, but it is not indispensable to explain it by allowing to the consciousness a source of special cognitions. The English school of philosophy have already attacked this problem in connection with the origin of axioms. The principle of their explanation lies in the virtue of what they have termed "inseparable association." They have supposed that when an association is often repeated it creates a habit of thought against which no further strife is possible. The mechanism of association itself should then add a special virtue to the contingency of facts. A hundred repetitions of related facts, for example, would give rise to so firm an association, that no further repetition would increase it.

I consider this explanation a very sound one in principle. It is right to put into association something more than into experience. I would only suggest a slight correction in detail. It is not the association forged by repetition which has this virtue of conveying the idea of necessity and universality, it is simply the uncontradicted association. It has been objected, in fact, and with reason, to the solution of Mill, that it insists on a long duration of experience, while axioms appear to be of an irresistible and universal truthfulness the moment they are conceived. And this is quite just. I should prefer to lay down as a law that every representation appears true, and that every link appears necessary and universal as soon as it is formed. This is its character from the first. It preserves it so long as no contradiction in fact, in reasoning, or in idea, comes to destroy it.^[29]

What seems to stand out most clearly after all these explanations is the rôle which we ought to attribute to the consciousness. Two rival theories have

been maintained: that of the mirror-consciousness and that of the focus-consciousness. It would seem—I merely say it would seem—that the first of these best harmonises with the preceding facts. For what seems most probable is, that the consciousness illuminates and reveals but does not act. The theory of the focus-consciousness adapts itself less to the mechanism of the association of ideas.

From this we come quite naturally to see in the intelligence only an inactive consciousness; at one moment it apprehends an object, and it is a perception or an idea; at another time it perceives a connection, and it is a judgment; at yet another, it perceives connections between connections, and it is an act of reason. But however subtle the object it contemplates may become, it does not depart from its contemplative attitude, and cognition is but a consciousness.

One step further, and we should get so far as to admit that the consciousness serves no purpose whatever, and that it is a useless luxury, since, if all efficacious virtue is to be found in the sensations and the ideas which we consider as material facts, the consciousness which reveals them adds nothing to, takes nothing from and modifies nothing in them; and everything would go on the same, nor would anything in this world be changed, if one day the light of consciousness were, by chance, to be put out. We might imagine a collection of automatons forming a human society as complicated as, and not different in appearance from, that of conscious beings; these automatons would make the same gestures, utter the same words as ourselves, would dispute, complain, cry, and make love like us; we might even imagine them capable, like us, of psychology. This is the thesis of the epiphenomenal consciousness which Huxley has boldly carried to its uttermost conclusions.

I indicate here these possible conclusions, without discussing them. It is a question I prefer to leave in suspense; it seems to me that one can do nothing on this subject but form hypotheses.

FOOTNOTES:

[25] At the risk of being deemed too subtle, I ask whether we are conscious of a relation between objects, or whether that which occurs is not rather the perception of an object which has been modified in its nature by its relation with another object.

[26] This conclusion may seem contradictory to that which I enunciated when studying the constitution of matter. I then asserted that we only know our sensations and not the excitants which produce them. But these sensations are matter; they are matter modified by other matter, viz. our nervous centres.

We therefore take up very distinctly an opposite standpoint to the principle of *relativity*: in other terms, we reject the phenomenism of Berkeley.

When we go into metaphysics we are continually astounded to see how different conceptions of things which have a classic value are independent of each other. In general, phenomenism is opposed to substantialism, and it is supposed that those who do not accept the former doctrine must accept the latter, while, on the contrary, those who reject substantialism must be phenomenists. We know that it is in this manner that Berkeley conquered corporeal substantialism and taught phenomenism; while Hume, more radical than he, went so far as to question the substantialism of mind. On reflection, it seems to me that, after having rejected phenomenism, we are in no way constrained to accept substance. By saying that we perceive things as they are, and not through a deluding veil, we do not force ourselves to acknowledge that we perceive the substance of bodies—that is to say, that something which should be hidden beneath its qualities and should be distinct from it. The distinction between the body and its qualities is a thing useful in practice, but it answers to no perception or observation. The body is only a group, a sheaf of qualities. If the qualities seem unable to exist of themselves and to require a subject, this is only a grammatical difficulty, which is due to the fact that, while calling certain sensations qualities, we suppose a subject to be necessary. On the other hand, the representation which we make to ourselves of a material substance and its rôle as the support of the qualities, is a very naïve and mechanical representation, thanks to which certain sensations become the supports of other and less important sensations. It would suffice to insist on the detail of this representation and on its origin to show its artificial character. The notion we have of the stability of bodies and of the persistence of their identity, notwithstanding certain superficial changes, is the reason for which I thought proper to attribute a substance to them, that is to say, an invariable element. But we can attain the same end without this useless hypothesis; we have only to remark that the identity of the object lies in the aggregate of its properties, including the name it bears. If the majority of its properties, especially of those most important to us, subsists without alteration, or if this alteration, though of very great extent, takes place insensibly and by slow degrees, we decide that the object remains the same. We have no need for that purpose to give it a substance one and indestructible. Thus we are neither adherents of phenomenism, nor of substantialism.

[27] I borrow from RABIER this argument, which has thoroughly convinced me (see *Psychologie*, p. 281).

[28] PILON is the psychologist who has the most forcibly demonstrated that resemblance acts before being perceived. I refer the readers to my *Psychologie du Raisonnement*, where I have set forth this little problem in detail.

[29] We think spontaneously of the general and the necessary. It is this which serves as a basis for the suggestion and the catchword (*réclame*), and it explains how minds of slender culture always tend towards absolute assertions and hasty generalisations.

CHAPTER VII

DEFINITION OF THE CONSCIOUSNESS—THE SEPARABILITY OF THE CONSCIOUSNESS FROM ITS OBJECT—DISCUSSION OF IDEALISM

One last question suggests itself with regard to the consciousness. In what measure is it separable from the object? Do the consciousness and its object form two things or only one?

Under observation these two terms constantly show themselves united. We experience a sensation and have consciousness of it; it is the same fact expressed in two different ways. All facts of our perception thus present themselves, and they are one. But our reason may outstrip our observation. We are able to make a distinction between the two elements *being* and *being perceived*. This is not an experimental but an ideological distinction, and an abstraction that language makes easy.

Can we go further, and suppose one of the parts thus analysed capable of existing without the other? Can sensation exist as physical expression, as an object; without being illuminated by the consciousness? Can the consciousness exist without having an object?

Let us first speak of the existence of the object when considered as separated from the consciousness. The problem is highly complicated.

It has sometimes been connected with the idealist thesis according to which the object of consciousness, being itself a modality of the consciousness, cannot exist apart from it—that is to say, outside the periods in which it is perceived. It would therefore result from this that this separation between existence and perception might be made, when it is admitted (contrary to the idealist hypothesis) that the object perceived is material and the consciousness which perceives it mental. In this case, it will be thought, there is no link of solidarity between the consciousness and its continuity. But I am not of that opinion. The union of the consciousness and its object

is one of fact, which presents itself outside any hypothesis on the nature of the object. It is observation which demonstrates to us that we must perceive an object to be assured of its existence; the reason, moreover, confirms the necessity of this condition, which remains true whatever may be the "stuff" of the object.

Having stated this, the question is simply to know whether this observation of fact should be generalised or not. We may, it seems to me, decline to generalise it without falling into a contradiction in terms. It may be conceived that the objects which we are looking at continue to exist, without change, during the moments when we have lost sight of them. This seems reasonable enough, and is the opinion of "common" sense.[\[30\]](#)

The English philosophers, Bain and Mill, have combated this proposition with extraordinary ardour, like believers combating a heresy. But notwithstanding their attacks it remains intelligible, and the distinction between *being* and *being perceived* preserves its logical legitimacy. This may be represented, or may be thought; but can it be realised?

So far as regards external objects, I think we all, in fact, admit it. We all admit a distinction, between the existence of the outer world and the perception we have of it; its existence is one thing, and our perception of it is another. The existence of the world continues without interruption; our perception is continually interrupted by the most fortuitous causes, such as change of position, or even the blinking of the eyes; its existence is general, universal, independent of time and space; our perception is partial, particular, local, limited by the horizon of our senses, determined by the geographical position of our bodies, riddled by the distractions of our intelligence, deceived by the illusions of our minds, and above all diminished by the infirmity of our intelligence, which is able to comprehend so little of what it perceives. This is what we all admit in practice; the smallest of our acts implies the belief in something perceptible which is wider and more durable than our astonished perceptions. I could not write these lines unless I implicitly supposed that my inkstand, my paper, my pen, my room, and the surrounding world subsist when I do not see them. It is a postulate of practical life. It is also a postulate of science, which requires for its explanations of phenomena the supposition in them of an indwelling continuity. Natural science would become unintelligible if we

were forced to suppose that with every eclipse of our perceptions material actions were suspended. There would be beginnings without sequences, and ends without beginnings.

Let us note also that acquired notions on the working of our nervous system allow us to give this postulate a most precise form: the external object is distinct from the nervous system and from the phenomena of perception which are produced when the nervous system is excited; it is therefore very easy to understand that this object continues to exist and to develop its properties, even when no brain vibrates in its neighbourhood.

Might we not, with the view of strengthening this conclusion as to the continuous existence of things, dispense with this postulate, which seems to have the character of a grace, of an alms granted to us? Might not this continuous existence of objects during the eclipses of our acts of consciousness, be demonstrated? It does not seem to me impossible. Let us suppose for a moment the correctness of the idealist thesis: all our legitimate knowledge of objects is contained within the narrow limits of actual sensation; then, we may ask, of what use is the reason? What is the use of the memory? These functions have precisely for their object the enlarging of the sphere of our sensations, which is limited in two principal ways, by time and by space. Thanks to the reason, we manage to see in some way that which our senses are unable to perceive, either because it is too distant from us, or because there are obstacles between us and the object, or because it is a past event or an event which has not yet taken place which is in question.

That the reason may be deceived is agreed. But will it be asserted that it is always deceived? Shall we go so far as to believe that this is an illegitimate mode of cognition? The idealist thesis, if consistent, cannot refuse to extend itself to this extreme conclusion; for a reasoned conclusion contains, when it has a meaning, a certain assertion on the order of nature, and this assertion is not a perception, since its precise object is to fill up the gaps in our perceptions. Not being a perception, it must be rejected, if one is an idealist.

The idealist will therefore keep strictly to the perception of the moment, and this is so small a thing when deprived of all the conjectures which enrich it,

that the world, if reduced to this alone, would be but the skeleton of a world. There would then be no more science, no possibility of knowledge. But who could make up his mind thus to shut himself up in perception?

I suppose, indeed, that there will here be quibbling. This objection will be made: that in the hypothesis of a discontinuous existence of things, reason may continue to do its work, provided the intervention of a possible perception be supposed. Thus, I notice this morning, on going into my garden, that the pond which was dry yesterday is full of water. I conclude from this, "It has rained in the night." To be consistent with idealism, one must simply add: "If some one had been in the garden last night, he would have seen it rain." In this manner one must re-establish every time the rights of perception.

Be it so. But let us notice that this addition has no more importance than a prescribed formula in a notarial act; for instance, the presence of a second notary prescribed by the law, but always dispensed with in practice. This prescribed formula can always be imagined or even understood. We shall be in accord with idealism by the use of this easy little formula, "If some one had been there," or even by saying, "For a universal consciousness...." The difference of the realist and idealist theory becomes then purely verbal. This amounts to saying that it disappears. But there is always much verbalism in idealism.

One more objection: if this witness—the consciousness—suffices to give objects a continuity of existence, we may content ourselves with a less important witness. Why a man? The eyes of a mollusc would suffice, or those of infusoria, or even of a particle of protoplasm: living matter would become a condition of the existence of dead matter. This, we must acknowledge, is a singular condition, and this conclusion condemns the doctrine.

FOOTNOTES:

[30] That is to say, the sense of the multitude.—ED.

CHAPTER VIII

DEFINITION OF THE CONSCIOUSNESS—THE SEPARATION OF THE CONSCIOUSNESS FROM ITS OBJECT—THE UNCONSCIOUS

I ask myself whether it is possible, by going further along this road of the separation between the consciousness and its object, to admit that ideas may subsist during the periods when we are not conscious of them. It is the problem of unconsciousness that I am here stating.

One of the most simple processes of reasoning consists in treating ideas in the same manner as we have treated the external objects. We have admitted that the consciousness is a thing superadded to the external objects, like the light which lights up a landscape, but does not constitute it and may be extinguished without destroying it. We continue the same interpretation by saying that ideas prolong their existence while they are not being thought, in the same way and for the same motive that material bodies continue theirs while they are not being perceived. All that it seems permissible to say is that this conception is not unrealisable.

Let us now place ourselves at the point of view of the consciousness. We have supposed up to the present the suppression of the consciousness, and have seen that we can still imagine the object continuing to exist. Is the converse possible? Let us suppose that the object is suppressed. Can the consciousness then continue to exist? On this last point it seems that doubt is not possible, and we must answer in the negative. A consciousness without an object, an empty consciousness, in consequence, cannot be conceived; it would be a zero—a pure nothingness; it could not manifest itself. We might admit, in strictness, that such a consciousness might exist virtually as a power which is not exercised, a reserve, a potentiality, or a possibility of being; but we cannot comprehend that this power can realise or actualize itself. There is therefore no actual consciousness without an object.

The problem we have just raised, that of the separability of the elements which compose an act of consciousness, is continued by another problem—that of unconsciousness. It is almost the same problem, for to ask one's self what becomes of a known thing when we separate from it the consciousness which at first accompanied it, is to ask one's self in what an unconscious phenomenon consists.

We have, till now, considered the two principal forms of unconsciousness—that in nature and that in thought. The first named unconsciousness does not generally bear that name, but is rather discussed under the name of idealism and realism. Whatever be their names, these two kinds of unconsciousness are conceivable, and the more so that they both belong to physical nature.

If we allow ourselves to be guided by the concept of separability, we shall now find that we have exhausted the whole series of possible problems, for we have examined all the possible separations between the consciousness and its objects; but if we use another concept, that of unconsciousness, we can go further and propound a new problem: can the consciousness become unconscious? But it is proper first to make a few distinctions. It is the rôle of metaphysics to make distinctions.[\[31\]](#)

Unconsciousness presupposes a death of the consciousness; but this death has its degrees, and before complete extinction we may conceive it to undergo many attenuations. There is, first, the diminution of consciousness.

Consciousness is a magnitude capable of increase and decrease, like sensation itself. According to the individual, consciousness may have a very large or a very small field, and may embrace at the same time a variable number of objects. I can pay attention to several things at the same time, but when I am tired it becomes more difficult to me. I lose in extension, or, as is still said, the field of consciousness is restricted. It may also lose not only in extent of surface, but in depth. We have all of us observed in our own selves moments of obscure consciousness when we understand dimly, and moments of luminous consciousness which carry one almost to the very bottom of things. It is difficult to consider those in the wrong who admit, with Leibnitz, the existence of small states of consciousness. The lessening of the consciousness is already our means of understanding the unconscious; unconsciousness is the limit of this reduction.[\[32\]](#)

This singular fact has also been noticed, that, in the same individual there may co-exist several kinds of consciousness which do not enter into communication with each other and which are not acquainted with each other. There is a principal consciousness which speaks, and, in addition, accessory kinds of consciousness which do not speak, but reveal their existence by the use of other modes of expression, of which the most frequent is writing.

This doubling or fractionation of the consciousness and personality have often been described in the case of hysterical subjects. They sometimes occur quite spontaneously, but mostly they require a little suggestion and cultivation. In any case, that they are produced in one way or other proves that they are possible, and, for the theory, this possibility is essential. Facts of this kind do not lead to a theory of the unconscious, but they enable us to understand how certain phenomena, unconscious in appearance, are conscious to themselves, because they belong to states of consciousness which have been separated from each other.

A third thesis, more difficult of comprehension than the other two, supposes that the consciousness may be preserved in an unconscious form. This is difficult to admit, because unconsciousness is the negation of consciousness. It is like saying that light can be preserved when darkness is produced, or that an object still exists when, by the hypothesis, it has been radically destroyed. This idea conveys no intelligible meaning, and there is no need to dwell on it.

We have not yet exhausted all the concepts whereby we may get to unconsciousness. Here is another, the last I shall quote, without, however, claiming that it is the last which exists. We might call it the physiological concept, for it is the one which the physiologists employ for choice. It is based upon the observation of the phenomena which are produced in the nervous system during our acts of consciousness; these phenomena precede consciousness as a rule, and condition it. According to a convenient figure which has been long in use, the relations of the physiological phenomenon to the consciousness are represented as follows: the physiological phenomenon consists in an excitement which, at one time, follows a direct and short route from the door by which it enters the nervous system to the door by which it makes its exit. In this case, it works like a simple

mechanical phenomenon; but sometimes it makes a longer journey, and takes a circuitous road by which it passes into the higher nerve centres, and it is at the moment when it takes this circuitous road that the phenomenon of consciousness is produced. The use of this figure does not prejudge any important question.

Going further, many contemporary authors do not content themselves with the proposition that the consciousness is conditioned by the nervous phenomenon, but suggest also that it is continually accompanied by it. Every psychical fact of perception, of emotion, or of idea should have, it is supposed, a physiological basis. It would therefore be, taken in its entirety, psycho-physiological. This is called the parallelist theory.

We cannot discuss this here, as we shall meet with it again in the third part of this book. It has the advantage of leading to a very simple definition of unconsciousness. The unconscious is that which is purely physiological. We represent to ourselves the mechanical part of the total phenomenon continuing to produce itself, in the absence of the consciousness, as if this last continued to follow and illuminate it.

Such are the principal conceptions that may be formed of the unconscious. They are probably not the only ones, and our list is not exhaustive.

After having indicated what the unconscious is, we will terminate by pointing out what it is not and what it cannot be.

We think, or at least we have impliedly supposed in the preceding definitions, that the unconscious is only something unknown, which may have been known, or which might become known under certain conditions, and which only differs from the known by the one characteristic of not being actually known. If this notion be correct, one has really not the right to arm this unconsciousness with formidable powers. It has the power of the reality to which it corresponds, but its character of unconsciousness adds nothing to this. It is the same with it as with the science of the future. No scholar will hesitate to admit that that science will be deeper and more refined than that already formed. But it is not from the fact that it is unknown that it will deserve its superiority: it is from the phenomena that it will embrace. To give to that which is unconscious, as we here understand it, an overwhelming superiority over the conscious as such, we must admit

that the consciousness is not only a useless luxury, but the dethronement of the forces that it accompanies.

In the next place, I decline to admit that the consciousness itself can become unconscious, and yet continue in some way under an unconscious form. This would be, in my opinion, bringing together two conceptions which contradict each other, and thus denying after having affirmed. From the moment that the consciousness dies, there remains nothing of it, unless it be the conditions of its appearance, conditions which are distinct from itself. Between two moments of consciousness separated by time or by a state of unconsciousness, there does not and cannot exist any link. I feel incapable of imagining of what this link could be composed, unless it were material—that is to say, unless it were supplied from the class of objects. I have already said that the substantialist thesis endeavours to establish a continuity between one consciousness and another separated by time, by supposing a something durable, of which the consciousness would be a property of intermittent manifestation. They would thus explain the interruptions of consciousness as the interruptions in the light of a lamp. When the light is extinguished, the lamp remains in darkness, but is still capable of being lighted. Let us discard this metaphor, which may lead to illusion. The concept of consciousness can furnish no link and no mental state which remains when the consciousness is not made real; if this link exists, it is in the permanence of the material objects and of the nervous organism which allows the return of analogous conditions of matter.

FOOTNOTES:

[31] In metaphysics we reason, not on facts, but most often on conceptions. Now just as facts are precise so conceptions are vague in outline. Facts are like crystallised bodies, ideas like liquids and gases. We think we have an idea, and it changes form without our perceiving it. We fancy we recognise one idea, and it is but another, which differs slightly from the preceding one. By means of distinctions we ought to struggle against this flowing away and flight of ideas.

[32] I think I have come across in ARISTOTLE the ingenious idea that the enfeeblement of the consciousness and its disorder may be due to the enfeeblement and disorder of the object. It is a theory which is by no means improbable.

CHAPTER IX

DEFINITIONS OF PSYCHOLOGY

Let us resume the study of the preceding ideas in another form. Since, moreover, to define mind is at the same time to define psychology, let us seek for the truth which we can glean from the definitions of this science. Our object is not to discover an exact definition, but to make use of those already existing.

To define psychology is to describe the features of the domain over which this science holds sway, and at the same time to indicate the boundaries which separate it from its neighbours. At first sight this is an affair of geometric survey, presenting no kind of difficulty; for psychology does not merge by insensible transitions into the neighbouring sciences, as physics does with chemistry, for example, or chemistry with biology.

To all the sciences of external nature psychology offers the violent opposition of the moral to the physical world. It cannot be put in line with the physical sciences. It occupies, on the contrary, a position apart. It is the starting point, the most abstract and simple of the moral sciences; and it bears the same relation to them that mechanics does to the physical.

All this is doubtless true; and yet a very great difficulty has been experienced in condensing into a clear definition the essence of psychology. This is proved by the multiplicity of definitions attempted. They are so many because none of them has proved completely satisfactory. Their abundance shows their insufficiency. I will try to introduce a little order into these attempts, and propose to distribute the definitions of psychology into the following categories:—

1. The definition by substance; the metaphysical definition *par excellence*.
2. The definition by enumeration.

3. " " method.
4. " " degree of certainty.
5. " " content.
6. " " point of view.
7. " " the peculiar nature of mental laws.

We will rapidly run through this series of efforts at definition, and shall criticise and reject nearly the whole of them; for the last alone seems exact—that is to say, in harmony with the ideas laid down above.

Metaphysical definition has to-day taken a slightly archaistic turn. Psychology used to be considered as the *science of the soul*. This is quite abandoned. Modern authors have adopted the expression and also the idea of Lange,^[33] who was, I think, the first to declare that we ought to cultivate a *soulless psychology*. This categorical declaration caused an uproar, and a few ill-informed persons interpreted it to mean that the new psychology which has spread in France under cover of the name of Ribot, sought to deny the existence of the soul, and was calculated to incline towards materialism. This is an error.

It is very possible, indeed, that several adepts of the new or experimental psychology may be materialists from inward conviction. The exclusive cultivation of external facts, of phenomena termed material, evidently tends—this is a mystery to none—to incline the mind towards the metaphysical doctrine of materialism. But, after making this avowal, it is right to add at once that psychology, as a science of facts, is the vassal of no metaphysical doctrine. It is neither spiritualist, materialist, nor monist, but a science of facts solely. Ribot and his pupils have proclaimed this aloud at every opportunity. Consequently it must be recognised that the rather amphibological expression "soulless psychology" implies no negation of the existence of the soul. It is—and this is quite a different thing—rather an attitude of reserve in regard to this problem. We do not solve this problem; we put it on one side.

And, certainly, we are right to do so. The soul, viewed as a substance—that is, as a something distinct from psychical phenomena, which, while being their cause and support, yet remains inaccessible to our direct means of

cognition—is only an hypothesis, and it cannot serve as objective to a science of facts. This would imply a contradiction in terms.

Unfortunately; we must confess that if it be right to relegate to metaphysics the discussion on the concept of the soul, it does not really suffice to purge our minds of all metaphysics; and a person who believes himself to be a simple and strict experimentalist is often a metaphysician without knowing it. These excommunications of metaphysics also seem rather childish at the present day. There is less risk than some years ago in declaring that: "Here metaphysics commence and positive science ends, and I will go no further." There is even a tendency in modern psychologists to interest themselves in the highest philosophical problems, and to take up a certain position with regard to them.

The second kind of definition is, we have said, that by enumeration. It consists in placing before the eyes of the reader an assortment of psychological phenomena and then saying: "These are the things psychology studies." One will take readily as samples the ideas, reasonings, emotions, and other manifestations of mental life. If this is only a strictly provisional definition, a simple introduction to the subject, we accept it literally. It may serve to give us a first impression of things, and to refresh the memories of those who, by a rather extraordinary chance, would not doubt that psychology studies our thoughts. But whatever may be the number of these deeply ignorant persons, they constitute, I think, a negligible quantity; and, after these preliminaries, we must come to a real definition and not juggle with the problem, which consists in indicating in what the spiritual is distinguished from the material. Let us leave on one side, therefore, the definitions by enumeration.

Now comes the definition by method. Numbers of authors have supposed that it is by its method that psychology is distinguished from the other sciences.

To the mind is attached the idea of the within, to nature the idea of being without the mind, of constituting a "without" (*un dehors*). It is a vague idea, but becomes precise in a good many metaphors, and has given rise to several forms of speech. Since the days of Locke, we have always spoken of the internal life of the mind as contrasted with the external life, of

subjective reality as contrasted with objective reality; and in the same way we oppose the external senses to the inner sense (the internal perception), which it has at times been proposed to erect into a sixth sense. Though no longer quite the Cartesian dualism, this is still a dualism.

It has also been said that psychology is the science of introspection, and, in addition, that scientific psychology is a controlled introspection. This science of the "internal facts of man" would thus be distinguished from the other natural sciences which are formed by the use of our outer senses, by external observation—that is to say, to use a neologism, by externospection. This verbal symmetry may satisfy for a moment minds given to words, but on reflection it is perceived that the distinction between introspection and externospection does not correspond to a fundamental and constant difference in the nature of things or in the processes of cognition. I acknowledge it with some regret, and thus place myself in contradiction with myself; for I for a long time believed, and have even said in print, that psychology is the science of introspection. My error arose from my having made too many analyses of detail, and not having mounted to a sufficiently wide-reaching conception.

The definition I have given of consciousness is the implied condemnation of the above ideas. Consciousness, being nothing but an act of revelation, has neither a within nor a without; it does not correspond to a special domain which would be an inner one with regard to another domain.

Every consideration on the position of things is borrowed from the sphere of the object, and remains foreign to the sphere of the consciousness. It is by an abuse of language that we speak of the outer world in relation to the world of consciousness, and it is pure imagination on the part of philosophers to have supposed that our sensations are first perceived as internal states and states of consciousness, and are subsequently projected without to form the outer world. The notion of internal and external is only understood for certain objects which we compare by position to certain others.

In fact, we find that the opposition between an external and an internal series is generally founded on two characteristics: sensation is considered external in relation to the idea, and an object of cognition is considered as

internal when it is accessible only to ourselves. When these two characteristics are isolated from each other, one may have doubts; but when they co-exist, then the outwardness or inwardness appears fully evidenced. We see then that this distinction has nothing to do with the value of consciousness, and has nothing mental about it.

It is thus that our ideas are judged from internal events. It is our microcosm opposed to the macrocosm. It is the individual opposed to the social. Looking at an external object, we remain in communion with our fellows, for we receive, or think we receive, identical sensations. At all events, we receive corresponding sensations. On the other hand, my thought is mine, and is known to me alone; it is my sanctuary, my private closet, where others do not enter. Every one can see what I see, but no one knows what I think.

But this difference in the accessibility of phenomena is not due to their peculiar nature. It is connected with a different fact, with the modes of excitement which call them forth. If the visual sensation is common to all, it is because the exciting cause of the sensation is an object external to our nervous systems, and acting at a distance on all.^[34] The tactile sensation is at the beginning more personal to the one who experiences it, since it requires contact; and the lower sensations are in this intimacy still in progress. And then, the same object can give rise, in common-place circumstances, to a sensation either common to all beings or special to one alone. The capsule of antipyrine which I swallow is, before my doing so, visible to all eyes; once in my mouth, I am the only one to perceive it. It is therefore possible that the same sensation, according to the displacements of the object which excites it, may make part of the internal or of the external series; and as all psychic life is sensation, even effort, and, as we are assured, emotion, it follows that our argument extends to all the psychical elements.

Finally, the internal or external character of events, which might be called their geographical position, is a characteristic which has no influence upon the method destined to take cognisance of it. The method remains one. Introspection does not represent a source of cognition distinct from exterospection, for the same faculties of the mind—reason, attention, and reflection—act on sensation, the source of the so-called external sciences,

and on the idea, the source of the so-called inner science. A fact can be studied by essentially the same process, whether regarded by the eyes or depicted by the memory. The consciousness changes its object and orientation, not its nature. It is as if, with the same opera-glass, we looked in turn at the wall of the room and through the window.

I can even quote on this point a significant fact: there are observers who are organised in such a way that they especially observe by memory. Placed before the sensorial phenomenon which strikes their senses, they are sometimes amazed, as if hypnotised; they require to get away from it to regain consciousness of themselves, to analyse the fact, and to master it, and it is by means of the memory that they study it, on condition, of course, of afterwards coming back to verify their conclusions by a fresh observation from nature. Will it be said that the physicist, the chemist, or the biologist who follows this slow method, and who thus observes retroactively, practises physics and biology by introspection? Evidently this would be ridiculous.

Conversely, introspection may, in certain cases, adopt the procedure of exterospection. No doubt it would be inexact to say that the perception of one of our ideas always takes place through the same mechanism as the perception of one of our sensations. To give an account of what we think does not imply the same work as in the case of what we see; for, generally, our thoughts and our images do not appear to us spontaneously. They are first sought for by us, and are only realised after having been wished for. We go from the vague to the precise, from the confused to the clear; the direction of thought precedes, then, its realisation in images; and the latter, being expected, is necessarily comprehended when it is formed. But we may come across curious circumstances in which it is the image which has precedence over its appearance, and in that case it is exact to say that this uninvoked image must be interpreted and recognised as if it were an external object. In cases of this kind, there passes through our mind something which surprises us. I see, by internal vision, a face with a red nose, and I have to search my memory for a long time, even for days, in order to give precision to the vague feeling that I have seen it before, so as to finally say with confidence, "It is So and So!" Or else I hear in my inner ear a certain voice, with a metallic tone and authoritative inflections: this voice pronounces scientific phrases, gives a series of lectures, but I know

not to whom it belongs, and it costs me a long effort to reach the interpretation: it is the voice of M. Dastre! There is, then, a certain space of time, more or less long, in which we can correctly assert that we are not aware of what we are thinking; we are in the presence of a thought in the same state of uncertainty as in that of an external, unknown, and novel object. The labour of classification and of interpretation cast upon us is of the same order; and, when this labour is effected incorrectly, it may end in an illusion. Therefore illusions of thought are quite as possible as illusions of the senses, though rarer for the reasons above stated. But the question of frequency has no theoretical importance.

I have shown elsewhere, by experiments on hysterics, that it is possible by the intermediary of their insensibility to touch to suggest ideas on the value of which the patients make mistakes. For instance, you take the finger in which they have no sensation, you touch it, you bend it. The patient, not seeing what is done, does not feel it, but the tactile sensation unfelt by their principal consciousness somehow awakes the visual image of the finger; this enters into the field of consciousness, and most often is not recognised by the subject, who describes the occurrence in his own way; he claims, for instance, that he thinks of sticks or of columns. In reality he does not know of what he is thinking, and we know better than he. He is thinking of his finger, and does not recognise it.

All these examples show that the clearly defined characteristics into which it is sought to divide extrospection and introspection do not exist. There is, however, a reason for preserving the distinction, because it presents a real interest for the psychology of the individual. These two words introspection and extrospection admirably convey the difference in the manner of thinking between those who from preference look, and those who from preference reflect. On the one hand, the observers, who are often men of action; on the other, the speculators, who are often mystics. But it would be no more legitimate by this means to separate psychology and physics than to say, for instance, "There are two kinds of geology: one is the geology of France, for one is acquainted with it without going from home, and the other is that of the rest of the world, because in order to know it one must cross the frontier."

We reject, therefore, the definition drawn from the difference of method. At bottom there is no difference of method, but only differences of process, of *technique*. The method is always the same, for it is derived from the application of a certain number of laws to the objects of cognition, and these laws remain the same in all spheres of application.

Here is another difference of method which, if it were true, would have an incalculable importance. Psychology, we are told, is a science of direct and immediate experiment; it studies facts as they present themselves to our consciousness, while the natural sciences are sciences of indirect and mediate experiment, for they are compelled to interpret the facts of consciousness and draw from them conclusions on nature. It has also been said, in a more ambitious formula, "The science of physical objects is relative; logical science is absolute."

Let us examine this by the rapid analysis of any perception taken at haphazard. What I perceive directly, immediately, we are told, is not the object, it is my state of consciousness; the object is inferred; concluded, and taken cognisance of through the intermediary of my state of consciousness. We only know it, says Lotze, *circa rem*. It is therefore apprehended less immediately, and every natural science employs a more roundabout method than that of psychology. This last, by studying states of consciousness, which alone are known to us directly, comprehends reality itself, absolute reality. "There is more absolute reality," M. Rabier boldly says, "in the simple feeling that a man, or even an animal, has of its pain when beaten than in all the theories of physics, for, beyond these theories, it can be asked, what are the things that exist. But it is an absurdity to ask one's self if, beyond the pain of which one is conscious, there be not another pain different from that one."[\[35\]](#)

Let us excuse in psychologists this petty and common whim for exaggerating the merit of the science they pursue. But here the limit is really passed, and no scholar will admit that the perception and representation of a body, as it may take place in the brain of a Berthelot, can present any inferiority as a cognition of the absolute, to the pain felt by the snail I crush under my foot. Nobody except metaphysicians will acknowledge that psychology is a more precise and certain science than physics or chemistry.

The criterion furnished by the development of the respective sciences would prove just the contrary. The observations of psychology are always rather unprecise. Psychological phenomena, notwithstanding the efforts of Fechner and his school, are not yet measured with the same strictness and ease as the tangible reality. To speak plainly, the psychologist who vaunts the superiority of his method, and only shows inferior results, places himself in a somewhat ridiculous and contradictory position; he deserves to be compared to those spiritualists who claim the power of evoking the souls of the illustrious dead and only get from them platitudes.

In the main the arguments of the metaphysicians given above appear to me to contain a grave error. This consists in supposing that the natural sciences study the reality hidden beneath sensation, and only make use of this fact as of a sign which enables them to get back from effect to cause. This is quite inexact. That the natural sciences are limited by sensation is true; but they do not go outside it, they effect their constructions with sensation alone. And the reason is very simple: it is the only thing they know. To the metaphysical psychologist, who claims sensation as his own property, saying, "But this sensation is a state of my consciousness, it is mine, it is myself," the physicist has the right to answer: "I beg your pardon! this sensation is the external object that I am studying; it is my column of mercury, my spring, my precipitate, my amœba; I comprehend these objects directly, and I want no other." Psychology finds itself, therefore, exactly on the same footing as the other sciences in the degree in which it studies sensations that it considers as its own property. I have already said that the sensations proper to psychology are hardly represented otherwise than by the emotional sensations produced by the storms in the apparatus of organic life.

We now come to the definitions by content. They have been numerous, but we shall only quote a few. The most usual consists in saying, that *Psychology studies the facts of consciousness*. This formula passes, in general, as satisfactory. The little objection raised against it is, that it excludes the unconscious facts which play so important a part in explaining the totality of mental life; but it only requires some usual phrase to repair this omission. One might add, for instance, to the above formula: conscious facts and those which, while unconscious under certain conditions, are yet conscious in others.

This is not, however, the main difficulty, which is far more serious. On close examination, it is seen that the term, *fact of consciousness*, is very elastic, and that for a reason easy to state. This is, that all facts which exist and are revealed to us reach us by the testimony of the consciousness, and are, consequently, facts of consciousness. If I look at a locomotive, and analyse its machinery, I act like a mechanic; if I study under the microscope the structure of infusoria, I practise biology; and yet the sight of the locomotive, the perception of the infusoria, are just facts of consciousness, and should belong to psychology, if one takes literally the above definition, which is so absolute that it absorbs the entire world into the science of the mind. It might, indeed, be remarked that certain phenomena would remain strictly psychological, such as, for instance, the emotions, the study of which would not be disputed by any physical science; for the world of nature offers us nothing comparable to an emotion or an effort of will, while, on the other hand, everything which is the object of physical science—that is, everything which can be perceived by our external senses—may be claimed by psychology. Therefore, it is very evident the above definition is much too wide, and does not agree with *solo definito*. It does not succeed in disengaging the essential characteristic of physics. This characteristic indeed exists, and we foresee it, but we do not formulate it.

Another definition by content has not been much more happy. To separate the material from the moral, the conception of Descartes was remembered, and we were told that: "Psychology is the science of what exists only in time, while physics is the science of what exists at once in time and in space."

To this theoretical reasoning it might already be objected that, in fact, and in the life we lead, we never cease to localise in space, though somewhat vaguely, our thought, our Ego, and our intellectual whole. At this moment I am considering myself, and taking myself as an example. I am writing these lines in my study, and no metaphysical argument can cause me to abandon my firm conviction that my intellectual whole is in this room, on the second floor of my house at Meudon. I am here, and not elsewhere. My body is here; and my soul, if I have one, is here. I am where my body is; I believe even that I am within my body.

This localisation, which certainly has not the exactness nor even the characteristics of the localisation of a material body in space, seems to me to result from the very great importance we attach, to the existence of our body in perception and in movement. Our body accompanies all our perceptions; its changes of position cause these perceptions to vary; the accidents which happen to it bring us pleasure or pain. Some of its movements are under our orders; we observe that others are the consequences of our thoughts and our emotions. It occupies, therefore, among the objects of cognition a privileged place, which renders it more intimate and more dear to us than other objects. There is no need to inquire here whether, in absolute reality, I am lodged within it, for this "I" is an artificial product manufactured from memories. I have before explained what is the value of the relation subject-object. It is indisputable that in the manufacture of the subject we bring in the body. This is too important an element for it not to have the right to form part of the synthesis; it is really its nucleus. As, on the other hand, all the other elements of the synthesis are psychical, invisible, and reduced to being faculties and powers, it may be convenient to consider them as occupying the centre of the body or of the brain. There is no need to discuss this synthesis, for it is one of pure convenience. As well inquire whether the personality of a public company is really localised at its registered offices, round the green baize cover which adorns the table in the boardroom.

Another definition of psychology, which is at once a definition by content and a definition by method, has often been employed by philosophers and physiologists. It consists in supposing that there really exist two ways of arriving at the cognition of objects: the within and the without. These two ways are as opposed to each other as the right and wrong side of a stuff. It is in this sense that psychology is the science of the within and looks at the wrong side of the stuff, while the natural sciences look at the right side. And it is so true, they add, that the same phenomenon appears under two radically different forms according as we look at it from the one or the other point of view. Thus, it is pointed out to us, every one of our thoughts is in correlation with a particular state of our cerebral matter; our thought is the subjective and mental face; the corresponding cerebral process is the objective and material face.

Then the difference between representation, which is a purely psychological phenomenon, and a cerebral state which is a material one, and reducible to movement, is insisted upon; and it is declared that these two orders of phenomena are separated by irreducible differences.

Lastly, to take account of the meaning of these differences, and to explain them, it is pointed out that they are probably connected with the modes of cognition which intervene to comprehend the mental and the physical. The mental phenomenon, we are told, is comprehended by itself, and as it is; it is known without any mystery, and in its absolute reality. The physical phenomenon, on the contrary, only reaches us through the intermediary of our nerves, more or less transformed in consequence by the handling in transport. It is an indirect cognition which causes us to comprehend matter; we have of this last only a relative and apparent notion, which sufficiently explains how it may differ from a phenomenon of thought.

I have already had occasion to speak of this dualism, when we were endeavouring to define sensation. We return to its criticism once more, for it is a conception which in these days has become classic; and it is only by repeatedly attacking it that it will be possible to demonstrate its error.

To take an example: I look at the plain before me, and see a flock of sheep pass over it. At the same time an observer is by my side and is not looking at the same thing as myself. It is not at the plain that he looks; it is, I will suppose, within my brain. Armed with a microscope *à la* Jules Verne, he succeeds in seeing what is passing beneath my skull, and he notices within my fibres and nerve cells those phenomena of undulation which physiologists have hitherto described hypothetically. This observer notices then, that, while I am looking over the plain, my optic nerve conveys a certain kind of movements—these are, I suppose, displacements of molecules which execute a complicated kind of dance. The movement follows the course of the optic nerve, traverses the chiasma, goes along the fascia, passes the internal capsule, and finally arrives at the visual centres of the occipital region. Here, then, are the two terms of comparison constituted: on the one hand, we have a certain representation—that is, my own; and on the other hand, coinciding with this representation we have the dynamic changes in the nerve centres. These are the two things constituting the right and wrong side of the stuff. We shall be told: "See how little

similarity there is here! A representation is a physical fact, a movement of molecules a material fact." And further, "If these two facts are so little like each other, it is because they reach us by two different routes."

I think both these affirmations equally disputable. Let us begin with the second. Where does one see that we possess two different sources of knowledge? Or that we can consider an object under two different aspects? Where are our duplicate organs of the senses, of which the one is turned inward and the other outward? In the example chosen for this discussion, I have supposed two persons, each of whom experiences a visual perception. One looks at one object, the other at another; but both are looking with the same organs of sense, that is, with their eyes. How is it possible to understand that these eyes can, in turn, according to the necessity of the moment, see the two faces, physical and mental, of the same object?

They are the two faces of an identical object, is the answer made to us, because the two visions, although applied to the same object, are essentially different. On the one hand is a sensation of displacement, of movement, of a dance executed by the molecules of some proteid substance; on the other hand is a flock of sheep passing over the plain at a distance of a hundred metres away.

It seems to me that here also the argument advanced is not sound. In the first place, it is essential to notice that not only are the two paths of cognition identical, but also that the perceptions are of the same nature. There is in this no opposition between the physical and the mental. What is compared are the two phenomena, which are both mixed and are physico-mental—physical, through the object to which they are applied, mental, through the act of cognition they imply. To perceive an object in the plain and to perceive a dynamic state of the brain are two operations which each imply an act of cognition; and, in addition, the object of this knowledge is as material in the one as in the other case. A flock of sheep is matter just as much as my brain.

No doubt, here are objects which differ; my observer and myself have not the same perception. I acknowledge, but do not wonder at it. How could our two perceptions be similar? I look at the sheep, and he at the interior of my brain. It is not astonishing that, looking at such different objects, we should

receive images also different. Or, again, if this other way of putting it be preferred, I would say: the individual A looks at the flock through the intermediary of his nervous system, while B looks at it through that of two nervous systems, put as it were end to end (though not entirely), his own nervous system first, and then that of A. How, then, could they experience the same sensation?

They could only have an identical sensation if the idea of the ancients were to be upheld, who understood the external perception of bodies to result from particles detaching themselves from their bodies, and after a more or less lengthy flight, striking and entering into our organs of sense.^[36]

Let us imagine, just for a moment, one of our nerves—the optic nerve, for instance—transformed into a hollow tube, along which the emissions of miniatures should wend their way. In this case, evidently, if so strange a disposition were to be realised, and if B could see what was flowing in the optic nerve of A, he would experience a sensation almost analogous to that of A. Whenever the latter saw a dog, a sheep, or a shepherd, B would likewise see in the optic canal minute dogs, microscopic sheep, and Lilliputian shepherds. At the cost of such a childish conception, a parity of content in the sensations of our two spectators A and B might be supposed. But I will not dwell on this.

The above considerations seem to me to explain the difference generally noticed between thought and the physiological process. It is not a difference of nature, an opposition of two essences, or of two worlds—it is simply a difference of object; just that which separates my visual perception of a tree and my visual perception of a dog. There remains to know in what manner we understand the relation of these two processes: this is another problem which we will examine later.

Since the content does not give us the differentiation we desire, we will abandon the definitions of psychology by content. What now remains? The definitions from the point of view. The same fact may be looked at, like a landscape, from different points of view, and appears different with the changes therein. It is so with the facts we consider psychological, and the autonomy of psychology would thus be a matter of point of view.

It has, then, been supposed—and this is a very important proposition—that the distinctive feature of psychical facts does not consist in their forming a class of particular events. On the contrary, their characteristic is to be studied in their dependency on the persons who bring them about. This interesting affirmation is not new: it may be read in the works of Mach, Külpe, Münsterberg, and, especially, of Ebbinghaus, from whom I quote the following lines of quite remarkable clearness: "Psychology is not distinguished from sciences like physics and biology, which are generally and rightly opposed to it, by a different content, in the way that, for instance, zoology is distinguished from mineralogy or astronomy. It has the same content, but considers it from a different point of view and with a different object. It is the science, not of a given part of the world, but of the whole world, considered, however, in a certain relation. It studies, in the world, those formations, processes, and relations, the properties of which are essentially determined by the properties and functions of an organism, of an organised individual.... Psychology, in short, considers the world from an individual and subjective point of view, while the science of physics studies it as if it were independent of us."

Over these definitions by point of view, one might quibble a little; for those who thus define psychology are not always consistent with themselves. In other passages of their writings they do not fail to oppose psychical to physiological phenomena, and they proclaim the irreducible heterogeneity of these two orders of phenomena and the impossibility of seeing in physics the producing cause of the moral. Ebbinghaus is certainly one of the modern writers who have most strongly insisted on this idea of opposition between the physiological and the psychical, and he is a convinced dualist. Now I do not very clearly understand in what the principle of heterogeneity can consist to a mind which admits, on the other hand, that psychology does not differ from the physical sciences by its content.

However, I confine myself here to criticising the consequences and not the starting point. The definition of the psychical phenomenon by the point of view seems to me correct, although it has more concision than clearness; for it rests especially upon a material metaphor, and the expression "point of view" hardly applies except to the changes of perspective furnished by visible objects.

It would be more exact to say that psychology specially studies certain objects of cognition, such as those which have the character of representations (reminiscences, ideas, concepts), the emotions, the volitions, and the reciprocal influences of these objects among themselves. It studies, then, a part of the material world, of that world which till now has been called psychological, because it does not come under the senses, and because it is subjective and inaccessible to others than ourselves; it studies the laws of those objects, which laws have been termed mental.[37]

These laws are not recognised, popularly speaking, either in physics or in biology; they constitute for us a cognition apart from that of the natural world. Association by resemblance, for example, is a law of consciousness; it is a psychological law which has no application nor counterpart in the world of physics or biology. We may therefore sum up what has been said by the statement that psychology is the study of a certain number of laws, relations, and connections.

As to the particular feature which distinguishes mental from physical laws, we can formulate it, as does William James, by saying that the essence of a mental law is to be teleological, or, if the phrase be preferred, we can say that mental activity is a finalistic activity, which expends itself as will in the pursuit of future ends, and as intelligence in the choice of the means deemed capable of serving those ends. An act of intelligence is recognised by the fact of its aiming at an end, and employing for this end one means chosen out of many. Finality and intelligence are thus synonymous. In opposition to mental law, physical law is mechanical, by which expression is simply implied the absence of finality. Finality opposed to mechanism; such is the most concise and truest expression in which must be sought the distinctive attribute of psychology and of the moral sciences, the essential characteristic by which psychological are separated from physical facts.

I think it may be useful to dwell a little on the mental laws which I have just opposed to the physical, and whose object is to assure preadaptation and form a finality.[38] Their importance cannot be exaggerated. Thanks to his power of preadaptation, the being endowed with intelligence acquires an enormous advantage over everything which does not reason. No doubt, as has been shrewdly remarked, natural selection resembles a finality, for it ends in an adaptation of beings to their surroundings. There is therefore,

strictly speaking, such a thing as finality without intelligence. But the adaptation resulting therefrom is a crude one, and proceeds by the elimination of all that does not succeed in adapting itself; it is a butchery. Real finalism saves many deaths, many sufferings, and many abortions.[39]

Let us examine, then, the process of preadaptation; it will enable us to thoroughly comprehend, not only the difference between the physical and the psychical laws, but the reason why the psychical manages in some fashion to mould itself upon the physical law.

Now, the means employed by preadaptation is, if we take the matter in its simplest form, to be aware of sensations before they are experienced. If we reflect that all prevision implies a previous knowledge of the probable trend of events, it will be understood that the part played by intelligence consists in becoming imbued with the laws of nature, for the purpose of imitating its workings. By the laws of nature, we understand here only that order of real sensations, the knowledge of which is sufficient to fulfil the wants of practical life. To us there are always gaps in this order, because the sensation it is important for us to know is separated from us either by the barriers of time or of space, or by the complication of useless sensations. Thence the necessity of interpolations. That which we do not perceive directly by our senses, we are obliged to represent to ourselves by our intelligence; the image does the work of sensation, and supplements the halting sensation in everything which concerns adaptation.

To replace the inaccessible sensation by the corresponding image, is therefore to create in ourselves a representation of the outer world which is, on all the points most useful to us, more complete than the direct and sensorial presentation of the moment. There is in us a power of creation, and this power exercises itself in the imitation of the work of nature; it imitates its order, it reconstitutes on the small scale adapted to our minds, the great external order of events. Now, this work of imitation is only really possible if the imitator has some means at his disposal analogous to those of the model.

Our minds could not divine the designs of nature, if the laws of images had nothing in common with the laws of nature. We are thus led to confront these two orders of laws with each other; but, before doing so, one more

preliminary word is necessary. We have up till now somewhat limited the problem, in order to understand it. We have reduced the psychological being to one single function, the intellectual, and to one single object of research, the truth. This is, however, an error which has often been committed, which is now known and catalogued, called intellectualism, or the abuse of intellectualism. It is committed for this very simple reason, that it is the intellectual part of our being which best allows itself to be understood, and, so to speak, intellectualised. But this leaves out of the question a part of our entire mental being so important and so eminent, that if this part be suppressed, the intelligence would cease to work and would have no more utility than a machine without motive power. Our own motive power is the will, the feeling, or the tendency. Will is perhaps the most characteristic psychical function, since, as I have already had occasion to say, nothing analogous to it is met with in the world of nature. Let us therefore not separate the will from the intelligence, let us incarnate them one in the other; and, instead of representing the function of the mind as having for its aim knowledge, foresight, the combination of means, and self-adaptation, we shall be much nearer the truth in representing to ourselves a being who *wills* to know, *wills* to foresee, and *wills* to adapt himself, for, after all, he *wills* to live.

Having said this, let us compare the psychological law and that of nature. Are they identical? We shall be told that they are not, since, as a fact, errors are committed at every moment by the sudden failures of human reason. This is the first idea which arises. Human error, it would seem, is the best proof that the two laws in question are not alike, and we will readily add that a falling stone does not mistake its way, that the crystal, in the course of formation does not miss taking the crystalline shape, because they form part of physical nature, and are subject in consequence to its determinism. But this is faulty reasoning, and a moment of reflection demonstrates it in the clearest possible manner; for adaptation may miss its aim without the being who adapts himself and his surroundings necessarily obeying different laws. When the heat of a too early spring causes buds to burst forth prematurely which are afterwards destroyed by frost, there is produced a fault of adjustment which resembles an error of adaptation, and the bringing forward of this error does not necessarily imply that the tree and the whole of physical nature are obeying different laws. Moreover, the difference

between the laws of nature and those of the understanding does not need deduction by reasoning from an abstract principle; it is better to say that it is directly observable, and this is how I find that it presents itself to us.

The essential law of nature is relatively easy to formulate, as it is comprised in the very definition of law. It simply consists in the sentence: uniformity under similar conditions. We might also say: a constant relation between two or several phenomena, which can also be expressed in a more abstract way by declaring that the law of nature rests on the combination of two notions, identity and constancy.

On the other hand, the laws of our psychical activity partly correspond to the same tendencies, and it would be easy to demonstrate that the microcosm of our thoughts is governed by laws which are also an expression of these two combined notions of constancy and identity. It is, above all, in the working of the intellectual machine, the best known and the most clearly analysed up till now, that we see the application of this mental law which resembles, as we say, on certain sides, the physical law: and the best we can do for our demonstration will doubtless be to dissect our reasoning powers. Reason, a process essential to thought in action, is developed in accordance with a law which resembles in the most curious manner a physical law. It resembles it enough to imitate it, to conform to it, and, so to speak, to mould itself on it.

Now, the reason does not follow the caprices of thought, it is subject to rules; it results from the properties of the images, those properties which we have above referred to, the material character of which we have recognised, and which are two in number—similarity and contiguity, as they are termed in the jargon of the schools. They are properties which have for their aim to bring things together, to unite, and to synthetise. They are unceasingly at work, and so apparent in their labour that they have long been known. We know, since the time of Aristotle, that two facts perceived at the same time reproduce themselves together in the memory—this is the law of contiguity; and that two facts perceived separately, but which are similar, are brought together in our mind—this is the law of similarity.

Now, similarity and contiguity form by combination the essential part of all kinds of reasoning, and this reasoning, thus understood, works in a fashion which much resembles (we shall see exactly in what degree) a physical law. I wish to show this in a few words. What renders my demonstration difficult and perhaps obscure is, that we shall be obliged to bring together rather unexpectedly categories of phenomena which are generally considered separate.

The distinctive attribute of the reason consists, as I have said, in the setting to work of these two elementary properties, similarity and contiguity. It consists, in fact, in extending continuity by similarity; in endowing with identical properties and similar accompaniments things which resemble each other; in other words, it consists in impliedly asserting that the moment two things are identical in one point they are so for all the rest. This will be fairly well understood by imagining what takes place when mental images having the above-mentioned properties meet. Suppose that B is associated with C, and that A resembles B. In consequence of their resemblance the passing from A to B is easy; and then B suggesting C by contiguity, it happens that this C is connected with A connected, though, in reality, they have never been tried together. I say they are associated on the basis of their relation to B, which is the rallying point. It is thus that, on seeing a piece of red-hot iron (A), I conclude it is hot (C), because I recollect distinctly or unconsciously another piece of red-hot iron (B), of which I once experienced the heat. It is this recollection B which logicians, in their analysis of logical, verbal, and formal argument, call the middle

term. Our representation of the process of reasoning is not special to argument. It also expresses the process of invention, and every kind of progress from the known to the unknown. It is an activity which creates relations, which assembles and binds together, and the connections made between different representations are due to their partial identities, which act as solder to two pieces of metal.

It will now be understood that these relations between the images curiously resemble the external order of things, the order of our sensations, the order of nature, the physical law. This is because this physical law also has the same character and expresses itself similarly. We might say "all things which resemble each other have the same properties," or "all things alike on one point resemble each other on all other points." But immediately we do so, the difference between the physical and the mental law becomes apparent. The formula we have given is only true on condition that many restrictions and distinctions are made.

The process of nature is so to do that the *same* phenomenon always unfolds itself in the same order. But this process is not always comprehended in real life, for it is hidden from our eyes by the manifold combinations of chance; in the reality that we perceive there is a crowd of phenomena which resemble each other but are not really the same. There are a number of phenomena which co-exist or follow each other without this order of co-existence or succession being necessary or constant. In other words, there are resemblances which are the marks of something, as a logician would say, and others which are not the marks of anything; there are relations of time and space which are the expression of a law; there are some which are accidental, and may possibly never be reproduced.

It would be a wonderful advantage if every scientific specialist would make out a list of the non-significant properties that he recognises in matter. The chemist, for example, would show us that specific weight has hardly any value in diagnosis, that the crystalline form of a salt is often not its own, that its colour especially is almost negligible because an immense number of crystals are white or colourless, that precipitation by a given substance does not ordinarily suffice to characterise a body, and so on. The botanist, on his part, would show us that, in determining plants, absolute dimension is less important than proportion, colour less important than form, certain

structures of organs less important than others. The pathologist would teach us that most pathological symptoms have but a trivial value; the cries, the enervation, the agitation of a patient, even the delirium which so affects the bystanders, are less characteristic of fever than the rate of his pulse, and the latter less than the temperature of the armpit or the dryness of the tongue, &c. At every moment the study of science reveals resemblances of facts and contiguities of facts which must be neglected for the sake of others. And if we pass from this profound knowledge of the objects to the empirical knowledge, to the external perception of bodies, it is in immense number that one espies around one traps laid by nature. The sound we hear resembles several others, all produced by different causes; many of our visual sensations likewise lend themselves to the most varied interpretations; by the side of the efficient cause of an event we find a thousand entangled contingencies which appear so important that to disentangle them we are as much perplexed as the savage, who, unable to discriminate between causes and coincidences, returns to drink at the well which has cured him, carefully keeping to the same hour, the same gestures, and the same finery.

The reason of this is that the faculty of similarity and the faculty of contiguity do not give the distinction, necessary as it is, between resemblances and co-existences which are significant and those which are not. The causal nexus between two phenomena is not perceived as something apart and *sui generis*; it is not even perceived at all. We perceive only their relation in time and space, and it is our mind which raises a succession to the height of a causal connection, by intercalating between cause and effect something of what we ourselves feel when we voluntarily order the execution of a movement. This is not the place to inquire what are the experimental conditions in which we subject phenomena to this anthropomorphic transformation; it will suffice for us to repeat here that, in perception, a chance relation between phenomena impresses us in the same way as when it is the expression of a law.

Our intellectual machine sometimes works in accord with the external law and at others makes mistakes and goes the wrong way. Then we are obliged to correct it, and to try a better adjustment, either by profounder experimenting with nature (methods of concordance, discordance, variations, &c.), or by a comparison of different judgments and arguments

made into a synthesis; and this collaboration of several concordant activities ends in a conclusion which can never represent the truth, but only the probable truth. The study of the laws of the mind shows us too clearly, in fact, their fluidity with regard to the laws of nature for us not to accept probabilism. There exists no certitude—only very varied degrees of probability. Daily practice contents itself with a very low degree of probability; judicial logic demands a rather higher one, especially when it is a question of depriving one of our fellow-creatures of liberty or life. Science claims one higher still. But there is never anything but differences of degrees in probability and conjecture.

This, then, is the definition of psychology that we propose. It studies a certain number of laws which we term mental, in opposition to those of external nature, from which they differ, but which, properly speaking, do not deserve the qualification of mental, since they are—or at least the best known of them are—laws of the images, and the images are material elements. Although it may seem absolutely paradoxical, psychology is a science of matter—the science of a part of matter which has the property of preadaptation.

FOOTNOTES:

[33] LANGE, *Histoire du Matérialisme*, II., 2me. partie, chap. iii.

[34] Let us remark, in passing, how badly nature has organised the system of communication between thinking beings. In what we experience we have nothing in common with our fellows; each one experiences his own sensations and not those of others. The only meeting point of different minds is found in the inaccessible domain of the *noumena*.

[35] E. RABIER, *Leçons de Philosophie*, "Psychologie," p. 33.

[36] This seems to have been the opinion of Democritus. The modern doctrine of radiation from the human body, if established, would go nearly as far as the supposition in the text. Up till now, however, it lacks confirmation.—ED.

[37] I am compelled, much against my will, to use throughout this passage an equivocal expression, that of "mental law," or law of consciousness, or psychological law. I indicate by this the laws of contiguity and of similarity; as they result from the properties of the images, and as these are of a material nature, they are really physical and material laws like those of external nature. But how can all these laws be called physical laws without running the risk of confusing them one with the other?

[38] *Finality* seems to be here used in the sense of the doctrine which regards perfection as the final cause of existence.—ED.

[39] See a very interesting article by E. GOBLOT, "La Finalité sans Intelligence," *Revue de Métaphysique*, July 1900.

BOOK III

THE UNION OF THE SOUL^[40] AND THE BODY

CHAPTER I

THE MIND HAS AN INCOMPLETE LIFE

The problem of the union of the mind and the body is not one of those which present themselves in pure speculation; it has its roots in experimental facts, and is forced upon us by the necessity of explaining observations such as those we are about to quote.

The force of our consciousness, the correctness of our judgments, our tempers and our characters, the state of health of our minds, and also their troubles, their weaknesses, and even their existence, are all in a state of strict dependence on the condition of our bodies, more precisely with that of our nervous systems, or, more precisely still, with the state of those three pounds of proteid substance which each of us has at the back of his forehead, and which are called our brains. This is daily demonstrated by thousands upon thousands of observations.

The question is to know how this union of the body with the consciousness is to be explained, it being assumed that the two terms of this union present a great difference in their nature. The easier it seems to demonstrate that this union exists, the more difficult it appears to explain how it is realised; and the proof of this difficulty is the number of divergent interpretations given to it. Were it a simple question of fact, the perpetual discussions and controversies upon it would not arise.

Many problems here present themselves. The first is that of the genesis or origin of the consciousness. It has to be explained how a psychological phenomenon can appear in the midst of material ones. In general, one begins by supposing that the material phenomena are produced first; they consist, for instance, in the working of the nervous centres. All this is physical or chemical, and therefore material. Then at a given moment, after this mechanical process, a quite different phenomenon emerges. This is thought, consciousness, emotion. Then comes the question whether this production of thought in the midst of physical phenomena is capable of

explanation, and how thought is connected with its physical antecedents. What is the nature of the link between them? Is it a relation of cause to effect, of genesis? or a coincidence? or the interaction of two distinct forces? Is this relation constant or necessary? Can the mind enjoy an existence independent of the brain? Can it survive the death of the brain?

The second question is that of knowing what is the rôle, the utility, and the efficacy of the psychical phenomenon. Once formed, this phenomenon evolves in a certain direction and assumes to us who have consciousness of it a very great importance. What is its action on the material phenomena of the brain which surround it? Does it develop according to laws of its own, which have no relation to the laws of brain action? Does it exercise any action on these intra-cerebral functions? Does it exercise any action on the centrifugal currents which go to the motor nerves? Is it capable of exciting a movement? or is it deprived of all power of creating effect?

We will briefly examine the principal solutions which the imagination of mankind has found for these very difficult problems. Some of the best known of these solutions bear the names of spiritualism, materialism, parallelism, and monism. We will speak of these and of some others also.

Before beginning our critical statement, let us recall some of the results of our previous analyses which here intrude themselves, to use the ambitious language of Kant, as the prolegomena to every future solution which claims the title of science. In fact, we are now no longer at the outset of our investigation. We have had to acknowledge the exactness of certain facts, and we are bound to admit their consequences. Notably, the definition of psychical phenomena at which we arrived, not without some trouble, will henceforth play a rather large part in our discussion. It will force us to question a great metaphysical principle which, up till now, has been almost universally considered as governing the problem of the union of the mind with the body.

This principle bears the name of the *axiom of heterogeneity*, or the principle of *psycho-physical dualism*. No philosopher has more clearly formulated it, and more logically deduced its consequences, than Flournoy. This author has written a little pamphlet called *Métaphysique et Psychologie*, wherein he briefly sets forth all the known systems of metaphysics by reducing them

to the so-called principle of heterogeneity; after this, the same principle enables him to "execute" them. He formulates it in the following terms: "body and mind, consciousness and the molecular cerebral movement of the brain, the psychical fact and the physical fact, although simultaneous, are heterogeneous, unconnected, irreducible, and obstinately two."^[41] The same author adds: "this is evident of itself, and axiomatic. Every physical, chemical, or physiological event, in the last resort, simply consists, according to science, in a more or less rapid displacement of a certain number of material elements, in a change of their mutual distances or of their modes of grouping. Now, what can there be in common, I ask you, what analogy can you see, between this drawing together or moving apart of material masses in space, and the fact of having a feeling of joy, the recollection of an absent friend, the perception of a gas jet, a desire, or of an act of volition of any kind?" And further on: "All that we can say to connect two events so absolutely dissimilar is, that they take place *at the same time*.... This does not mean that we wish to reduce them to unity, or to join them together by the link of causality ... it is impossible to conceive any real connection, any internal relation between these two unconnected things."

Let us not hesitate to denounce as false this proposition which is presented to us as an axiom. On looking closely into it, we shall perceive that the principle of heterogeneity does not contain the consequences it is sought to ascribe to it. It seems to me it should be split up into two propositions of very unequal value: 1, the mind and body are heterogeneous; 2, by virtue of this heterogeneity it is not possible to understand any direct relation between the two.

Now, if the first proposition is absolutely correct, in the sense that consciousness and matter are heterogeneous, the second proposition seems to us directly contrary to the facts, which show us that the phenomena of consciousness are incomplete phenomena. The consciousness is not sufficient for itself; as we have said, it cannot exist by itself. This again, if you like, is an axiom, or rather it is a fact shown by observation and confirmed by reflection. Mind and matter brought down to the essential, to the consciousness and its object, form a natural whole, and the difficulty does not consist in uniting but in separating them. Consider the following fact: "I experience a sensation, and I have consciousness of it." This is the coupling of two things—a sensation and a cognition.

The two elements, if we insist upon it, are heterogeneous, and they differ qualitatively; but notwithstanding the existing prejudice by reason of which no direct relation, no commerce, can be admitted between heterogeneous facts, the alliance of the consciousness and the sensation is the natural and primitive fact. They can only be separated by analysis, and a scrupulous mind might even ask whether one has the right to separate them. I have a sensation, and I have consciousness of it. If not two facts, they are one and the same. Now, sensation is matter and my consciousness is mind. If I am judging an assortment of stuffs, this assortment, or the sensation I have of them, is a particle of matter, a material state, and my judgment on this sensation is the psychical phenomenon. We can neither believe, nor desire, nor do any act of our intelligence without realising this welding together of mind and matter. They are as inseparable as motion and the object that moves; and this comparison, though far-fetched, is really very convenient. Motion cannot exist without a mobile object; and an object, on the other hand, can exist without movement. In the same way, sensation may exist without the consciousness; but the converse proposition, consciousness without sensation, without an object, an empty consciousness or a "pure thought," cannot be understood.

Let us mark clearly how this union is put forward by us. We describe it after nature. It is observation which reveals to us the union and the fusion of the two terms into one. Or, rather, we do not even perceive their union until the moment when, by a process of analysis, we succeed in convincing ourselves that that which we at first considered single is really double, or, if you like, can be made into two by the reason, without being so in reality. Thus it happens that we bring this big problem in metaphysics on to the field of observation.

Our solution vaguely resembles that which has sometimes been presented under the ancient name of *physical influx*, or under the more modern name of *inter-actionism*. There are many authors who maintain that the soul can act directly on the body and modify it, and this is what is called inter-actionism. Thereby is understood, if I mistake not, an action from cause to effect, produced between two terms which enjoy a certain independence with regard to each other. This interpretation is indubitably close to ours, though not to be confused with it. My personal interpretation sets aside the

idea of all independence of the mind, since it attributes to the mind an incomplete and, as it were, a virtual existence.

If we had to seek paternity for ideas I would much rather turn to Aristotle. It was not without some surprise that I was able to convince myself that the above theory of the relations between the soul and the body is to be found almost in its entirety in the great philosopher. It is true that it is mixed up with many accessory ideas which are out of date and which we now reject; but the essential of the theory is there very clearly formulated, and that is the important point. A few details on this subject will not be out of place. I give them, not from the original source, which I am not erudite enough to consult direct, but from the learned treatise which Bain has published on the psychology of Aristotle, as an appendix to his work on the Senses and the Intelligence.

The whole metaphysics of Aristotle is dominated by the distinction between form and matter. This distinction is borrowed from the most familiar fact in the sensible world—the form of solid objects. We may name a substance without troubling ourselves as to the form it possesses, and we may name the form without regard to the substance that it clothes. But this distinction is a purely abstract one, for there can be no real separation of form from matter, no form without matter, and no matter without form. The two terms are correlative; each one implies the other, and neither can be realised or actualised without the other. Every individual substance can be considered from a triple point of view: 1st, form; 2nd, matter; and 3rd, the compound or aggregate of form and matter, the inseparable *Ens*, which transports us out of the domain of logic and abstraction into that of reality.

Aristotle recognises between these two logical correlatives a difference in rank. Form is superior, nobler, the higher in dignity, nearer to the perfect entity; matter is inferior, more modest, more distant from perfection. On account of its hierarchical inferiority, matter is often presented as the second, or *correlatum*, and form as the first, or *relatum*. This difference in rank is so strongly marked, that these two correlations are likewise conceived in a different form—that of the potential and the actual. Matter is the potential, imperfect, roughly outlined element which is not yet actual, and may perhaps never become so. Form is the actual, the energy, the entelechy which actualises the potential and determines the final compound.

These few definitions will make clear the singularly ingenious idea of Aristotle on the nature of the body, the soul, and of their union. The body is matter which is only intelligible as the *correlatum* of form; it can neither exist by itself nor be known by itself—that is to say, when considered outside this relation. The soul is form, the actual. By uniting with the body it constitutes the living subject. The soul is the *relatum*, and is unintelligible and void of sense without its *correlatum*. "The soul," says Aristotle, "is not a variety of body, but it could not exist without a body: the soul is not a body, but something which belongs or is relative to a body." The animated subject is a form plunged and engaged in matter, and all its actions and passions are so likewise. Each has its formal side which concerns the soul, and its material side which concerns the body. The emotion which belongs to the animated subject or aggregate of soul and body is a complex fact having two aspects logically distinguishable from each other, each of which is correlative to the other and implies it. It is thus not only with our passions, but also with our perceptions, our imaginations, reminiscences, reasonings, and efforts of attention to learn. Intelligence, like emotion, is a phenomenon not simply of the corporeal organism nor of the *Nous* only, but of the commonalty or association of which they are members, and when the intelligence weakens it is not because the *Nous* is altered, but because the association is destroyed by the ruin of the corporeal organism.

These few notes, which I have taken in their integrity from Bain's text, allow us thoroughly to comprehend the thought of Aristotle, and it seems to me that the Greek philosopher, by making of the soul and body two correlative terms, has formed a comparison of great exactness. I also much admire his idea according to which it is through the union of the body and soul that the whole, which till then was only possible, goes forth from the domain of logic and becomes actual. The soul actualises the body, and becomes, as he said, its entelechy.

These views are too close to those I have myself just set forth for it to be necessary to dwell on their resemblance. The latter would become still stronger if we separated from the thought of Aristotle a few developments which are not essential, though he allowed them great importance: I refer to the continual comparison he makes with the form and matter of corporeal objects. Happy though it may be, this comparison is but a metaphor which perhaps facilitates the understanding of Aristotle's idea, but is not essential

to his theory. For my part, I attach far greater importance to the character of *relatum*, and *correlatum* ascribed to the two terms mind and matter, and to the actualisation^[42] produced by their union.

Let me add another point of comparison. Aristotle's theory recalls in a striking manner that of Kant on the *a priori* forms of thought. The form of thought, or the category, is nothing without the matter of cognition, and the latter is nothing without the application of form. "Thoughts without content given by sensation are empty; intuitions without concept furnished by the understanding are blind." There is nothing astonishing in finding here the same illustration, since there is throughout a question of describing the same phenomenon,—the relation of mind to matter.

There remains to us to review the principal types of metaphysical systems. We shall discuss these by taking as our guide the principle we have just evolved, and which may be thus formulated: *The phenomena of consciousness constitute an incomplete mode of existence.*

FOOTNOTES:

[40] See [Note 1] on p. 3.

[41] For reference, see [Note 18] on p. 73. —ED.

[42] *i.e.* rendering actual.—ED.

CHAPTER II

SPIRITUALISM^[43] AND IDEALISM

Flournoy has somewhere written that the chief interest of the systems of metaphysics lies less in the intellectual constructions they raise than in the aspirations of the mind and of the heart to which they correspond. Without taking literally this terribly sceptical opinion, it would be highly useful to begin the study of any metaphysical system by the psychology of its author. The value of each system would be better understood, and their reasons would be comprehended.

This book is too short to permit us to enter into such biographical details. I am obliged to take the metaphysical systems *en bloc*, as if they were anonymous works, and to efface all the shades, occasionally so curious, that the thought of each author has introduced into them. Yet, however brief our statement, it seems indispensable to indicate clearly the physical or moral idea concealed within each system.

SPIRITUALISM

It is known that spiritualism is a doctrine which has for its chief aim the raising of the dignity of man, by recognising in him faculties superior to the properties of matter. We constantly meet, in spiritualism, with the notion of superior and inferior, understood not only in an intellectual sense but also in the sense of moral worth.

It will also be remarked, as a consequence of the above principle, that a spiritualist does not confine himself to discussing the ideas of his habitual adversary, the materialist; he finds them not only false, but dangerous, and is indignant with them; some persons even ingenuously acknowledge that they hold firmly to certain principles because they fear to be converted to materialism. I can also discern in this system a very natural horror of death, which inspires in so many people, of whom I am one, both hatred and disgust. The spiritualist revolts against the prospect of a definitive

annihilation of thought, and the system he adopts is largely explained as an effort towards immortality.

This effort has led to the theory of two substances, the soul and the body, which are represented as being as thoroughly separated as possible. The soul has not its origin in the body, and it derives none of its properties from its fellow; it is a substance created in complete independence relatively to the body; the soul, in its essence, has nothing in common with matter. The essence of the soul, said Descartes, is thought; the essence of the body is extent. It follows from this that the soul, in its determinations and actions, is liberated from the laws and necessities of the corporeal nature; it is a free power, a power of indetermination, capable of choice, capable of introducing new, unforeseen, and unforeseeable actions, and on this point opposes itself to corporeal phenomena, which are all subject to a determinism so rigorous that any event could be foreseen if its antecedents were known. Another consequence of spiritualism is the admission of the immortality of the soul, which, being widely distinct from the body, is not affected by its dissolution; it is, on the contrary, liberated, since death cuts the link which binds them together.

But there is a link, and the explanation of this link brings with it the ruin of the whole system. One is forced to admit that this principle of the separation of body and soul is liable, in fact, to many exceptions. Even if they are two isolated powers, the necessities of life oblige them to enter continually into communication with each other. In the case of perceptions, it is the body which acts on the soul and imparts sensations to it; in movements, it is the soul, on the contrary, which acts on the body, to make it execute its desires and its will.

Spiritualists must acknowledge that they are at some trouble to explain this traffic between the two substances; for, with their respect for the principle of heterogeneity mentioned above, they do not manage to conceive how that contact of the physical and the mental can be made which is constantly necessary in the life of relation. By what means, have they long asked themselves, can that which is only extent act on that which is only thought? How can we represent to ourselves this *local* union of matter with an immaterial principle, which, by its essence, does not exist in space? The two substances have been so completely separated, to insure the liberty of

the soul and its superiority over the body, that it has become impossible to bring them together. The scission has been too complete. They cannot be sewn together again.

Such are the principal objections raised against spiritualism. These objections are derived from points of view which are not ours, and we have therefore no need to estimate their value.

From our point of view, the spiritualist conception has chosen an excellent starting point. By establishing the consciousness and the object of cognition as two autonomous powers, neither of which is the slave of the other, spiritualism has arrived at an opinion of irreproachable exactness; it is indeed thus that the relations of these two terms must be stated; each has the same importance and the right to the same autonomy.[44]

Yet, spiritualism has not rested there, and, by a lamentable exaggeration, it has thought that the consciousness, which it calls the soul, could exercise its functions in complete independence of the object of cognition, which it calls matter. There is the error. It consists in misunderstanding the incomplete and, as it were, virtual existence of the consciousness. This refutation is enough as regards spiritualism. Nothing more need be added.

IDEALISM

Idealism is an exceedingly complex system, varying much with varying authors, very polymorphous, and consequently very difficult to discuss.

The ancient hylozoism, the monadism of Leibnitz, and the recent panpsychism of M. Strong are only different forms of the same doctrine.

Like spiritualism, with which it is connected by many ties, idealism is a philosophy which expresses some disdain for matter, but the thoughts which have sought to shelter themselves under this philosophy are so varied that it would be perilous to try to define them briefly.

There can be discussed in idealism a certain number of affirmations which form the basis of the system. None of these affirmations is, strictly speaking, demonstrated or demonstrable; but they offer very different degrees of probability, and it is for this reason that we shall notice them.

Amongst these affirmations there are some that we have already met with in our study of the definition of sensation; others will be newer to us.

1. Here is one which seems to arise directly from the facts, and appears for a long time to have constituted an impregnable position for idealists. It may be expressed in three words: *esse est percipi*.

Starting with the observation that every time we bear witness to the existence of the external world, it is because we perceive it, idealists admit that the existence of this external world shares exactly the lot of our perception, and that like it it is discontinuous and intermittent. When we close our eyes, it ceases to exist, like a torch which is extinguished, and lights up again when we open them. We have already discussed this proposition, and have shown that it contains nothing imperative; and we may very well decline to subscribe to it.

2. There follows a second proposition, barely distinct from the previous one. There should be nothing else in objects but that which we perceive, and that of which we have consciousness should be, in the fullest possible acceptation of the words, the measure of what is. Consequently there should be no need to seek, under the object perceived, another and larger reality, a source from which might flow wider knowledge than that we at present possess. This is as disputable as the preceding affirmation, and for the same reasons.

3. The third proposition is the heart of the idealist thesis. It is sometimes presented as a deduction from the foregoing, but it is nevertheless thoroughly distinct from it, and the preceding affirmations might legitimately be accepted and this new one rejected. This proposition may be expressed thus: *Everything that is perceived is psychical*.

It is not only idealists who subscribe to this opinion, however, and we have seen, when dealing with the definition of matter, that it is widely spread. We understand by it that the objects we perceive exist in the consciousness, are of the consciousness, and are constituted by ideas; the whole world is nothing but idea and representation; and, since our mind is taken to be of a psychical nature, the result is that everything, absolutely everything, the person who knows and the thing known, are all psychical. This is panpsychism. Flournoy, on this point, says, with a charm coloured by irony:

"We henceforth experience a sweet family feeling, we find ourselves, so to speak, *at home* in the midst of this universe ..." [45] We have demonstrated above that the unity here attained is purely verbal, since we cannot succeed in suppressing the essential differences of things.

4. Now comes an affirmation on the genesis of things. After having admitted that the object is an idea of the mind, one of its manifestations, or one of its moods, the idealists go so far as to say that the consciousness is the generating power of ideas, and, consequently, the generating cause of the universe. It is thought which creates the world. That is the final conclusion.

I indicated, beforehand, in the chapters on the definition of sensation and on the distinction between the consciousness and the object, the reasons which lead me to reject the premises of idealism. It will be sufficient to offer here a criticism on its last conclusion: "It is the mind that creates the world."

This thesis strikes at the duality—consciousness and object; it gives the supremacy to the consciousness by making of the object an effect or property of the former. We can object that this genesis cannot be clearly represented, and that for the very simple reason that it is impossible to clearly accept "mind" as a separate entity and distinct from matter. It is easy to affirm this separation, thanks to the psittacism of the words, which are here used like counterfeit coin, but we cannot represent it to ourselves, for it corresponds to nothing. The consciousness constitutes all that is mental in the world; nothing else can be described as mental. Now this consciousness only exists as an act; it is, in other terms, an incomplete form of existence, which does not exist apart from its object, of which the true name is matter. It is therefore very difficult to understand this affirmation, "It is the mind that creates the world," since to be able to do so, we should have to imagine a consciousness without an object.

Moreover, should we even succeed in doing so, we should be none the more disposed, on that account, to give assent to this proposition. Consciousness and matter represent to us the most different and antithetical terms of the whole of the knowable. Were the hypothesis to be advanced that one of these elements is capable of engendering the other, we should immediately have to ask ourselves why this generating power and this pre-eminence

should be attributed to one rather than to the other element. Who can claim that one solution is more clear, more reasonable, or more probable than the other?

One of the great advantages of the history of philosophy here asserts itself. This history shows us that different minds when reflecting on the same problems have come to conceive solutions which have appeared to them clear, and consequently were possible; now, as these solutions are often contradictory, nothing shows better than their collation the distance between possibility and fact. Thus the materialists, who, like the idealists, have put forward a genetic theory of the mind, have conceived mind as produced by matter;—a conception diametrically opposed to that of the idealists. It may be said that these two conceptions, opposed in sense, annul each other, and that each of these two philosophical systems has rendered us service by demonstrating the error of the opposing system.

FOOTNOTES:

[43] It is, perhaps, needless to point out that by "spiritualism" M. Binet does not mean the doctrine of the spirit-rappers, whom he, like other scientific writers, designates as "spiritists," but the creed of all those who believe in disembodied spirits or existences.—ED.

[44] I do not insist on the difference between my conception and the spiritualistic conception; my distinction between consciousness and matter does not correspond, it is evident, to that of "facts of consciousness" and "physical facts" which spiritualism sets up.

[45] *Archives de Psychologie*, vol. iv. No. 14, Nov. 1904, p. 132 (article on Panpsychism).

CHAPTER III

MATERIALISM AND PARALLELISM

MATERIALISM

Materialism is a very ancient doctrine. It is even the most ancient of all, which simply proves that amongst the different explanations given of our double physico-mental nature, this doctrine is the easiest to understand. The origin of materialism is to be found in the beliefs of savage tribes, and is again found, very clearly defined, in the philosophy of those ancient Greeks who philosophized before Plato and Aristotle. A still stranger fact is that the thoughts of a great number of the Fathers of the Church inclined towards the philosophy of matter. Then, in the course of its evolution, there occurred a moment of eclipse, and materialism ceased to attract attention till the contemporary period in which we assist at its re-birth. Nowadays, it constitutes a powerful doctrine, the more so that it has surreptitiously crept into the thoughts of many learned men without their being clearly conscious of it. There are many physicists and physiologists who think and speak as materialists, though they have made up their minds to remain on the battleground of observed facts and have a holy horror of metaphysics. In a certain sense, it may be said that materialism is the metaphysics of those who refuse to be metaphysicians.

It is very evident that in the course of its long history, materialism has often changed its skin. Like all knowledge, it has been subject to the law of progress; and, certainly, it would not have been of a nature to satisfy the intellectual wants of contemporary scholars, had it not stripped itself of the rude form under which it first manifested itself in the mind of primitive man. Yet what has enabled the doctrine to keep its unity through all its changes is that it manifests a deeply human tendency to cling by preference to everything visible and tangible.

Whatever strikes the eyes, or can be felt by the hand, seems to us in the highest degree endowed with reality or existence. It is only much later, after

an effort of refined thought, that we come to recognise an existence in everything that can be perceived in any way whatever, even in an idea. It is still later that we understand that existence is not only that which is perceived but also that which is linked logically with the rest of our knowledge. A good deal of progress has been necessary to reach this point.

As I have not the slightest intention of giving even an abridged history of materialism, let us come at once to the present day, and endeavour to say in what consists the scientific form this doctrine has assumed. Its fundamental basis has not changed. It still rests on our tendency to give chief importance to what can be seen and touched; and it is an effect of the hegemony of three of our senses, the visual, the tactile, and the muscular.

The extraordinary development of the physical sciences has no doubt given an enormous encouragement to materialism, and it may be said that in the philosophy of nature it occupies a principal place, and that it is there in its own domain and unassailable.

It has become the expression of the idea that everything that can be explained scientifically, everything susceptible of being measured, is a material phenomenon. It is the representation of the material explanation pushed to its last limits, and all experiments, all calculations, all inductions resting on the grand principle of the conservation of matter and energy plead in its favour.

We will examine with some precision how far such a doctrine solves the problem of the existence of the intellectual functions.

The doctrine has understood this connection as being purely material, and has sought its image in other phenomena which are entirely so. Thus, it has borrowed from physiology the principle of its explanation, it has transported into the domain of thought the idea of function, and it has supposed that the soul is to the body in the relation of function to organ. Intelligence would thus be a cerebral function. To explain intelligence, materialists link it with matter, turn it into a property of matter, and compare it to a movement of matter, and sometimes even to a secretion. So Karl Vogt, the illustrious Genevan naturalist, one day declared, to the great scandal of every one, that the brain secretes the thought as the kidney does urine. This bold comparison seemed shocking, puerile, and false, for a

secretion is a material thing while thought is not. Karl Vogt also employed another comparison: the brain produces the thought as the muscle produces movement, and it at once seems less offensive to compare the thought to a movement than to compare it to a liquid secretion. At the present day, an illustration still more vague would be used, such as that of a transformation of energy: chemical energy disengaged by the nerve centres would be thus looked upon as transformed into psychological energy.

However, it matters little what metaphors are applied to for help in explaining the passage from the physical to the mental. What characterises materialist philosophy is its belief in the possibility of such a passage, and its considering it as the genesis of thought. "One calls materialist," says Renouvier, with great exactness, "every philosophy which defines thought as the product of a compound whose elements do not imply thought." A sweeping formula which allows us to foresee all the future avatars of the materialist doctrine, and to class them beforehand in the same category.

The criticisms which have been directed against materialism are all, or nearly all, variations of the principle of heterogeneity. We will not dwell long on this, but simply recollect that, according to this principle, it is impossible to attribute to the brain the capacity of generating consciousness. Physical force can indeed generate physical force under the same or a different form, and it thus produces all the effects which are determined by the laws of nature. But it is impossible to comprehend how physical force can enrich itself at a given moment by a conscious force. Physical force is reduced to movements of bodies and to displacements of atoms; how could a change of position in any inert objects give rise to a judgment, a reasoning, or any phenomenon of the consciousness? It is further said: this idea of function, which materialists here introduce to render more comprehensible the passage from a material body to a spiritual action, contains only an empty explanation, for the function is not essentially distinct by its nature from the organ; it is simply "the organ in activity," it adds to the organ taken in a state of repose but one change, viz. activity, that is to say movement, and, consequently, the function of an organ is material by the same right as the organ. When a muscle contracts, this contraction, which is the proper function of the muscular fibre, consists in a condensation of the muscular protoplasm, and this condensation is a material fact. When a gland enters into activity, a certain quantity of liquid

flows into the channels of the gland, and this liquid is caused by a physical and chemical modification of the cellular protoplasm; it is a melting, or a liquefaction, which likewise is material. The function of the nerve cell is to produce movement, or to preserve it, or to direct it; it is material like the cells. There is therefore nothing in all those functional phenomena which might lead us to understand how a material cause should be capable of engendering a conscious effect.

It seems that all materialists have acknowledged that here is the vulnerable point in their theory, for it is the principle of heterogeneity which they have especially combated. But their defence is wanting in frankness, and principally consists in subterfuges.

In brief, it affirms that we are surrounded with mystery, that we are not sufficiently learned to have the right to impose limits to the power of matter, and to say to it: "Thou shalt not produce this phenomenon." A materialist theologian declares that he sees no impossibility in stones thinking and arguing, if God, in His infinite power, has decided to unite thought with brute matter. This argument is not really serious; it demands the intervention of so powerful a *Deus ex machina*, that it can be applied equally to all problems; to solve all is to solve none.

Modern materialists rightly do not bring God into the question. Their mode of argument takes another form; but it remains to be seen if, at bottom, it is not the same as the other. It simply consists in affirming that up till now we know certain properties of matter only, but that science every day discovers new ones; that matter is a reservoir of unknown forces, and that it is not impossible that the origin of psychical forces may yet be discovered in matter. This idea is clearly hinted at by Littré. The physicist Tyndall gave it a definite formula when he uttered at the Belfast Congress this phrase so often quoted: "If I look back on the limits of experimental science, I can discern in the bosom of that matter (which, in our ignorance, while at the same time professing our respect for its Creator, we have, till now, treated with opprobrium) the promise and the power of all forms and qualities of life."

The opponents of the doctrine have not ceased to answer that the matter of to-morrow, like the matter of to-day, can generate none but material effects,

and that a difficulty is not solved by putting off its solution to some indefinite date in our scientific evolution: and it certainly seems that the counter-stroke is decisive, if we admit the principle of heterogeneity with its natural consequence.

We will now criticise the above doctrine by making use of the ideas I have above enunciated. The criticism we have to apply to materialism is not the same as that just summarised. The axis of the discussion changes its position.

In the first place, I reproach materialism with presenting itself as a theory of the generation of the consciousness by the object. We have already reproached idealism with putting itself forward as a theory of the generation of the object by the consciousness. The error of the two systems is produced in a converse direction, but is of the same gravity. The consciousness and its object, we say yet again, constitute the widest division it is possible to effect in the domain of cognition; it is quite as illegitimate to reduce the first term to the second as to reduce the second to the first. To reduce one to the other, by way of affiliation or otherwise, there must first be discovered, then, an identity of nature which does not exist.

In the second place, when one examines closely the explanation materialism has imagined in order to derive thought from an action of matter, it is seen that this representation is rendered completely impossible by all we know of the nature of thought. For the materialist to suppose for one moment that thought is a cerebral function, he must evidently make an illusion for himself as to what thought is, and must juggle with concepts. Perhaps, could we penetrate into his own inmost thought, we should discover that at the moment he supposes a mere cell can manufacture the phenomena of consciousness, some vague image suggests itself to him whereby he identifies these phenomena with a light and subtle principle escaping from the nerve cell, something which resembles an electric *effluve*, or a will-of-the-wisp, or the flame from a punch-bowl.^[46]

I cannot, of course, tell whether my supposition is correct. But what I assert, with the calmness of perfect certitude, is that the materialist has not taken the pains to analyse attentively what he calls the phenomenon of consciousness. Had he made this analysis and kept the elements in his

mind, he would have seen that it is almost impossible to hook in any way a phenomenon of consciousness on to a material molecule.

In fact, also, to take this into account, we will not remain within the vagueness of the concept, but will take a particular example to argue upon, viz. that of an external perception. I open my window on a fine day, and I see before me a sunny plain, with, as far as the eye can reach, houses amongst the trees, and again more houses, the most distant of which are outlined against my far-off horizon. This is my mental phenomenon. And while I am at my window, my eyes fixed on the view, the anatomist declares that, starting from my retina, molecular vibrations travel along the optic nerve, cross each other at the chiasma, enter into the fascia, pass through the internal capsule and reach the hemispheres, or rather the occipital regions, of the brain, where, for the moment, we agree to localise the centre of projection of the visual sensations. This is my physical phenomenon. It now becomes the question of passing from this physical phenomena to the mental one. And here we are stopped by a really formidable difficulty.

My mental phenomenon is not entirely mental, as is usually supposed from the deceitful brevity of the phrase. It is in great part physical, for it can be decomposed into two elements, a consciousness and its object; and this object of the consciousness, this group of little houses I see in the plain, belongs to sensation—that is to say, to something physical—or, in other words, to matter.

Let us examine in its turn the physical process which is supposed to be discovered in my nervous centres while I am in course of contemplating the landscape. This pretended physical process itself, quite as much as my conscious perception of the landscape, is a physico-psychical phenomenon; for my cerebral movements are perceived, hypothetically at least, by an observer. This is a perception, consequently it can be decomposed into two things, a consciousness and its object. As a further consequence, when we wish, by a metaphysical effort, to attach the consciousness to a material state of the brain and to establish a link between the two events, it will be found that we wrongly hook one physico-mental phenomenon on to another.

But, evidently, this objection is not a refutation. We may if we choose suppose that the so-called cerebral process is capable of subsisting at moments when no one perceives it, and that it exists of itself, is sufficient for itself, and is entirely physical. But can we subject the mental process of perception to the same purification? Can we separate these two elements, the consciousness and its object, retain the element consciousness and reject the element object, which is physical, thus constituting a phenomenon entirely mental, which might then be possibly placed beside the entirely physical phenomenon, so as to study their relation to each other? This is quite impossible, and the impossibility is double, for it exists *de facto* and *de jure*.

De jure, because we have already established that a consciousness empty and without object cannot be conceived. *De facto*, because the existence of the object that consciousness carries with it is very embarrassing for the materialist; for this object is material, and as real and material as the fibres and cells of the brain. It might, indeed, be supposed that by transformation or otherwise there goes forth from the cerebral convolution a purely psychical phenomenon resembling a wave. But how can we conceive the transformation of this convolution into a semi-material phenomenon? How can we comprehend that there should issue from this convolution the material object of a perception—for example, a plain dotted with houses?

An English histologist remarked one day, with some eloquence, how little the most minute study of the brain aided us to understand thought. He was thus answering Auguste Comte, who, in a moment of aberration, claimed that psychology, in order to become a science, ought to reject the testimony of the consciousness, and to use exclusively as its means of study the histology of the nerve centres and the measurement of the cranium. Our histologist, who had passed part of his life examining, under the microscope, fragments of cerebral matter, in following the forms of the cells, the course of the fibres, and the grouping and distribution of the fascia, made the following remark: "It is the fact that the study, however patient, minute, and thorough it might be, of this nerve-skein can never enable us to know what a state of consciousness is, if we do not know it otherwise; for never across the field of the microscope is there seen to pass a memory, an emotion, or an act of volition." And, he added, "he who confines himself to peering into these material structures remains as

ignorant of the phenomena of the mind as the London cabman who, for ever travelling through the streets of the great city, is ignorant of what is said and what is going on in the interior of the houses." This picturesque comparison, the truth of which has never been questioned, is based on this supposition, that the psychical act is entirely immaterial and invisible, and therefore escapes the piercing eye of the microscope. But a deeper analysis of the mind shows how little exact is this assertion. From the moment each psychical act implies a material object, we can ask ourselves two things: (1) Why is it that the anatomist does not discover these material objects in the interior of the brain? We ought to see them, for they are material, and therefore visible. We ought to see them with their aspect and colour, or be able to explain why they are not seen. In general, all that is described to us in the brain is the molecular vibrations. But we are not conscious of them. Where, then, is that of which we are conscious? (2) It should next be explained to us by what elaboration, transmutation, or metamorphosis a molecular disturbance, which is material, can transform itself into the objects which are equally material.

This is the criticism we have to address to materialism. Until proof to the contrary, I hold it to be irrefutable.

PARALLELISM

For this exposition to follow the logical order of ideas, the discussion on materialism should be immediately succeeded by that on parallelism. These two doctrines are near akin; they resemble each other as the second edition of a book, revised and corrected, resembles the first. Parallelism is the materialist doctrine of those forewarned folk, who have perceived the errors committed and endeavour to avoid them, while cherishing all that can be saved of the condemned doctrine. That which philosophers criticised in materialism was the misunderstanding of the principle of heterogeneity. The parallelists have seen this mistake, and have taken steps to respect this principle: we shall see in what way. They are especially prudent, and they excel in avoiding being compromised. They put forth their hypothesis as a provisional one, and they vaunt its convenience. It is, say they, a practical method of avoiding many difficulties; it becomes for philosophers an

equivalent of that phrase which so many timorous ministers repeat: "Above all, no scrapes!"

Let us study the exact point on which parallelism has amended materialism. We have seen that every materialist doctrine is the expression of this idea, that physical phenomena are the only ones that are determined, measurable, explicable, and scientific. This idea does wonders in the natural sciences, but is at fault when, from the physical, we pass into the moral world, and we have seen how the materialistic doctrine fails when it endeavours to attach the physical to the mental. There are then two great difficulties which the materialistic explanation finds before it; one is a difficulty of mechanism and the other of genesis. By connecting the mind with the brain, like a function to its organ, this doctrine seeks to solve these two problems, and with what little success we have seen.

Parallelism, has tried to avoid these two problems; not only does it not solve them, but it arranges so as not to propound them. The expedient adopted consists in avoiding the meeting of the physical and the mental; instead of placing them end to end and welding one to the other, they are placed in parallel fashion side by side. To explain their correlation, which so many observations vaguely demonstrate, the following hypothesis is advanced. Physical and psychical life form two parallel currents, which never mingle their waters; to every state of definite consciousness there corresponds the counterpart of an equally definite state of the nerve centres; the fact of consciousness has its antecedents and its consequences in the consciousness; and the physical fact equally takes its place in a chain of physical facts. The two series are thus evolved, and correspond strictly to each other according to a necessary law; so that the scholar who was perfectly instructed, and to whom one of these states was presented, could describe its fellow. But never does any of the terms of one series influence the terms of the other.

Observation and the testimony of the consciousness seem to attest this dual progress; but they are, according to the parallelist hypothesis, illusions. When I move my arm by a voluntary act, it is not my will, *qua* act of consciousness, which determines the movement of the arm—for this is a material fact. The movement is produced by the coming into play of groups of muscles. Each muscle, composed of a semi-fluid substance, being

excited, contracts in the direction of its greatest length. The excitant of the muscles is also a material fact, a material influx which starts from the motor cells of the encephalon, and of which we know the course down through the pyramidal fascium, the anterior roots of the spinal cord, and the nerves of the periphery to its termination in the motor plates of the muscles. It is this excitement which is the physical, direct, and veritable cause of voluntary movements. And it is the same with all acts and signs, all expressions of our conscious states; the trembling of fear, the redness of anger, the movements of walking, down to the words we utter—all these are physical effects produced by physical processes, which act physically, and of which the mental counterpart has in itself no effective action.

Let it be understood that I am here pointing out one of the forms, and that the most usual, of the parallelist theory. Each author varies it according to his fancy; some widen the correspondence between the physical and the moral, others prefer to narrow it. At one time a vague relation is supposed which is only true on a large scale, and is a union rather than an equivalence. At another, it is an exact counterpart, a complete duplicate in which the smallest physical event corresponds to a mental one.

In one of the forms of this theory that has been recently invented, parallelists have gone so far as to assert that there exists no real cohesion in the mental chain, and that no mental phenomenon can have the property of provoking another mental phenomenon by an act of true causality. It is within the nervous tissue, they say, that the nexus of psychic states should be enclosed. These should succeed in time without being directly connected with one another; they should succeed because the physical basis of them is excited in succession. Some of them would be like an air on the piano: the notes follow each other and arrange themselves into melodies, not by any affinity proper to themselves, but because the keys of the instrument are struck in the required order.

I said a little while ago that parallelism was a perfected materialism. The reason of this will be understood. It is a doctrine which preserves the determinism of physical facts while avoiding the compromising of itself in the difficult explanation of the connection between the soul and the body. It remains scientific without raising a metaphysical heresy.

Bain is one of those who have most clearly expressed, not only the advantages, but also the aspirations of this theory (*Mind and Body*, p. 130):

"We have every reason for believing," he says, "that there is in company with all our mental processes, *an unbroken material succession*. From the ingress of a sensation, to the outgoing responses in action, the mental succession is not for an instant dissevered from a physical succession. A new prospect bursts upon the view; there is mental result of sensation, emotion, thought—terminating in outward displays of speech or gesture. Parallel to this mental series is the physical series of facts, the successive agitation of the physical organs, called the eye, the retina, the optic nerve, optic centres, cerebral hemispheres, outgoing nerves, muscles, &c. While we go the round of the mental circle of sensation, emotion, and thought, there is an unbroken physical circle of effects. It would be incompatible with everything we know of the cerebral action, to suppose that the physical chain ends abruptly in a physical void, occupied by an immaterial substance; which immaterial substance, after working alone, imparts its results to the other edge of the physical break, and determines the active response—two shores of the material with an intervening ocean of the immaterial. There is, in fact, no rupture of nervous continuity. The only tenable supposition is, that mental and physical proceed together, as undivided twins."

On reading this passage it is easy to see the idea which forms the basis of the doctrine. It is, as I have already said, the fetichism of mechanics: parallelism takes its inspiration from this quite as directly as does materialism, but with more skill, inasmuch as it avoids the most dangerous question, that of the interaction of physics and morals, and replaces it by an hypothesis much resembling Leibnitz's hypothesis of the pre-established harmony. On the other hand, a second merit of this prudent doctrine is the avoiding the question of genesis. It does not seek for the origin of thought, but places this last in a relation of parallelism with the manifestations of matter; and in the same way that parallel lines prolonged *ad infinitum* never meet, so the partisans of this doctrine announce their resolution not to inquire how the actual state of things has been formed, nor how it will end if, for example, one of the terms should disappear by the death of the bodily organism.

Notwithstanding so many precautions, criticisms have not been wanting; only they would seem not to have touched the weak part of the doctrine and not to be decisive. We will only run through them briefly.

It has been said: there is no logical necessity which forces us to refuse to the consciousness the privilege of acting in complete independence of the nervous mechanism.

It has also been said: it is by no means certain that any nervous mechanism can be invented which imitates and, if need were, could replace an intellectual act. For instance, what association of nerve cells, what molecular action, can imitate an act of comparison which enables us to see a resemblance between two objects? Let it be supposed, for example, that the resemblance of two impressions come from a partial identity, and that the latter has for material support an identity in the seat or the form of the corresponding nervous influx. But what is identity? How can it be conceived without supposing resemblance, of which it is but a form? How, then, can the one be explained by the other? Thus, for instance, at the bottom of all our intellectual acts, there is a certain degree of belief. Can any material combination be found which corresponds thereto?

There is one last objection, the most serious of all. Parallelism, by establishing a fixed and invariable relation between the physical and the moral, ends by denying the rôle of this last, since the physical mechanism is sufficient to draw to itself all the effects which general belief attributes to the moral. The parallelists on this point go very much further than the materialists; the latter at least concede that the consciousness is of some use, since they compared it to a function or a secretion, and, after all, a secretion is a useful liquid. The parallelists are so strongly convinced that mechanism is alone efficacious that they come to deny any rôle to thought. The consciousness for them has no purpose: yet it keeps company with its object. The metaphors which serve to define it, part of which have been imagined by Huxley, are all of a passive nature. Such is the light, or the whistling noise which accompanies the working of an engine, but does not act on its machinery. Or, the shadow which dogs the steps of the traveller. Or a phosphorescence lighting up the traces of the movements of the brain.

It has also been said that the consciousness is a useless luxury. Some have even gone further, and the fine and significant name of *epiphenomenon*, that has been given to thought, well translates that conception, according to which semi-realities may exist in nature.

All these objections certainly carry great weight, but they are not capable of killing the doctrine—they only scotch it.

I think there is a radical vice in parallelism, which till now has not been sufficiently indicated, and I ask what can really remain of the whole edifice when this vice has been once exposed?

Parallelism implies a false idea, which we have already come across when discussing materialism. It is the idea that a phenomenon of consciousness constitutes one complete whole.

The error proceeds from the use of concepts which cause the reality to be lost sight of. The reality shows that every phenomenon of consciousness consists in a mode of activity, an aggregate of faculties which require an object to fasten on to and so realise themselves, and that this object is furnished by matter. What we always note in intuition is the union, the incarnation of consciousness-matter. Our thoughts, our memories, our reasonings have as object sensations, images—that is to say, things which, strictly speaking, are as material as our own brains. It is therefore rather childish to put all these workings of the spirit on another plane and in another world than the workings of the brain since they are in great part of the same nature as the last named and they contain so many material elements. Now if we re-establish facts as they are, if we admit a parallelism between physical phenomena, on the one hand, and phenomena at once physical and psychical, on the other, the parallelist hypothesis loses every sort of meaning. It ceases to present to us the image of two phenomena of an absolutely different order, which are found coupled together like the two faces of a unity, the front and back of a page, the right and wrong side of a stuff. If there is anything material in the psychical part, the opposition of nature no longer exists between the two terms; they become identical.

Very often, certain parallelists, after thinking they have discovered the duality of nature, endeavour to bring it back to unity by supposing that the

two faces of the reality are as two effects of one unique reality, inaccessible to our senses and underlying appearances. Why go so far afield to seek unity? It is trouble in vain: for it is to be found in the phenomenon itself.

FOOTNOTES:

[46] I can quote two observations in support of this. M. BRIEUX, to whom I was relating this part of my argument, stopped me, saying, "You have guessed right; I represent to myself thought issuing from brain in the form of an electric gleam." Dr. SIMON also informed me, during the reading of my manuscript, that he saw "thought floating over the brain like an *ignis fatuus*."

CHAPTER IV

MODERN THEORIES

It may be thought that the objection taken above to parallelism and materialism is personal to myself, because I have put it forward as the consequence of my analysis of the respective shares of thought and matter in every act of cognition. This is not so. I am here in harmony with other philosophers who arrived at the same conclusions long before me, and it may be useful to quote them.

We will begin with the prince of idealists, Berkeley. "Everything you know or conceive other than spirits,' says Philonous to Hylas, 'is but your ideas; so then when you say that all ideas are occasioned by impressions made in the brain, either you conceive this brain or you do not. If you conceive it, you are in that case talking of ideas imprinted in an idea which is the cause of this very idea, which is absurd. If you do not conceive it, you are talking unintelligibly, you are not forming a reasonable hypothesis.' 'How can it be reasonable,' he goes on to say, 'to think that the brain, which is a sensible thing, *i.e.* which can be apprehended by the senses—an idea consequently which only exists in the mind—is the cause of our other ideas?'"[47]

Thus, in the reasoning of Berkeley, the function of the brain cannot explain the production of ideas, because the brain itself is an idea, and an idea cannot be the cause of all our other ideas.

M. Bergson's argument is quite similar, although he takes a very different standpoint from that of idealism. He takes the word image in the vaguest conceivable sense. To explain the meaning of this word he simply says: "images which are perceived when I open my senses, and unperceived when I close them." He also remarks that the external objects are images, and that the brain and its molecular disturbances are likewise images. And he adds, "For this image which I call cerebral disturbance to generate the external images, it would have to contain them in one way or another, and the representation of the whole material universe would have to be

implicated in that of this molecular movement. Now, it is enough to enunciate such a proposition to reveal its absurdity."[\[48\]](#)

It will be seen that this reasoning is the same as Berkeley's, though the two authors are reasoning on objects that are different; according to Berkeley, the brain and the states of conscience are psychical states; according to Bergson, the definition of the nature of these two objects designated by the term image is more comprehensive, but the essential of his argument is independent of this definition. It is enough that the two terms should be of similar nature for one to be unable to generate the other.

My own argument in its turn comes rather near the preceding ones. For the idea of Berkeley, and the image of Bergson, I substitute the term matter. I say that the brain is matter, and that the perception of any object is perception of matter, and I think it is not easy to explain how from this brain can issue this perception, since that would be to admit that from one matter may come forth another matter. There is certainly here a great difficulty.

M. Bergson has thought to overcome it by attacking it in the following way. He has the very ingenious idea of changing the position of the representation in relation to the cerebral movement. The materialist places the representation after this movement and derives it from the movement; the parallelist places it by the side of the movement and in equivalence to it. M. Bergson places it before the movement, and supposes it to play with regard to it the part of exciting cause, or simply that of initiator. This cerebral movement becomes an effect of the representation and a motor effect. Consequently the nervous system passes into the state of motor organ: the sensory nerves are not, as supposed, true sensory nerves, but they are the commencements of motor nerves, the aim of which is to lead the motor excitements to the centres which play the part of commutators and direct the current, sometimes by one set of nerves, sometimes by others. The nervous system is like a tool held in the hand: it is a vehicle for action, we are told, and not a substratum for cognition. I cannot here say with what ingenuity, with what powerful logic, and with what close continuity of ideas M. Bergson develops his system, nor with what address he braves its difficulties.

His mind is remarkable alike for its power of systematisation and its suppleness of adaptation. Before commencing to criticise him, I am anxious to say how much I admire him, how much I agree with him throughout the critical part of his work, and how much I owe to the perusal of his book, *Matière et Mémoire*. Though I was led into metaphysics by private needs, though some of the ideas I have set forth above were conceptions of my own (for example, the criticism of the mechanical theory of matter, and the definition of sensation), before I had read M. Bergson's book, it cannot be denied that its perusal has so strongly modified my ideas that a great part of these are due to him without my feeling capable of exactly discerning which; for ideas have a much more impersonal character than observations and experiments. It would therefore have been ungrateful to criticise him before having rendered him this tribute.

There are, in M. Bergson's theory, a few assertions which surprise us a little, like everything which runs counter to old habits. It has always been supposed that our body is the receptacle of our psychological phenomena. We store our reminiscences in our nerve centres; we put the state of our emotions in the perturbations of certain apparatus; we find the physical basis of our efforts of will and of attention in the sensations of muscular tension born in our limbs or trunk. Directly we believe that the nervous system is no longer the depository of these states, we must change their domicile; and where are they to be placed? Here the theory becomes obscure and vague, and custom renders it difficult to understand the situation of the mind outside the body. M. Bergson places memory in planes of consciousness far removed from action, and perception he places in the very object we perceive.

If I look at my bookcase, my thought is in my books; if I look at the sky, my thought is in a star.^[49] It is very difficult to criticise ideas such as these, because one is never certain that one understands them. I will therefore not linger over them, notwithstanding the mistrust which they inspire in me.

But what seems to me to require proof is the function M. Bergson is led to attribute to the sensory nerves. To his mind, it is not exact to say that the excitement of a sensory nerve excites sensation. This would be a wrong description, for, according to him, every nerve, even a sensory one, serves as a motor; it conducts the disturbance which, passing through the central

commutator, flows finally into the muscles. But then, whence comes it that I think I feel a sensation when my sensory nerve is touched? Whence comes it that a pressure on the epitrochlear nerve gives me a tingling in the hand? Whence comes it that a blow on the eyeball gives me a fleeting impression of light? One must read the page where M. Bergson struggles against what seems to me the evidence of the facts. "If, for one reason or another," he says, "the excitement no longer passes, it would be strange if the corresponding perception took place, since this perception would then put our body in relation with points of space which would no longer invite it to make a choice. Divide the optic nerve of any animal; the disturbance starting from the luminous point is no longer transmitted to the brain, and thence to the motor nerves. The thread which connected the external object to the motor mechanism of the animal by enveloping the optic nerve, is severed; the visual perception has therefore become powerless, and in this powerlessness consists unconsciousness." This argument is more clever than convincing. It is not convincing, because it consists in exaggerating beyond all reason a very real fact, that of the relation which can be discovered between our sensations and our movements. We believe, with M. Bergson, that it is absolutely correct to see in action the end and the *raison d'être* of our intelligence and our sensibility. But does it follow that every degree, every shade, every detail of sensation, even the most insignificant, has any importance for the action? The variations of sensibility are much more numerous than those of movements and of adaptation; very probably, as is seen in an attentive study of infancy, sensibility precedes the power of motion in its differentiations. A child shows an extraordinary acuteness of perception at an age when its hand is still very clumsy. The correlation, then, is not absolute. And then even if it were so, it would not follow that the suppression of any movement would produce by rebound the suppression of the sensation to which this movement habitually corresponds. On this hypothesis, a sensation which loses its motor effect becomes useless. Be it so; but this does not prove that the uselessness of a sensation is synonymous with insensibility. I can very well imagine the movement being suppressed and the useless sensation continuing to evoke images and to be perceived. Does not this occur daily? There are patients who, after an attack of paralysis remain paralysed in one limb, which loses the voluntary movement, but does not necessarily lose its

sensibility. Many clear cases are observed in which this dissociation takes place.

I therefore own that I cannot follow M. Bergson in his deduction. As a physiologist, I am obliged to believe firmly in the existence of the sensory nerves, and therefore I continue to suppose that our conscious sensations are consequent to the excitement of these nerves and subordinate to their integrity. Now, as therein lies, unless I mistake, the essential postulate, the heart of M. Bergson's theory, by not admitting it I must regretfully reject the whole.

FOOTNOTES:

[47] I borrow this quotation from RENOUVIER, *Le Personnellisme*, p. 263.

[48] *Matière et Mémoire*, p. 3. The author has returned to this point more at length in a communication to the Congrès de Philosophie de Genève, in 1904. See *Revue de Métaphysique et de Morale*, Nov. 1904, communication from H. BERGSON entitled "Le Paralogisme psycho-physiologique." Here is a passage from this article which expresses the same idea: "To say that the image of the surrounding world issues from this image (from the cerebral movement), or that it expresses itself by this image, or that it arises as soon as this image is suggested, or that one gives it to one's self by giving one's self this image, would be to contradict one's self; since these two images, the outer world and the intracerebral movement, have been supposed to be of the same nature, and the second image is, by the hypothesis, an infinitesimal part of the field of representation, while the first fills the whole of it."

[49] *Matière et Mémoire*, p. 31

CHAPTER V

CONCLUSION

A few convinced materialists and parallelists, to whom I have read the above criticisms on their systems, have found no answer to them; my criticisms have appeared to them just, but nevertheless they have continued to abide by their own systems, probably because they were bound to have one. We do not destroy an erroneous idea when we do not replace it by another.

This has decided me to set forth some personal views which, provisionally, and for want of better, might be substituted for the old doctrines. Before doing this, I hasten to explain their character, and to state openly that they are only hypotheses.

I know that metaphysicians rarely make avowals of this kind. They present their systems as a well-connected whole, and they set forth its different parts, even the boldest of them, in the same dogmatic tone, and without warning that we ought to attach very unequal degrees of confidence to these various parts. This is a deplorable method, and to it is perhaps due the kind of disdain that observers and experimentalists feel for metaphysics—a disdain often without justification, for all is not false, and everything is not hypothetical, in metaphysics. There are in it demonstrations, analyses, and criticisms, especially the last, which appear to me as exact and as certain as an observation or experiment. The mistake lies in mixing up together in a statement, without distinction, the certain with the probable, and the probable with the possible.

Metaphysicians are not wholly responsible for this fault of method; and I am much inclined to think that it is the natural consequence of the abuse of speculation. It is especially by the cultivation of the sciences of observation that we foster in ourselves the precious sense of proof, because we can check it any minute by experimental verification. When we are working at a distance from the facts, this sense of proof gets thinner, and there is lost that

feeling of responsibility and fear of seeing one's assertions contradicted by a decisive countervailing observation, which is felt by every observer. One acquires the unbearable pride which I note in Kant, and one abandons one's self to the spirit of construction. I am speaking from personal experience. I have several times detected within me this bad spirit of construction, I have been seeking to group several facts of observation under the same idea, and then I have discovered that I was belittling and depreciating those facts which did not fit in with the idea.

The hypothesis I now present on the relations of the mind and the brain has, for me, the advantage of bringing to light the precise conditions which a solution of this great problem must satisfy for this solution to be worthy of discussion.

These conditions are very numerous. I shall not indicate them all successively; but here are two which are particularly important.

1. The manifestations of the consciousness are conditioned by the brain. Let us suspend, by any means, the activity of the encephalic mass, by arresting the circulation of the blood for example, and the psychic function is at once inhibited. Compress the carotid, and you obtain the clouding-over of the intellect. Or, instead of a total abolition, you can have one in detail; sever a sensory nerve with the bistoury, and all the sensations which that nerve transmits to the brain are suppressed. Consciousness appears only when the molecular disturbance reaches the nerve centres; everything takes place in the same way as if this disturbance released the consciousness. Consciousness also accompanies or follows certain material states of the nerve centres, such as the waves which traverse the sensory nerves, which exercise reflex action in the cells, and which propagate themselves in the motor nerves. It is to the production, the distribution, and the integrity of this nervous influx that the consciousness is closely linked. It there finds one of the conditions of its apparition.

2. On the other hand, the consciousness remains in complete ignorance of these intra-cerebral phenomena. It does not perceive the nerve-wave which sets it in motion, it knows nothing of its peculiarities, of its trajectory, or the length of its course. In this sense it may be said that it is in no degree an anatomist; it has no idea of all the peculiarities of the nerve-wave which

form part of its cerebral history from the moment when these peculiarities are out of relation with the properties of external objects.

One sometimes wonders that our consciousness is not aware that the objects we perceive with our two eyes correspond to a double undulation, namely, that of the right and that of the left, and that the image is reversed on the retina, so that it is the rods of the right which are impressed by objects on our left, and the rods of the upper part by objects below our eyes. These are, it has been very justly said, factitious problems, imaginary difficulties which do not exist. There is no need to explain, for instance, direct vision by a reversed image, because our consciousness is not aware that the image on the retina is reversed. In order to take account of this, we should require another eye to see this image. This answer appears particularly to the point. It will be found that it is absolutely correct if we reflect that this case of the unfelt inversion of the image on the retina is but one example of the anatomical ignorance of the consciousness.

It might also be declared, in the same order of ideas, that our consciousness is ignorant, that excitements of the eye cross each other at the level of the chiasma, and pass through the internal capsule, and that the majority of the visual excitements of an eye are received by the opposite hemisphere.

A rather confused notion of these facts has formed itself in the minds of several critics, and I can discern the proof of this in the language they use. It will be said, for example, that the idea exists in the consciousness or in the mind, and phrases like the following will be avoided: "I think with my brain"—the suggestion consists in introducing an idea in the brain—"The nerve cell perceives and reasons, &c." Ordinarily these forms of speech are criticised because they appear to have the defect of establishing a confusion between two irreducible elements, the physical and the mental. I think the error of language proceeds from another cause, since I do not admit this distinction between the physical and the mental. I think that the error consists in supposing vaguely that the consciousness comprehends intra-cerebral phenomena, whereas it ignores them.

Let me repeat that there is no such thing as intra-cerebral sensibility. The consciousness is absolutely insensitive with regard to the dispositions of the cerebral substance and its mode of work. It is not the nervous undulation

which our consciousness perceives, but the exciting cause of this wave—that is, the external object. The consciousness does not feel that which is quite close to it, but is informed of that which passes much further off. Nothing that is produced inside the cranium interests it; it is solely occupied with objects of which the situation is extra-cranial. It does not penetrate into the brain, we might say, but spreads itself like a sheet over the periphery of the body, and thence springs into the midst of the external objects.

There is, therefore, I do not say a contradiction, but a very striking contrast between these two facts. The consciousness is conditioned, kept up, and nourished by the working of the cerebral substance, but knows nothing of what passes in the interior of that substance. This consciousness might itself be compared to a parasitical organism which plunges its tap roots into the nerve centres, and of which the organs of perception, borne on long stalks, emerge from the cranium and perceive everything outside that cranium. But this is, of course, only a rough image.

Strictly, it is possible to explain this distribution of the conscience, singular as it is at first sight, by those reasons of practical utility which are so powerful in the history of evolution.

A living being has to know the world external to himself in order to adapt and preadapt himself to it, for it is in this outer world that he finds food, shelter, beings of his own species, and the means of work, and it is on this world of objects that he acts in every possible way by the contractions of his muscles. But with regard to intracephalic actions, they are outside the ordinary sphere of our actions. There is no daily need to know them, and we can understand that the consciousness has not found very pressing utilitarian motives for development in that direction. One must be an histologist or a surgeon to find an appreciable interest in studying the structure of the nerve cell or the topography of the cerebral centres.

We can therefore explain well enough, by the general laws of adaptation, the reason of the absence of what might be called "cerebral sensibility," but, here as elsewhere, the question of the "Why" is much easier to solve than that of the "How."

The question of the "How" consists in explaining that the consciousness, directly aroused by a nerve-wave, does not perceive this undulation, but in

its stead the external object. Let us first note that between the external object and the nervous influx there is the relation of cause to effect. It is only the effect which reaches us, our nerve cells, and our consciousness. What must be explained is how a cognition (if such a word may be employed here) of the effect can excite the consciousness of the cause. It is clear that the effect does not resemble the cause, as quality: the orange I am looking at has no resemblance with the brain wave which at this moment is traversing my optic nerve; but this effect contains everything which was in the cause, or, more exactly, all that part of the cause of which we have perception. Since it is only by the intermediary of our nervous system that we perceive the object, all the properties capable of being perceived are communicated to our nervous system and inscribed in the nerve wave. The effect produced therefore is the measure of our perception of the cause. This is absolutely certain. All bodies possess an infinity of properties which escape our cognitions; because, as excitants of our organism, these properties are wanting in the intensity or the quality necessary to make it vibrate; they have not been tuned in unison with our nervous chords. And, inversely, all we perceive of the mechanical, physical, and chemical properties of a body is contained in the vibration this body succeeds in propagating through our cerebral atmosphere. There is in this a phenomenon of transmission analogous to that which is produced when an air of music is sent along a wire; the whole concert heard at the other extremity of the wire has travelled in the form of delicate vibrations.

There must therefore exist, though unperceived by our senses, a sort of kinship between the qualities of the external objects and the vibrations of our nerves. This is sometimes forgotten. The theory of the specific energy of the nerves causes it to be overlooked. As we see that the quality of the sensation depends on the nerve that is excited, one is inclined to minimise the importance of the excitant. It is relegated to the position of a proximate cause with regard to the vibration of the nerve, as the striking of a key on the piano is the proximate cause of the vibration of a string, which always gives the same degree of sound whether struck by the forefinger or third finger, or by a pencil or any other body. It will be seen at once that this comparison is inexact. The specific property of our nerves does not prevent our knowing the form of the excitant, and our nerves are only comparable

to piano strings if we grant to these the property of vibrating differently according to the nature of the bodies which strike them.

How is it that the nerve wave, if it be the depository of the whole of the physical properties perceived in the object, resembles it so little? It is because—this is my hypothesis—these properties, if they are in the undulation, are not there alone. The undulation is the work of two collaborators: it expresses both the nature of the object which provokes it and that of the nervous apparatus which is its vehicle. It is like the furrow traced in the wax of the phonograph which expresses the collaboration of an aërial vibration with a stylus, a cylinder, and a clock-work movement. This engraved line resembles, in short, neither the phonographic apparatus nor the aërial vibration, although it results from the combination of the two.

Similarly, I suppose that if the nervous vibration resembles so little the excitant which gives it birth, it is because the factor nervous system adds its effect to the factor external object. Each of these factors represents a different property: the external object represents a cognition and the nervous system an excitement.

Let us imagine that we succeed in separating these two effects. It will be conceived, theoretically, that a separation of this kind will lay bare the hidden resemblances, giving to each collaborator the part which belongs to it. The excitement, for instance, will be suppressed, and the cognition will be retained. Is it possible to make, or at least to imagine, such an analysis? Perhaps: for, of these two competing activities, one is variable, since it depends on the constantly changing nature of the objects which come into relation with us; the other, on the contrary, is a constant, since it expresses the contribution of our nerve substance, and, though this last is of very unstable composition, it necessarily varies much less than the series of excitants. We consequently see faintly that these two elements differ sufficiently in character for us to be able to suppose that they are separable by analysis.

But how could this analysis be made? Evidently not by chemical or physical means: we have no need here of reagents, prisms, centrifugal apparatus, permeable membranes, or anything of that kind. It will suffice to suppose that it is the consciousness itself that is the dialyser. It acts by

virtue of its own laws—that is to say, by changes in intensity. Supposing that sensibility increases for the variable elements of the undulation, and becomes insensible for the constant elements. The effect will be the same as a material dissociation by chemical analysis: there will be an elimination of certain elements and the retention of others.

Now, all we know of the consciousness authorises us to entrust this rôle to it, for it is within the range of its habits. We know that change is the law of consciousness, that it is effaced when the excitements are uniform, and is renewed by their differences or their novelty. A continued or too often repeated excitement ceases in time to be perceived. It is to condense these facts into a formula that Bain speaks of the law of relativity of cognition, and, in spite of a few ambiguities on the part of Spencer and of Bain himself in the definition of this law,^[50] the formula with the sense I have just indicated is worth preserving.

Let us see what becomes of it, when my hypothesis is adopted. It explains how certain excitements proceeding from the objects—that is to say, forming part of the variable element—cease to be perceived when they are repeated and tend to become constant. *A fortiori*, it seems to me, should the same law explain how the constant element *par excellence*, the one which never varies from the first hour, is never perceived. There is, in the concert of the sounds of nature, an accompaniment so monotonous that it is no longer perceived; and the melody alone continues to be heard.

It is in this precisely that my hypothesis consists. We will suppose a nerve current starting from one of the organs of the senses, when it is excited by some object or other, and arriving at the centre of the brain. This current contains all the properties of the object, its colour, its form, its size, its thousand details of structure, its weight, its sonorous qualities, &c., &c., properties combined with and connected by the properties of the nerve-organ in which the current is propagated. The consciousness remains insensible to those nervous properties of the current which are so often repeated that they are annulled; it perceives, on the contrary, its variable and accidental properties which express the nature of the excitant. By this partial sensibility, the consciousness lays bare that which, in the nerve current, represents the object—that is to say, a cognition; and this operation is equivalent to a transformation of the current into a perception, image, or

idea. There is not, strictly speaking, a transformation, but an analysis; only, the practical result is the same as that of a transformation, and is obtained without its being necessary to suppose the transmutation of a physical into a mental phenomenon.

Let us place ourselves now at the moment when the analysis I am supposing to be possible has just been effected. Our consciousness then assists at the unrolling of representations which correspond to the outer world. These representations are not, or do not appear to be, lodged in the brain; and it is not necessary to suppose a special operation which, taking them in the brain, should project them to the periphery of our nerves. This transport would be useless, since for the consciousness the brain does not exist: the brain, with its fibres and cells, is not felt; it therefore supplies no *datum* to enable us to judge whether the representation is external or internal with regard to it. In other words, the representation is only localised in relation to itself; there is no determinate position other than that of one representation in relation to another. We may therefore reject as inexact the pretended law of eccentricity of the physiologists, who suppose that sensation is first perceived as it were centrally, and then, by an added act, is localised at the peripheric extremity of the nerve. This argument would only be correct if we admitted that the brain is perceived by the consciousness of the brain. I have already said that the consciousness is not an anatomist, and that therefore this problem does not present itself.

Such as it is, this hypothesis appears to me to present the advantage of explaining the reason why our consciousness coincides, in certain circumstances, with the actions of the brain, and, in others, does not come near them. In other words, it contains an explanation of the unconscious. I can show this by quoting certain exact facts, of which the explanation has been hitherto thought to present difficulties, but which become very easy to understand on the present hypothesis. The first of these facts relates to the psychology of the motor current. This current has been a great feature in the studies which have been made on the feeling of effort and on the physical basis of the will. The motor current is that which, starting from the cerebral cells of the motor region, travels by way of the fibres of the pyramidal tract into the muscles of the body; and it is centrifugal in direction. Researches have been made as to whether we are or may be conscious of this current; or rather, the question has been put in somewhat different terms. It has been

asked whether a psychological state can be the counterpart of this motor current,—if, for example, the feeling of mental effort produced in us at the moment of executing a difficult act or of taking a grave resolution, might not have this motor current for a basis.

The opinion which has prevailed is in the negative. We have recognised—a good deal on the faith of experiment, and a little also for theoretical reasons—that no sensation is awakened by the centrifugal current. As to the sensation of effort, it has been agreed to place it elsewhere. We put it among the centripetal sensations which, are produced as the movement outlines itself, and which proceed from the contracted muscles, the stretched ligaments, and the frictional movements of the articulations. Effort would therefore form part of all the psychical phenomenology, which is the duplicate of those sensory currents which are centripetal in direction.

In the long run, I can see no sort of theoretical reason for subordinating the consciousness to the direction of the nerve current, and for supposing that the consciousness is aroused when this current is centripetal, and that it cannot follow the centrifugal current. But this point matters little. My hypothesis would fairly well explain why the motor current remains unconscious; it explains the affair by taking into consideration the nature of this current and not its direction. This current is a motor one because it is born in the central cells, because it is a discharge from these cells, and is of entirely nervous origin. Since it does not correspond with the perception of an object—the ever varying object—it is always the same by nature. It does not carry with it in its monotonous course the *débris* of an object, as does the sensory current. Thus it can flow without consciousness.

This same kind of hypothesis supplies us with the reasons why a given sensory current may be, according to circumstances, either conscious or unconscious. The consciousness resulting from the analysis of the molecular wave is, as it were, a supplementary work which may be subsequently added to the realised wave. The propagation of the wave is the essential fact—there is always time to become conscious of it afterwards. It is thus that we happen, in moments of abstraction, to remain insensible to certain even very powerful excitements. Our nervous system registers them, nevertheless, and we can find them again, later on, within the memory. This is the effect of a belated analysis.

The converse phenomenon occurs much more frequently. We remark many actions and perceptions which occur the first time with consciousness, emotion, and effort. Then, when they are repeated, as coordination becomes stronger and easier, the reflex consciousness of the operation becomes feebler. This is the law of habit, which slowly carries us towards automatism. These observations have even been extended, and the endeavour made to apply them to the explanation of the origin of reflex actions and of instincts which have all started with consciousness. This is a rather bold attempt, for it meets with many serious difficulties in execution; but the idea seems fairly correct, and is acceptable if we may limit it. It is certain that the consciousness accompanies the effort towards the untried, and perishes as soon as it is realised. Whence comes this singular dilemma propounded to it by nature: to create something new or perish? It really seems that my hypothesis explains this. Every new act is produced by nerve currents, which contain many of those variable elements which the consciousness perceives; but, in proportion as the action of the brain repeats itself and becomes more precise and more exact, this variable element becomes attenuated, falls to its lowest pitch, and may even disappear in the fixation of habit and instinct.

My hypothesis much resembles the system of parallelism. It perfects it, as it seems to me, as much as the latter has perfected materialism. We indeed admit a kind of parallelism between the consciousness and the object of cognition; but these two series are not independent, not simply placed in juxtaposition as is possible in ordinary parallelism; they are united and fused together so as to complete each other. This new theory appears to me to represent a better form of the series of attempts which have been inspired by the common necessity of making the phenomena of consciousness accord with the determinism of physical facts.

I hold fast to this physical determinism, and accept a strictly mechanical conception of the functions of the nervous system. In my idea, the currents which pass through the cerebral mass follow each other without interruption, from the sensorial periphery to the motor periphery; it is they, and they alone, which excite the movements of the body by acting on the muscles. Parallelism recognises all these things, and I do likewise.

Let us now see the advantages of this new system. First, it contains no paralogism, no logical or psychological error, since it does not advance the supposition that the mental differs by its nature from the physical phenomenon. We have discussed above the consequences of this error, they are here avoided. In the second place, it is explanatory, at least in a certain measure, since the formula we employ allows us to understand, better than by the principle of a simple juxtaposition, why certain nerve currents flow in the light of consciousness, while others are plunged into the darkness of unconsciousness. This law of consciousness, which Bain called the law of relativity, becomes, when embodied with my theory of the relations of the physical to the moral, an explanation of the distribution of consciousness through the actions of the brain.

I ask myself whether the explanation I have devised ought to be literally preserved. Perhaps not. I have endeavoured less to present a ready-made solution than to indicate the direction in which we ought to look for one. The law of consciousness which I have used to explain the transformation of a nerve current into perception and images is only an empirical law produced by the generalisation of particular observations. Until now there has been, so far as I know, no attempt to ascertain whether this law of consciousness, notwithstanding the general nature which some authors incline to ascribe to it, might not explain itself by some more general facts, and might not fit, as a particular case, into a more comprehensive frame. To be brief, this is very possible. I have not troubled myself about it, and I have made a transcendental use of this empirical law; for I have impliedly supposed it to be a first principle, capable of accounting for the development of the consciousness, but itself incapable of explanation.

If other observers discover that that which to me has appeared inexplicable, may be explained by quite peculiar causes, it is clear that my theory must be abandoned or modified. New theories must then be sought for, which will probably consist in recognising different properties in the consciousness. A little thought will discover several, I have no doubt. By way of suggestion, I will indicate one of these hypothetical possibilities: "The consciousness has the faculty of reading in the effect that which existed in the cause." It is not rash to believe that by working out this idea, a certain solution would be discovered. Moreover, the essential is, I repeat, less to find a solution than to take account of the point which requires one; and metaphysics seem to

me especially useful when it shows us where the gap in our knowledge exists and what are the conditions required to fill this gap.

Above all, I adhere to this idea, which has been one of the guiding forces of this book: there exists at the bottom of all the phenomena of the intelligence, a duality. To form a true phenomenon, there must be at once a consciousness and an object. According to passing tendencies, either of temperament or of fashion, preponderance has been given sometimes to one of the terms of this couple, sometimes to the other. The idealist declares: "Thought creates the world." The materialist answers: "The matter of the brain creates thought." Between these two extreme opinions, the one as unjustifiable as the other in the excesses they commit, we take up an intermediate position. Looking at the balance, we see no argument capable of being placed in the scale of the consciousness which may not be neutralised by an argument placed in the scale of the object; and if we had to give our final verdict we should say: "The consciousness and matter have equal rights," thus leaving to every one the power to place, in this conception of an equality of rights, the hopes of survival of which his heart has need.

FOOTNOTES:

[50] The *équivoque* perpetrated by BAIN and SPENCER consists in supposing that the consciousness bears solely on differences. This is going too far. I confine myself to admitting that, if sensation is not changed from time to time, the consciousness becomes weaker and disappears.

CHAPTER VI

RECAPITULATION

I ask permission to reproduce here a communication made by me in December 1904 to the Société Française de Philosophie. I there set forth briefly the ideas which I have just developed in this book. This succinct *exposé* may be useful as a recapitulation of the argument.

Description of Matter.—The physicists who are seeking for a conception of the Inmost structure of matter in order to explain the very numerous phenomena they perceive, fancy they can connect them with other phenomena, less numerous, but of the same order. They thus consider matter in itself.

We psychologists add to matter something more, viz. the observer. We consider matter and define it by its relations to our modes of knowledge—that is to say, by bearing in mind that it is conditioned by our external perception. These are two different points of view.

In developing our own standpoint, we note that of the outer world we are acquainted with nothing but our sensations: if we propound this limit, it is because many observations and experiments show that, between the external object and ourselves, there is but one intermediary, the nervous system, and that we only perceive the modifications which the external object, acting as an excitant, provokes in this system.

Let us provisionally apply to these modifications the term sensations, without settling the question of their physical or mental nature.

Other experiments, again, prove to us that our sensations are not necessarily similar to the objects which excite them; for the quality of each sensation depends on what is called the specific energy of the nerve excited. Thus, whether the optic nerve be appealed to by a ray of light, an electric current, or a mechanical shock, it always gives the same answer, and this answer is the sensation of light.

It follows that our nervous system itself is only known to us as regards its structure by the intermediary of sensations, and we are not otherwise more informed upon its nature than upon that of any other object whatever.

In the second place, a much more serious consequence is that all our sensations being equally false, so far as they are copies of the excitants which provoke them, one has no right to use any of these sensations to represent to ourselves the inmost structure of matter. The theories to which many physicists still cling, which consist in explaining all the modalities of matter by different combinations of movement, start from false premises. Their error consists in explaining the whole body of our sensations by certain particular sensations of the eye, of the touch, and of the muscular sense, in which analysis discovers the elements and the source of the representation of motion. Now these particular sensations have no more objective value than those of the tongue, of the nose, and of the ear; in so far as they are related to the external excitant of which it is sought to penetrate the inmost nature, one of them is as radically false as the other.

It is true that a certain number of persons will think to escape from our conclusion, because they do not accept our starting point. There exist, in fact, several systems which propound that the outer world is known to us directly without the intermediary of a *tertium quid*, that is, of sensation. In the first place, the spiritists are convinced that disembodied souls can remain spectators of terrestrial life, and, consequently, can perceive it without the interposition of organs. On the other hand, some German authors have recently maintained, by rather curious reasoning, that the specific energy of our nervous system does not transform the excitants, and that our sensations are the faithful copies of that which causes them. Finally, various philosophers, Reid, Hamilton, and, in our own days, the deep and subtle mind of M. Bergson, have proposed to admit that by direct comprehension we have cognisance of the objects without mystery and as they are. Let this be admitted. It will change nothing in our conclusions, and for the following reasons.

We have said that no kind of our sensations—neither the visual, the tactile, nor the muscular—permits us to represent to ourselves the inmost structure of matter, because all sensations, without exception, are false, as copies of material objects. We are now assured that we are mistaken, and that our

sensations are all true—that is to say, are faithful copies of the objects. If all are true, it comes to the same thing as if all are false. If all are true, it is impossible to make any choice among them, to retain only the sensations of sight and touch, and to use them in the construction of a mechanical theory, to the exclusion of the others. For it is impossible for us to explain some by the others. If all are equally true, they all have the same right to represent the structure of matter, and, as they are irreconcilable, no theory can be formed from their synthesis.

Let us, consequently, conclude this: whatever hypothesis may be built up on the relations possibly existing between matter and our sensations, we are forbidden to make a theory of matter in the terms of our sensations.

That is what I think of matter, understood as the inmost structure of bodies—of unknowable and metaphysical matter. I shall not speak of it again; and henceforth when I use the word matter, it will be in quite a different acceptation—it will be empirical and physical matter, such as it appears to us in our sensations. It must therefore be understood that from this moment we change our ground. We leave the world of *noumena* and enter that of phenomena.

Definition of Mind.—Generally, to define the mind, we oppose the concept of mind to the concept of matter, with the result that we get extremely vague images in our thoughts. It is preferable to replace the concepts by facts, and to proceed to an inventory of all mental phenomena.

Now, in the course of this inventory, we perceive that we have continually to do with two orders of elements, which are united in reality, but which our thought may consider as isolated. One of these elements is represented by those states which we designate by the name of sensations, images, emotions, &c.; the other element is the consciousness of these sensations, the cognition of these images, the fact of experiencing these emotions. It is, in other words, a special activity of which these states are the object and, as it were, the point of application—an activity which consists in perceiving, judging, comparing, understanding, and willing. To make our inventory orderly, let us deal with these two elements separately and begin with the first.

We will first examine sensation: let us put aside that which is the fact of feeling, and retain that which is felt. Thus defined and slightly condensed, what is sensation? Until now we have employed the word in the very vague sense of a *tertium quid* interposed between the object and ourselves. Now we have to be more precise, and to inquire whether sensation is a physical or a mental thing. I need not tell you that on this point every possible opinion has been held. My own opinion is that sensation should be considered as a physical phenomenon; sensation, be it understood, in the sense of impression felt, and not in that of capacity to feel.

Here are the arguments I invoke for the support of my thesis: in the first place, popular opinion, which identifies matter with what we see, and with what we touch—that is to say, with sensation. This popular opinion represents a primitive attitude, a family possession which we have the right to retain, so long as it is not proved to us to be false: next, this remark, that by its mode of apparition at once unexpected, the revealer of new cognitions, and independent of our will, as well as by its content, sensation sums up for us all we understand by matter, physical state, outer world. Colour, form, extent, position in space, are known to us as sensations only. Sensation is not a means of knowing these properties of matter, it is these properties themselves.

What objections can be raised against my conclusion? One has evidently the right to apply the term psychological to the whole sensation, taken *en bloc*, and comprising in itself both impression and consciousness. The result of this terminology will be that, as we know nothing except sensations, the physical will remain unknowable, and the distinction between the physical and the mental will vanish. But it will eventually be re-established under other names by utilising the distinction I have made between objects of cognition and acts of cognition;—a distinction which is not verbal, and results from observation.

What is not permissible is to declare that sensation is a psychological phenomenon, and to oppose this phenomenon to physical reality, as if this latter could be known to us by any other method than sensation.

If the opinion I uphold be accepted, if we agree to see in sensation, understood in a certain way, a physical state, it will be easy to extend this

interpretation to a whole series of different phenomena. To the images, first, which proceed from sensations, since they are recurring sensations; to the emotions also, which, according to recent theories, result from the perception of the movements which are produced in the heart, the vessels, and the muscles; and finally, to effort, whether of will or of attention, which is constituted by the muscular sensations perceived, and consequently also results from corporeal states. The consequences must be clearly remarked. To admit that sensation is a physical state, is to admit, by that very fact, that the image, idea, emotion, and effort—all those manifestations generally ascribed to the mind alone—are also physical states.

What, then, is the mind? And what share remains to it in all these phenomena, from which it seems we are endeavouring to oust it? The mind is in that special activity which is engaged in sensation, image, idea, emotion, and effort. For a sensation to be produced; there must be, as I said a little time ago, two elements: the something felt—a tree, a house, an animal, a titillation, an odour,—and also the fact of feeling this something, the consciousness of it, the judgment passed on it, the reasoning applied to it—in other terms, the categories which comprehend it. From this point of view, the dualism contained in sensation is clearly expressed. Sensation as a thing felt, that is, the physical part, or matter; sensation as the fact of feeling or of judging, that is, the mind.

Mark the language I use. We say that matter is the something felt; but we do not say for the sake of symmetry, that the mind is the something which feels. I have used a more cautious, and, I think, a more just formula, which places the mind in the fact of feeling. Let me repeat again, at the risk of appearing too subtle: the mind is the act of consciousness; it is not a subject which has consciousness. For a subject, let it be noted, a subject which feels, is an object of cognition—it forms part of the other group of elements, the group of sensations. In practice we represent by mind a fragment of our own biography, and by dint of pains we attribute to this fragment the faculty of having a consciousness; we make it the subject of the relation subject-object. But this fragment, being constituted of memories and sensations, does not exactly represent the mind, and does not correspond to our definition; it would rather represent the mind sensationalised or materialised.

From this follows the curious consequence that the mind is endowed with an incomplete existence; it is like form, which can only be realised by its application to matter of some kind. One may fancy a sensation continuing to exist, to live and to provoke movements, even after ceasing to be perceived. Those who are not uncompromising idealists readily admit this independence of the objects with regard to our consciousness, but the converse is not true. It is impossible to understand a consciousness existing without an object, a perception without a sensation to be perceived, an attention without a point of application, an empty wish which should have nothing to wish for; in a word, a spiritual activity acting without matter on which to act, or more briefly still—mind without matter. Mind and matter are correlative terms; and, on this point, I firmly believe that Aristotle was much closer to the truth than many modern thinkers.

I have convinced myself that the definition of mind at which we have just arrived is, in its exactness and soberness, the only one which permits psychology to be distinguished from the sciences nearest to it. You know that it has been discovered in our days that there exists a great difficulty in effecting this delimitation. The definitions of psychology hitherto proposed nearly all have the defect of not agreeing with the one thing defined. Time fails us to review them all, but I shall point out one at least, because our discussion on this particular formula will serve as a preparation for taking in hand the last question that remains to be examined—the relation of the mind to the body.

According to the definition I am aiming at, psychology would be the science of internal facts, while the other sciences deal with the external. Psychology, it has also been said, has as its instrument introspection, while the natural sciences work with the eye, the touch, the ear—that is to say, with the senses of extrospection.

To this distinction, I reply that in all sciences there exist but two things: sensations and the consciousness which accompanies them. A sensation may belong to the inner or the outer world through accidental reasons, without any change in its nature; the sensation of the outer world is the social sensation which we share with our fellows. If the excitant which provokes it is included in our nervous system, it is the sensation which becomes individual, hidden to all except ourselves, and constituting a

microcosm by the side of a macrocosm. What importance can this have, since all the difference depends on the position occupied by the excitant?

But we are persistently told: there are in reality two ways of arriving at the cognition of objects—from within and from without. These two ways are as opposite as the right and wrong side of a stuff. It is in this sense that psychology is the science of the within and looks at the wrong side, while the natural sciences reckon, weigh, and measure the right side. And this is so true, they add, that the same phenomenon absolutely appears under two forms radically different from each other according as they are looked at from one or the other of the two points of view. Every one of our thoughts, they point out to us, is in correlation with a particular state of our cerebral matter; our thought is the subjective and mental face, the corresponding cerebral process is the objective and material face.

Though this dualism is frequently presented as an observed truth, I think it is possible to show its error. Take an example: I look at the plain before me, and see a flock of sheep pass through it. At the same time an observer, armed with a microscope *à la* Jules Verne, looks into my brain and observes there a certain molecular dance which accompanies my visual perception. Thus, on the one hand, is my representation; on the other, a dynamic state of the nerve cells. This is what constitutes the right and the wrong sides of the stuff. We are told, "See how little resemblance there is in this; a representation is a psychical, and a movement of molecules a material, thing."

But I, on the contrary, think there is a great resemblance. When I see the flock passing, I have a visual perception. The observer who, by the hypothesis, is at that moment looking into my brain, also experiences a visual perception. Granted, they are not the same perception. How could they be the same? I am looking at the sheep, he is looking at the interior of my brain; it is not astonishing that, looking at objects so different, we should receive images also very different. But, notwithstanding their difference of object—that is, of content—there are here two visual perceptions composed in the same way; and I do not see by what right it can be said that one represents a material, the other a physical, phenomenon. In reality, each of these perceptions has a two-fold and psycho-physical value—physical in regard to the object to which it applies, and psychical

inasmuch as it is an act of perception, that is to say, of consciousness. For one is just as much psychical as the other, and as much material, for a flock of sheep is as material a thing as is my brain. If we keep this conclusion in our minds, when we come to make a critical examination of certain philosophical systems, we shall easily see the mistake they make.

Spiritualism^[51] rests on the conception that the mind can subsist and work in total independence of any tie to matter. It is true that, in details, spiritualists make some modification in this absolute principle in order to explain the perceptions of the senses and the execution of the orders of the will; but the duality, the independence, and the autonomy of the soul and the body remain, in any case, the peculiar dogma of the system. This dogma appears to me utterly false; the mind cannot exist without matter to which it is applied; and to the principle of heterogeneity, so often invoked to forbid all commerce between the two substances, I reply by appealing to intuition, which shows us the consciousness and its different forms, comparison, judgment, and reasoning, so closely connected with sensation that they cannot be imagined as existing with an isolated life.

Materialism, we know, argues quite differently; it imagines that a particular state of the nerve centres has the virtue of generating a psychical phenomenon, which represents, according to various metaphors, property, function, effect, and even secretion. Critics have often asked how, with matter in motion, a phenomenon of thought could be explained or fabricated. It is very probable that those who admit this material genesis of thought, represent it to themselves under the form of something subtle, like an electric spark, a puff of wind, a will-of-the-wisp, or an alcoholic flame. Materialists are not alone responsible for these inadequate metaphors, which proceed from a metaphysics constructed of concepts. Let us recollect exactly what a psychical phenomenon is. Let us banish the will-o'-the-wisps, replace them by a precise instance, and return to the visual perception we took as an example a little while back: without intending a pun, "revenons à nos moutons." These sheep which I see in the plain are as material, as real, as the cerebral movement which accompanies my perception. How, then, is it possible that this cerebral movement, a primary material fact, should engender this secondary material fact, this collection of complicated beings which form a flock?

Before going any further, let us invite another philosophical system to take a place within the circle of our discussion; for the same answer will suffice for it as well as for the preceding one, and it will be as well to deal with both at once. This new system, parallelism, in great favour at the present day, appears to me to be a materialism perfected especially in the direction of caution. To escape the mystery of the genesis of the mind from matter, this new system places them parallel to each other and side by side, we might almost say experimentally, so much do parallelists try to avoid talking metaphysics. But their position is untenable, and they likewise are the victims of the mirage of concepts; for they consider the mental as capable of being parallel to the physical without mingling with it, and of subsisting by itself and with a life of its own. Such a hypothesis is only possible by reason of the insufficient definition given to the mind. If it be recognised that the mind has an incomplete existence and is only realised by its incarnation in matter, the figure which is the basis of parallelism becomes indefensible. There is no longer on the one hand the physical, and on the other the mental, but on one side the physical and the mental combined, and on the other the same combination; which amounts to saying that the two faces to a reality, which it was thought had been made out to be so distinct, are identical. There are not two faces, but one face; and the monism, which certain metaphysicians struggle to arrive at by a mysterious reconciliation of the phenomenal duality within the unity of the noumenon, need not be sought so far afield, since we already discover it in the phenomenon itself.

The criticisms I have just pointed out to you, only too briefly, are to be found in several philosophers, confusedly in Berkeley, and with more precision in M. Bergson's book on *Matière et Mémoire*. The latter author, remarking that our brain and the outer world are to us images of the same order, refuses to admit that the brain, which is only a very small part of these images, can explain and contain the other and much larger part, which comprises the vast universe. This would amount to saying that the whole is comprised in the part. I believe that this objection is analogous to the one just stated with less ingenuity.

It is interesting to see how M. Bergson gets out of the difficulty which he himself raised. Being unwilling to bring forth from the molecular movement of the brain the representation of the world, or to superpose the

representation on this movement as in the parallelist hypothesis, he has arrived at a theory, very ingenious but rather obscure, which consists in placing the image of the world outside the brain, this latter being reduced to a motor organ which executes the orders of the mind.

We thus have four philosophical theories, which, while trying to reconcile mind with matter, give to the representation a different position in regard to cerebral action. The spiritualist asserts the complete independence of the representation in relation to cerebral movement; the materialist places it after, the parallelist by the side of, the cerebral movement; M. Bergson puts it in front.

I must confess that the last of these systems, that of M. Bergson, presents many difficulties. As he does not localise the mind in the body, he is obliged to place our perception—that is to say, a part of ourselves—in the objects perceived; for example, in the stars when we are looking at them. The memory is lodged in distant planes of consciousness which are not otherwise defined. We understand with difficulty these emigrations, these crumbings into morsels of our mind. This would not matter if our author did not go so far as to maintain that the sensory nerves of the brain are not sensory nerves, and that the severance of them does not suppress sensations, but simply the motor efforts of these sensations. All the physiologist in me protests against the rashness of these interpretations.

The principal difficulties of the problem of the union between the mind and the body proceed from the two following facts, which seem incompatible. On the one hand, our thought is conditioned by a certain intra-cerebral movement of molecules and atoms; and, on the other hand, this same thought has no consciousness of this molecular movement. It does not know the path of the wave in our nerves; it does not suspect, for example, that the image of the objects is reversed in the retina, or that the excitements of the right eye for the most part go into the left hemisphere. In a word, it is no anatomist. It is a very curious thing that our consciousness enters into relation only with the extra-cerebral, the external objects, and the superficies of our bodies.

From this, this exact question suggests itself: a molecular wave must come as far as our visual cerebral centre for us to have the perception of the

object before our eyes; how is it that our consciousness is unaware of this physiological event from which it depends, and is borne towards the distant object as if it sprang forth outside our nervous system?

Let us first remark, that if we do not perceive this wave, yet it must contain all we know of the external object, for it is evident that we only know of it that part of its properties which it transmits to our nerves and our nerve centres. All the known substance of the external object is, then, implied in this vibration; it is there, but it is not there by itself. The vibration is the work of two collaborators; it expresses at once the nature of the object which provokes it, and the nature of the nerve apparatus which transports it, as the furrow traced in the wax of the phonograph implies the joint action of an aërial vibration with a stylus, a cylinder, and, a clock-work apparatus.

I therefore suppose—and this is, I say it plainly, but an hypothesis—that if the nervous vibration so little resembles the external excitant which generates it, it is because the factor nervous system superadds its effect to the factor excitant. Let us imagine, now, that we have managed to separate these two effects, and we shall understand that then the nervous event so analysed might resemble only the object, or only the nervous system. Now, of these two effects, one is constant, that one which represents the action of the nervous system; there is another which varies with each new perception, and even with every moment of the same perception—that is to say, the object. It is not impossible to understand that the consciousness remains deaf to the constant and sensitive to the variable element. There is a law of consciousness which has often been described, and fresh applications of which are met with daily: this is, that the consciousness only maintains itself by change, whether this change results from the exterior by impressions received, or is produced from the interior by movements of the attention. Let us here apply this empirical law, and admit that it contains a first principle. It will then be possible for us to understand that the consciousness formed into a dialyser of the undulation may reject that constant element which expresses the contribution of the nervous system, and may lay bare the variable element which corresponds to the object: so that an intestinal movement of the cerebral substance, brought to light by this analytical consciousness, may become the perception of an object. By accepting this hypothesis, we restore to the sensory nerves and to the encephalic centres their property of being the substrata of representation,

and avoid the objection made above against materialism and parallelism, that they did not explain how a cerebral movement, which is material, can engender the perception of an object which differs greatly from it and is yet as material as the movement itself. There is not here, properly speaking, either generation, transformation, or metamorphosis. The object to be perceived is contained in the nerve current. It is, as it were, rolled up in it; and it must be made to go forth from the wave to be seen. This last is the work of the consciousness.

FOOTNOTES:

[51] See [Note 43] on p. 191.

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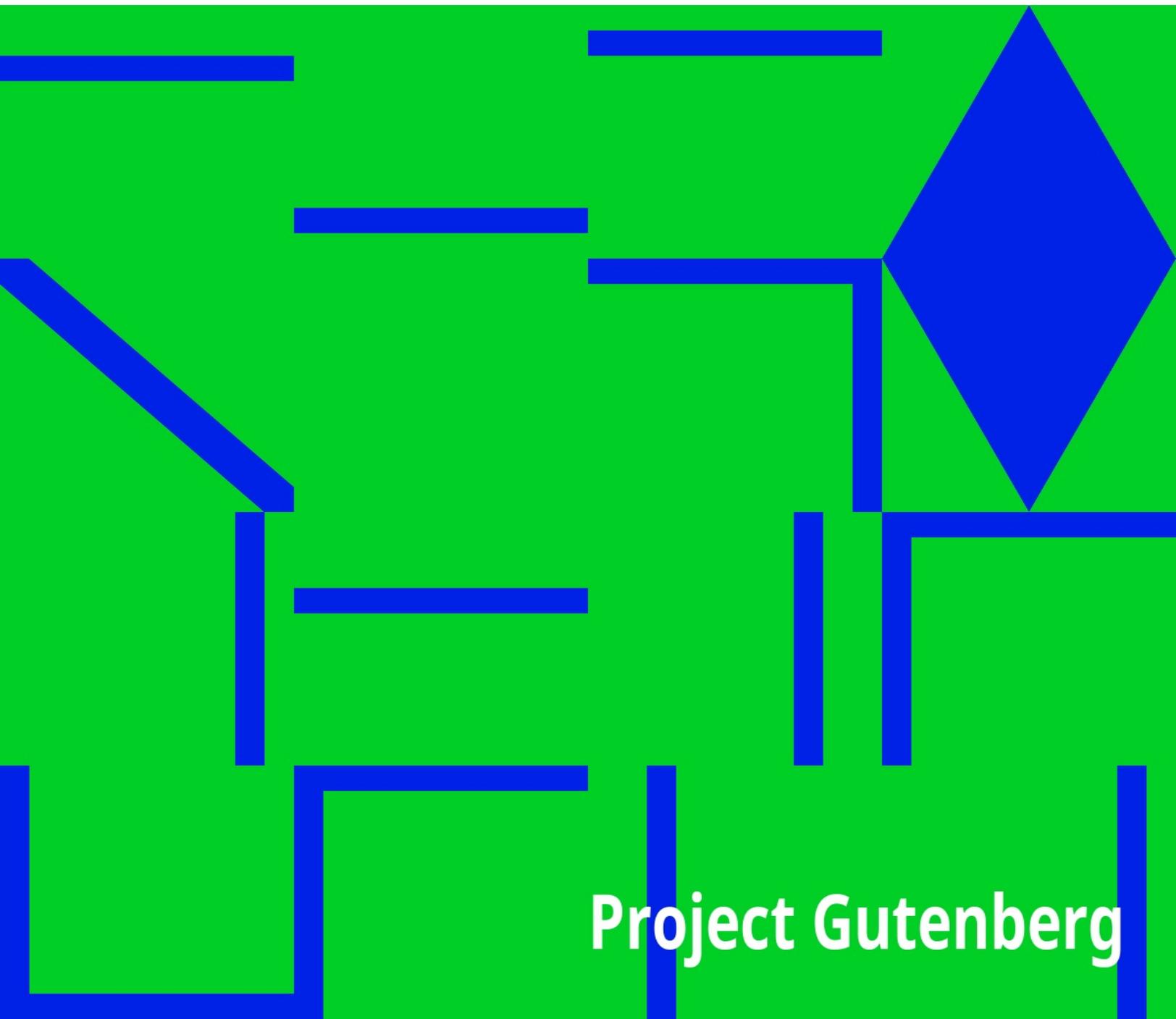
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WITH AN INTRODUCTION BY

ANDRÉ TRIDON

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INTRODUCTION

The medical profession is justly conservative. Human life should not be considered as the proper material for wild experiments.

Conservatism, however, is too often a welcome excuse for lazy minds, loath to adapt themselves to fast changing conditions.

Remember the scornful reception which first was accorded to Freud's discoveries in the domain of the unconscious.

When after years of patient observations, he finally decided to appear before medical bodies to tell them modestly of some facts which always recurred in his dream and his patients' dreams, he was first laughed at and then avoided as a crank.

The words "dream interpretation" were and still are indeed fraught with unpleasant, unscientific associations. They remind one of all sorts of childish, superstitious notions, which make up the thread and woof of dream books, read by none but the ignorant and the primitive.

The wealth of detail, the infinite care never to let anything pass unexplained, with which he presented to the public the result of his investigations, are impressing more and more serious-minded scientists, but the examination of his evidential data demands arduous work and presupposes an absolutely open mind.

This is why we still encounter men, totally unfamiliar with Freud's writings, men who were not even interested enough in the subject to attempt an interpretation of their dreams or their patients' dreams, deriding Freud's theories and combatting them with the help of statements which he never made.

Some of them, like Professor Boris Sidis, reach at times conclusions which are strangely similar to Freud's, but in their ignorance of psychoanalytic

literature, they fail to credit Freud for observations antedating theirs.

Besides those who sneer at dream study, because they have never looked into the subject, there are those who do not dare to face the facts revealed by dream study. Dreams tell us many an unpleasant biological truth about ourselves and only very free minds can thrive on such a diet. Self-deception is a plant which withers fast in the pellucid atmosphere of dream investigation.

The weakling and the neurotic attached to his neurosis are not anxious to turn such a powerful searchlight upon the dark corners of their psychology.

Freud's theories are anything but theoretical.

He was moved by the fact that there always seemed to be a close connection between his patients' dreams and their mental abnormalities, to collect thousands of dreams and to compare them with the case histories in his possession.

He did not start out with a preconceived bias, hoping to find evidence which might support his views. He looked at facts a thousand times "until they began to tell him something."

His attitude toward dream study was, in other words, that of a statistician who does not know, and has no means of foreseeing, what conclusions will be forced on him by the information he is gathering, but who is fully prepared to accept those unavoidable conclusions.

This was indeed a novel way in psychology. Psychologists had always been wont to build, in what Bleuler calls "autistic ways," that is through methods in no wise supported by evidence, some attractive hypothesis, which sprung from their brain, like Minerva from Jove's brain, fully armed.

After which, they would stretch upon that unyielding frame the hide of a reality which they had previously killed.

It is only to minds suffering from the same distortions, to minds also autistically inclined, that those empty, artificial structures appear acceptable

molds for philosophic thinking.

The pragmatic view that "truth is what works" had not been as yet expressed when Freud published his revolutionary views on the psychology of dreams.

Five facts of first magnitude were made obvious to the world by his interpretation of dreams.

First of all, Freud pointed out a constant connection between some part of every dream and some detail of the dreamer's life during the previous waking state. This positively establishes a relation between sleeping states and waking states and disposes of the widely prevalent view that dreams are purely nonsensical phenomena coming from nowhere and leading nowhere.

Secondly, Freud, after studying the dreamer's life and modes of thought, after noting down all his mannerisms and the apparently insignificant details of his conduct which reveal his secret thoughts, came to the conclusion that there was in every dream the attempted or successful gratification of some wish, conscious or unconscious.

Thirdly, he proved that many of our dream visions are symbolical, which causes us to consider them as absurd and unintelligible; the universality of those symbols, however, makes them very transparent to the trained observer.

Fourthly, Freud showed that sexual desires play an enormous part in our unconscious, a part which puritanical hypocrisy has always tried to minimize, if not to ignore entirely.

Finally, Freud established a direct connection between dreams and insanity, between the symbolic visions of our sleep and the symbolic actions of the mentally deranged.

There were, of course, many other observations which Freud made while dissecting the dreams of his patients, but not all of them present as much interest as the foregoing nor were they as revolutionary or likely to wield as much influence on modern psychiatry.

Other explorers have struck the path blazed by Freud and leading into man's unconscious. Jung of Zurich, Adler of Vienna and Kempf of Washington, D.C., have made to the study of the unconscious, contributions which have brought that study into fields which Freud himself never dreamt of invading.

One fact which cannot be too emphatically stated, however, is that but for Freud's wishfulfillment theory of dreams, neither Jung's "energetic theory," nor Adler's theory of "organ inferiority and compensation," nor Kempf's "dynamic mechanism" might have been formulated.

Freud is the father of modern abnormal psychology and he established the psychoanalytical point of view. No one who is not well grounded in Freudian lore can hope to achieve any work of value in the field of psychoanalysis.

On the other hand, let no one repeat the absurd assertion that Freudism is a sort of religion bounded with dogmas and requiring an act of faith. Freudism as such was merely a stage in the development of psychoanalysis, a stage out of which all but a few bigoted camp followers, totally lacking in originality, have evolved. Thousands of stones have been added to the structure erected by the Viennese physician and many more will be added in the course of time.

But the new additions to that structure would collapse like a house of cards but for the original foundations which are as indestructible as Harvey's statement as to the circulation of the blood.

Regardless of whatever additions or changes have been made to the original structure, the analytic point of view remains unchanged.

That point of view is not only revolutionising all the methods of diagnosis and treatment of mental derangements, but compelling the intelligent, up-to-date physician to revise entirely his attitude to almost every kind of disease.

The insane are no longer absurd and pitiable people, to be herded in asylums till nature either cures them or relieves them, through death, of

their misery. The insane who have not been made so by actual injury to their brain or nervous system, are the victims of unconscious forces which cause them to do abnormally things which they might be helped to do normally.

Insight into one's psychology is replacing victoriously sedatives and rest cures.

Physicians dealing with "purely" physical cases have begun to take into serious consideration the "mental" factors which have predisposed a patient to certain ailments.

Freud's views have also made a revision of all ethical and social values unavoidable and have thrown an unexpected flood of light upon literary and artistic accomplishment.

But the Freudian point of view, or more broadly speaking, the psychoanalytic point of view, shall ever remain a puzzle to those who, from laziness or indifference, refuse to survey with the great Viennese the field over which he carefully groped his way. We shall never be convinced until we repeat under his guidance all his laboratory experiments.

We must follow him through the thickets of the unconscious, through the land which had never been charted because academic philosophers, following the line of least effort, had decided *a priori* that it could not be charted.

Ancient geographers, when exhausting their store of information about distant lands, yielded to an unscientific craving for romance and, without any evidence to support their day dreams, filled the blank spaces left on their maps by unexplored tracts with amusing inserts such as "Here there are lions."

Thanks to Freud's interpretation of dreams the "royal road" into the unconscious is now open to all explorers. They shall not find lions, they shall find man himself, and the record of all his life and of his struggle with reality.

And it is only after seeing man as his unconscious, revealed by his dreams, presents him to us that we shall understand him fully. For as Freud said to Putnam: "We are what we are because we have been what we have been."

Not a few serious-minded students, however, have been discouraged from attempting a study of Freud's dream psychology.

The book in which he originally offered to the world his interpretation of dreams was as circumstantial as a legal record to be pondered over by scientists at their leisure, not to be assimilated in a few hours by the average alert reader. In those days, Freud could not leave out any detail likely to make his extremely novel thesis evidentially acceptable to those willing to sift data.

Freud himself, however, realized the magnitude of the task which the reading of his *magnum opus* imposed upon those who have not been prepared for it by long psychological and scientific training and he abstracted from that gigantic work the parts which constitute the essential of his discoveries.

The publishers of the present book deserve credit for presenting to the reading public the gist of Freud's psychology in the master's own words, and in a form which shall neither discourage beginners, nor appear too elementary to those who are more advanced in psychoanalytic study.

Dream psychology is the key to Freud's works and to all modern psychology. With a simple, compact manual such as *Dream Psychology* there shall be no longer any excuse for ignorance of the most revolutionary psychological system of modern times.

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DREAM PSYCHOLOGY

I

DREAMS HAVE A MEANING

In what we may term "prescientific days" people were in no uncertainty about the interpretation of dreams. When they were recalled after awakening they were regarded as either the friendly or hostile manifestation of some higher powers, demoniacal and Divine. With the rise of scientific thought the whole of this expressive mythology was transferred to psychology; to-day there is but a small minority among educated persons who doubt that the dream is the dreamer's own psychical act.

But since the downfall of the mythological hypothesis an interpretation of the dream has been wanting. The conditions of its origin; its relationship to our psychical life when we are awake; its independence of disturbances which, during the state of sleep, seem to compel notice; its many peculiarities repugnant to our waking thought; the incongruence between its images and the feelings they engender; then the dream's evanescence, the way in which, on awakening, our thoughts thrust it aside as something bizarre, and our reminiscences mutilating or rejecting it—all these and many other problems have for many hundred years demanded answers which up till now could never have been satisfactory. Before all there is the question as to the meaning of the dream, a question which is in itself double-sided. There is, firstly, the psychical significance of the dream, its position with regard to the psychical processes, as to a possible biological function; secondly, has the dream a meaning—can sense be made of each single dream as of other mental syntheses?

Three tendencies can be observed in the estimation of dreams. Many philosophers have given currency to one of these tendencies, one which at the same time preserves something of the dream's former over-valuation. The foundation of dream life is for them a peculiar state of psychical activity, which they even celebrate as elevation to some higher state. Schubert, for instance, claims: "The dream is the liberation of the spirit from the pressure of external nature, a detachment of the soul from the

fetters of matter." Not all go so far as this, but many maintain that dreams have their origin in real spiritual excitations, and are the outward manifestations of spiritual powers whose free movements have been hampered during the day ("Dream Phantasies," Scherner, Volkelt). A large number of observers acknowledge that dream life is capable of extraordinary achievements—at any rate, in certain fields ("Memory").

In striking contradiction with this the majority of medical writers hardly admit that the dream is a psychical phenomenon at all. According to them dreams are provoked and initiated exclusively by stimuli proceeding from the senses or the body, which either reach the sleeper from without or are accidental disturbances of his internal organs. The dream has no greater claim to meaning and importance than the sound called forth by the ten fingers of a person quite unacquainted with music running his fingers over the keys of an instrument. The dream is to be regarded, says Binz, "as a physical process always useless, frequently morbid." All the peculiarities of dream life are explicable as the incoherent effort, due to some physiological stimulus, of certain organs, or of the cortical elements of a brain otherwise asleep.

But slightly affected by scientific opinion and untroubled as to the origin of dreams, the popular view holds firmly to the belief that dreams really have got a meaning, in some way they do foretell the future, whilst the meaning can be unravelled in some way or other from its oft bizarre and enigmatical content. The reading of dreams consists in replacing the events of the dream, so far as remembered, by other events. This is done either scene by scene, *according to some rigid key*, or the dream as a whole is replaced by something else of which it was a *symbol*. Serious-minded persons laugh at these efforts—"Dreams are but sea-foam!"

One day I discovered to my amazement that the popular view grounded in superstition, and not the medical one, comes nearer to the truth about dreams. I arrived at new conclusions about dreams by the use of a new method of psychological investigation, one which had rendered me good service in the investigation of phobias, obsessions, illusions, and the like, and which, under the name "psycho-analysis," had found acceptance by a whole school of investigators. The manifold analogies of dream life with

the most diverse conditions of psychical disease in the waking state have been rightly insisted upon by a number of medical observers. It seemed, therefore, *a priori*, hopeful to apply to the interpretation of dreams methods of investigation which had been tested in psychopathological processes. Obsessions and those peculiar sensations of haunting dread remain as strange to normal consciousness as do dreams to our waking consciousness; their origin is as unknown to consciousness as is that of dreams. It was practical ends that impelled us, in these diseases, to fathom their origin and formation. Experience had shown us that a cure and a consequent mastery of the obsessing ideas did result when once those thoughts, the connecting links between the morbid ideas and the rest of the psychical content, were revealed which were heretofore veiled from consciousness. The procedure I employed for the interpretation of dreams thus arose from psychotherapy.

This procedure is readily described, although its practice demands instruction and experience. Suppose the patient is suffering from intense morbid dread. He is requested to direct his attention to the idea in question, without, however, as he has so frequently done, meditating upon it. Every impression about it, without any exception, which occurs to him should be imparted to the doctor. The statement which will be perhaps then made, that he cannot concentrate his attention upon anything at all, is to be countered by assuring him most positively that such a blank state of mind is utterly impossible. As a matter of fact, a great number of impressions will soon occur, with which others will associate themselves. These will be invariably accompanied by the expression of the observer's opinion that they have no meaning or are unimportant. It will be at once noticed that it is this self-criticism which prevented the patient from imparting the ideas, which had indeed already excluded them from consciousness. If the patient can be induced to abandon this self-criticism and to pursue the trains of thought which are yielded by concentrating the attention, most significant matter will be obtained, matter which will be presently seen to be clearly linked to the morbid idea in question. Its connection with other ideas will be manifest, and later on will permit the replacement of the morbid idea by a fresh one, which is perfectly adapted to psychical continuity.

This is not the place to examine thoroughly the hypothesis upon which this experiment rests, or the deductions which follow from its invariable

success. It must suffice to state that we obtain matter enough for the resolution of every morbid idea if we especially direct our attention to the *unbidden* associations *which disturb our thoughts*—those which are otherwise put aside by the critic as worthless refuse. If the procedure is exercised on oneself, the best plan of helping the experiment is to write down at once all one's first indistinct fancies.

I will now point out where this method leads when I apply it to the examination of dreams. Any dream could be made use of in this way. From certain motives I, however, choose a dream of my own, which appears confused and meaningless to my memory, and one which has the advantage of brevity. Probably my dream of last night satisfies the requirements. Its content, fixed immediately after awakening, runs as follows:

"Company; at table or table d'hôte.... Spinach is served. Mrs. E.L., sitting next to me, gives me her undivided attention, and places her hand familiarly upon my knee. In defence I remove her hand. Then she says: 'But you have always had such beautiful eyes.'.... I then distinctly see something like two eyes as a sketch or as the contour of a spectacle lens...."

This is the whole dream, or, at all events, all that I can remember. It appears to me not only obscure and meaningless, but more especially odd. Mrs. E.L. is a person with whom I am scarcely on visiting terms, nor to my knowledge have I ever desired any more cordial relationship. I have not seen her for a long time, and do not think there was any mention of her recently. No emotion whatever accompanied the dream process.

Reflecting upon this dream does not make it a bit clearer to my mind. I will now, however, present the ideas, without premeditation and without criticism, which introspection yielded. I soon notice that it is an advantage to break up the dream into its elements, and to search out the ideas which link themselves to each fragment.

Company; at table or table d'hôte. The recollection of the slight event with which the evening of yesterday ended is at once called up. I left a small party in the company of a friend, who offered to drive me home in his cab. "I prefer a taxi," he said; "that gives one such a pleasant occupation; there is always something to look at." When we were in the cab, and the cab-driver

turned the disc so that the first sixty hellers were visible, I continued the jest. "We have hardly got in and we already owe sixty hellers. The taxi always reminds me of the table d'hôte. It makes me avaricious and selfish by continuously reminding me of my debt. It seems to me to mount up too quickly, and I am always afraid that I shall be at a disadvantage, just as I cannot resist at table d'hôte the comical fear that I am getting too little, that I must look after myself." In far-fetched connection with this I quote:

"To earth, this weary earth, ye bring us,
To guilt ye let us heedless go."

Another idea about the table d'hôte. A few weeks ago I was very cross with my dear wife at the dinner-table at a Tyrolese health resort, because she was not sufficiently reserved with some neighbors with whom I wished to have absolutely nothing to do. I begged her to occupy herself rather with me than with the strangers. That is just as if I had *been at a disadvantage at the table d'hôte*. The contrast between the behavior of my wife at the table and that of Mrs. E.L. in the dream now strikes me: "*Addresses herself entirely to me.*"

Further, I now notice that the dream is the reproduction of a little scene which transpired between my wife and myself when I was secretly courting her. The caressing under cover of the tablecloth was an answer to a wooer's passionate letter. In the dream, however, my wife is replaced by the unfamiliar E.L.

Mrs. E.L. is the daughter of a man to whom I *owed money!* I cannot help noticing that here there is revealed an unsuspected connection between the dream content and my thoughts. If the chain of associations be followed up which proceeds from one element of the dream one is soon led back to another of its elements. The thoughts evoked by the dream stir up associations which were not noticeable in the dream itself.

Is it not customary, when some one expects others to look after his interests without any advantage to themselves, to ask the innocent question satirically: "Do you think this will be done *for the sake of your beautiful eyes?*" Hence Mrs. E.L.'s speech in the dream. "You have always had such beautiful eyes," means nothing but "people always do everything to you for love of you; you have had *everything for nothing.*" The contrary is, of

course, the truth; I have always paid dearly for whatever kindness others have shown me. Still, the fact that *I had a ride for nothing* yesterday when my friend drove me home in his cab must have made an impression upon me.

In any case, the friend whose guests we were yesterday has often made me his debtor. Recently I allowed an opportunity of requiting him to go by. He has had only one present from me, an antique shawl, upon which eyes are painted all round, a so-called Occhiale, as a *charm* against the *Malocchio*. Moreover, he is an *eye specialist*. That same evening I had asked him after a patient whom I had sent to him for *glasses*.

As I remarked, nearly all parts of the dream have been brought into this new connection. I still might ask why in the dream it was *spinach* that was served up. Because spinach called up a little scene which recently occurred at our table. A child, whose *beautiful eyes* are really deserving of praise, refused to eat spinach. As a child I was just the same; for a long time I loathed *spinach*, until in later life my tastes altered, and it became one of my favorite dishes. The mention of this dish brings my own childhood and that of my child's near together. "You should be glad that you have some spinach," his mother had said to the little gourmet. "Some children would be very glad to get spinach." Thus I am reminded of the parents' duties towards their children. Goethe's words—

"To earth, this weary earth, ye bring us,
To guilt ye let us heedless go"—

take on another meaning in this connection.

Here I will stop in order that I may recapitulate the results of the analysis of the dream. By following the associations which were linked to the single elements of the dream torn from their context, I have been led to a series of thoughts and reminiscences where I am bound to recognize interesting expressions of my psychological life. The matter yielded by an analysis of the dream stands in intimate relationship with the dream content, but this relationship is so special that I should never have been able to have inferred the new discoveries directly from the dream itself. The dream was passionless, disconnected, and unintelligible. During the time that I am

unfolding the thoughts at the back of the dream I feel intense and well-grounded emotions. The thoughts themselves fit beautifully together into chains logically bound together with certain central ideas which ever repeat themselves. Such ideas not represented in the dream itself are in this instance the antitheses *selfish, unselfish, to be indebted, to work for nothing*. I could draw closer the threads of the web which analysis has disclosed, and would then be able to show how they all run together into a single knot; I am debarred from making this work public by considerations of a private, not of a scientific, nature. After having cleared up many things which I do not willingly acknowledge as mine, I should have much to reveal which had better remain my secret. Why, then, do not I choose another dream whose analysis would be more suitable for publication, so that I could awaken a fairer conviction of the sense and cohesion of the results disclosed by analysis? The answer is, because every dream which I investigate leads to the same difficulties and places me under the same need of discretion; nor should I forgo this difficulty any the more were I to analyze the dream of some one else. That could only be done when opportunity allowed all concealment to be dropped without injury to those who trusted me.

The conclusion which is now forced upon me is that the dream is a *sort of substitution* for those emotional and intellectual trains of thought which I attained after complete analysis. I do not yet know the process by which the dream arose from those thoughts, but I perceive that it is wrong to regard the dream as psychically unimportant, a purely physical process which has arisen from the activity of isolated cortical elements awakened out of sleep.

I must further remark that the dream is far shorter than the thoughts which I hold it replaces; whilst analysis discovered that the dream was provoked by an unimportant occurrence the evening before the dream.

Naturally, I would not draw such far-reaching conclusions if only one analysis were known to me. Experience has shown me that when the associations of any dream are honestly followed such a chain of thought is revealed, the constituent parts of the dream reappear correctly and sensibly linked together; the slight suspicion that this concatenation was merely an accident of a single first observation must, therefore, be absolutely relinquished. I regard it, therefore, as my right to establish this new view by

a proper nomenclature. I contrast the dream which my memory evokes with the dream and other added matter revealed by analysis: the former I call the dream's *manifest content*; the latter, without at first further subdivision, its *latent content*. I arrive at two new problems hitherto unformulated: (1) What is the psychical process which has transformed the latent content of the dream into its manifest content? (2) What is the motive or the motives which have made such transformation exigent? The process by which the change from latent to manifest content is executed I name the *dream-work*. In contrast with this is the *work of analysis*, which produces the reverse transformation. The other problems of the dream—the inquiry as to its stimuli, as to the source of its materials, as to its possible purpose, the function of dreaming, the forgetting of dreams—these I will discuss in connection with the latent dream-content.

I shall take every care to avoid a confusion between the *manifest* and the *latent content*, for I ascribe all the contradictory as well as the incorrect accounts of dream-life to the ignorance of this latent content, now first laid bare through analysis.

The conversion of the latent dream thoughts into those manifest deserves our close study as the first known example of the transformation of psychical stuff from one mode of expression into another. From a mode of expression which, moreover, is readily intelligible into another which we can only penetrate by effort and with guidance, although this new mode must be equally reckoned as an effort of our own psychical activity. From the standpoint of the relationship of latent to manifest dream-content, dreams can be divided into three classes. We can, in the first place, distinguish those dreams which have a *meaning* and are, at the same time, *intelligible*, which allow us to penetrate into our psychical life without further ado. Such dreams are numerous; they are usually short, and, as a general rule, do not seem very noticeable, because everything remarkable or exciting surprise is absent. Their occurrence is, moreover, a strong argument against the doctrine which derives the dream from the isolated activity of certain cortical elements. All signs of a lowered or subdivided psychical activity are wanting. Yet we never raise any objection to characterizing them as dreams, nor do we confound them with the products of our waking life.

A second group is formed by those dreams which are indeed self-coherent and have a distinct meaning, but appear strange because we are unable to reconcile their meaning with our mental life. That is the case when we dream, for instance, that some dear relative has died of plague when we know of no ground for expecting, apprehending, or assuming anything of the sort; we can only ask ourselves wonderingly: "What brought that into my head?" To the third group those dreams belong which are void of both meaning and intelligibility; they are *incoherent, complicated, and meaningless*. The overwhelming number of our dreams partake of this character, and this has given rise to the contemptuous attitude towards dreams and the medical theory of their limited psychical activity. It is especially in the longer and more complicated dream-plots that signs of incoherence are seldom missing.

The contrast between manifest and latent dream-content is clearly only of value for the dreams of the second and more especially for those of the third class. Here are problems which are only solved when the manifest dream is replaced by its latent content; it was an example of this kind, a complicated and unintelligible dream, that we subjected to analysis. Against our expectation we, however, struck upon reasons which prevented a complete cognizance of the latent dream thought. On the repetition of this same experience we were forced to the supposition that there is an *intimate bond, with laws of its own, between the unintelligible and complicated nature of the dream and the difficulties attending communication of the thoughts connected with the dream*. Before investigating the nature of this bond, it will be advantageous to turn our attention to the more readily intelligible dreams of the first class where, the manifest and latent content being identical, the dream work seems to be omitted.

The investigation of these dreams is also advisable from another standpoint. The dreams of *children* are of this nature; they have a meaning, and are not bizarre. This, by the way, is a further objection to reducing dreams to a dissociation of cerebral activity in sleep, for why should such a lowering of psychical functions belong to the nature of sleep in adults, but not in children? We are, however, fully justified in expecting that the explanation of psychical processes in children, essentially simplified as they may be,

should serve as an indispensable preparation towards the psychology of the adult.

I shall therefore cite some examples of dreams which I have gathered from children. A girl of nineteen months was made to go without food for a day because she had been sick in the morning, and, according to nurse, had made herself ill through eating strawberries. During the night, after her day of fasting, she was heard calling out her name during sleep, and adding: "*Tawberry, eggs, pap.*" She is dreaming that she is eating, and selects out of her menu exactly what she supposes she will not get much of just now.

The same kind of dream about a forbidden dish was that of a little boy of twenty-two months. The day before he was told to offer his uncle a present of a small basket of cherries, of which the child was, of course, only allowed one to taste. He woke up with the joyful news: "Hermann eaten up all the cherries."

A girl of three and a half years had made during the day a sea trip which was too short for her, and she cried when she had to get out of the boat. The next morning her story was that during the night she had been on the sea, thus continuing the interrupted trip.

A boy of five and a half years was not at all pleased with his party during a walk in the Dachstein region. Whenever a new peak came into sight he asked if that were the Dachstein, and, finally, refused to accompany the party to the waterfall. His behavior was ascribed to fatigue; but a better explanation was forthcoming when the next morning he told his dream: *he had ascended the Dachstein*. Obviously he expected the ascent of the Dachstein to be the object of the excursion, and was vexed by not getting a glimpse of the mountain. The dream gave him what the day had withheld. The dream of a girl of six was similar; her father had cut short the walk before reaching the promised objective on account of the lateness of the hour. On the way back she noticed a signpost giving the name of another place for excursions; her father promised to take her there also some other day. She greeted her father next day with the news that she had dreamt that *her father had been with her to both places*.

What is common in all these dreams is obvious. They completely satisfy wishes excited during the day which remain unrealized. They are simply and undisguisedly realizations of wishes.

The following child-dream, not quite understandable at first sight, is nothing else than a wish realized. On account of poliomyelitis a girl, not quite four years of age, was brought from the country into town, and remained over night with a childless aunt in a big—for her, naturally, huge—bed. The next morning she stated that she had dreamt that *the bed was much too small for her, so that she could find no place in it*. To explain this dream as a wish is easy when we remember that to be "big" is a frequently expressed wish of all children. The bigness of the bed reminded Miss Little-Would-be-Big only too forcibly of her smallness. This nasty situation became righted in her dream, and she grew so big that the bed now became too small for her.

Even when children's dreams are complicated and polished, their comprehension as a realization of desire is fairly evident. A boy of eight dreamt that he was being driven with Achilles in a war-chariot, guided by Diomedes. The day before he was assiduously reading about great heroes. It is easy to show that he took these heroes as his models, and regretted that he was not living in those days.

From this short collection a further characteristic of the dreams of children is manifest—*their connection with the life of the day*. The desires which are realized in these dreams are left over from the day or, as a rule, the day previous, and the feeling has become intently emphasized and fixed during the day thoughts. Accidental and indifferent matters, or what must appear so to the child, find no acceptance in the contents of the dream.

Innumerable instances of such dreams of the infantile type can be found among adults also, but, as mentioned, these are mostly exactly like the manifest content. Thus, a random selection of persons will generally respond to thirst at night-time with a dream about drinking, thus striving to get rid of the sensation and to let sleep continue. Many persons frequently have these comforting *dreams* before waking, just when they are called. They then dream that they are already up, that they are washing, or already in school, at the office, etc., where they ought to be at a given time. The

night before an intended journey one not infrequently dreams that one has already arrived at the destination; before going to a play or to a party the dream not infrequently anticipates, in impatience, as it were, the expected pleasure. At other times the dream expresses the realization of the desire somewhat indirectly; some connection, some sequel must be known—the first step towards recognizing the desire. Thus, when a husband related to me the dream of his young wife, that her monthly period had begun, I had to bethink myself that the young wife would have expected a pregnancy if the period had been absent. The dream is then a sign of pregnancy. Its meaning is that it shows the wish realized that pregnancy should not occur just yet. Under unusual and extreme circumstances, these dreams of the infantile type become very frequent. The leader of a polar expedition tells us, for instance, that during the wintering amid the ice the crew, with their monotonous diet and slight rations, dreamt regularly, like children, of fine meals, of mountains of tobacco, and of home.

It is not uncommon that out of some long, complicated and intricate dream one specially lucid part stands out containing unmistakably the realization of a desire, but bound up with much unintelligible matter. On more frequently analyzing the seemingly more transparent dreams of adults, it is astonishing to discover that these are rarely as simple as the dreams of children, and that they cover another meaning beyond that of the realization of a wish.

It would certainly be a simple and convenient solution of the riddle if the work of analysis made it at all possible for us to trace the meaningless and intricate dreams of adults back to the infantile type, to the realization of some intensely experienced desire of the day. But there is no warrant for such an expectation. Their dreams are generally full of the most indifferent and bizarre matter, and no trace of the realization of the wish is to be found in their content.

Before leaving these infantile dreams, which are obviously unrealized desires, we must not fail to mention another chief characteristic of dreams, one that has been long noticed, and one which stands out most clearly in this class. I can replace any of these dreams by a phrase expressing a desire. If the sea trip had only lasted longer; if I were only washed and dressed; if I

had only been allowed to keep the cherries instead of giving them to my uncle. But the dream gives something more than the choice, for here the desire is already realized; its realization is real and actual. The dream presentations consist chiefly, if not wholly, of scenes and mainly of visual sense images. Hence a kind of transformation is not entirely absent in this class of dreams, and this may be fairly designated as the dream work. *An idea merely existing in the region of possibility is replaced by a vision of its accomplishment.*

II

THE DREAM MECHANISM

We are compelled to assume that such transformation of scene has also taken place in intricate dreams, though we do not know whether it has encountered any possible desire. The dream instanced at the commencement, which we analyzed somewhat thoroughly, did give us occasion in two places to suspect something of the kind. Analysis brought out that my wife was occupied with others at table, and that I did not like it; in the dream itself *exactly the opposite* occurs, for the person who replaces my wife gives me her undivided attention. But can one wish for anything pleasanter after a disagreeable incident than that the exact contrary should have occurred, just as the dream has it? The stinging thought in the analysis, that I have never had anything for nothing, is similarly connected with the woman's remark in the dream: "You have always had such beautiful eyes." Some portion of the opposition between the latent and manifest content of the dream must be therefore derived from the realization of a wish.

Another manifestation of the dream work which all incoherent dreams have in common is still more noticeable. Choose any instance, and compare the number of separate elements in it, or the extent of the dream, if written down, with the dream thoughts yielded by analysis, and of which but a trace can be refound in the dream itself. There can be no doubt that the dream working has resulted in an extraordinary compression or *condensation*. It is not at first easy to form an opinion as to the extent of the condensation; the more deeply you go into the analysis, the more deeply you are impressed by it. There will be found no factor in the dream whence the chains of associations do not lead in two or more directions, no scene which has not been pieced together out of two or more impressions and events. For instance, I once dreamt about a kind of swimming-bath where the bathers suddenly separated in all directions; at one place on the edge a person stood bending towards one of the bathers as if to drag him out. The scene was a composite one, made up out of an event that occurred at the time of puberty, and of two pictures, one of which I had seen just shortly before the dream.

The two pictures were *The Surprise in the Bath*, from Schwind's Cycle of the Melusine (note the bathers suddenly separating), and *The Flood*, by an Italian master. The little incident was that I once witnessed a lady, who had tarried in the swimming-bath until the men's hour, being helped out of the water by the swimming-master. The scene in the dream which was selected for analysis led to a whole group of reminiscences, each one of which had contributed to the dream content. First of all came the little episode from the time of my courting, of which I have already spoken; the pressure of a hand under the table gave rise in the dream to the "under the table," which I had subsequently to find a place for in my recollection. There was, of course, at the time not a word about "undivided attention." Analysis taught me that this factor is the realization of a desire through its contradictory and related to the behavior of my wife at the table d'hôte. An exactly similar and much more important episode of our courtship, one which separated us for an entire day, lies hidden behind this recent recollection. The intimacy, the hand resting upon the knee, refers to a quite different connection and to quite other persons. This element in the dream becomes again the starting-point of two distinct series of reminiscences, and so on.

The stuff of the dream thoughts which has been accumulated for the formation of the dream scene must be naturally fit for this application. There must be one or more common factors. The dream work proceeds like Francis Galton with his family photographs. The different elements are put one on top of the other; what is common to the composite picture stands out clearly, the opposing details cancel each other. This process of reproduction partly explains the wavering statements, of a peculiar vagueness, in so many elements of the dream. For the interpretation of dreams this rule holds good: When analysis discloses *uncertainty*, as to *either—or* read *and*, *taking* each section of the apparent alternatives as a separate outlet for a series of impressions.

When there is nothing in common between the dream thoughts, the dream work takes the trouble to create a something, in order to make a common presentation feasible in the dream. The simplest way to approximate two dream thoughts, which have as yet nothing in common, consists in making such a change in the actual expression of one idea as will meet a slight responsive recasting in the form of the other idea. The process is analogous

to that of rhyme, when consonance supplies the desired common factor. A good deal of the dream work consists in the creation of those frequently very witty, but often exaggerated, digressions. These vary from the common presentation in the dream content to dream thoughts which are as varied as are the causes in form and essence which give rise to them. In the analysis of our example of a dream, I find a like case of the transformation of a thought in order that it might agree with another essentially foreign one. In following out the analysis I struck upon the thought: *I should like to have something for nothing*. But this formula is not serviceable to the dream. Hence it is replaced by another one: "I should like to enjoy something free of cost."¹ The word "kost" (taste), with its double meaning, is appropriate to a table d'hôte; it, moreover, is in place through the special sense in the dream. At home if there is a dish which the children decline, their mother first tries gentle persuasion, with a "Just taste it." That the dream work should unhesitatingly use the double meaning of the word is certainly remarkable; ample experience has shown, however, that the occurrence is quite usual.

Through condensation of the dream certain constituent parts of its content are explicable which are peculiar to the dream life alone, and which are not found in the waking state. Such are the composite and mixed persons, the extraordinary mixed figures, creations comparable with the fantastic animal compositions of Orientals; a moment's thought and these are reduced to unity, whilst the fancies of the dream are ever formed anew in an inexhaustible profusion. Every one knows such images in his own dreams; manifold are their origins. I can build up a person by borrowing one feature from one person and one from another, or by giving to the form of one the name of another in my dream. I can also visualize one person, but place him in a position which has occurred to another. There is a meaning in all these cases when different persons are amalgamated into one substitute. Such cases denote an "and," a "just like," a comparison of the original person from a certain point of view, a comparison which can be also realized in the dream itself. As a rule, however, the identity of the blended persons is only discoverable by analysis, and is only indicated in the dream content by the formation of the "combined" person.

The same diversity in their ways of formation and the same rules for its solution hold good also for the innumerable medley of dream contents, examples of which I need scarcely adduce. Their strangeness quite disappears when we resolve not to place them on a level with the objects of perception as known to us when awake, but to remember that they represent the art of dream condensation by an exclusion of unnecessary detail. Prominence is given to the common character of the combination. Analysis must also generally supply the common features. The dream says simply: *All these things have an "x" in common*. The decomposition of these mixed images by analysis is often the quickest way to an interpretation of the dream. Thus I once dreamt that I was sitting with one of my former university tutors on a bench, which was undergoing a rapid continuous movement amidst other benches. This was a combination of lecture-room and moving staircase. I will not pursue the further result of the thought. Another time I was sitting in a carriage, and on my lap an object in shape like a top-hat, which, however, was made of transparent glass. The scene at once brought to my mind the proverb: "He who keeps his hat in his hand will travel safely through the land." By a slight turn the *glass hat* reminded me of *Auer's light*, and I knew that I was about to invent something which was to make me as rich and independent as his invention had made my countryman, Dr. Auer, of Welsbach; then I should be able to travel instead of remaining in Vienna. In the dream I was traveling with my invention, with the, it is true, rather awkward glass top-hat. The dream work is peculiarly adept at representing two contradictory conceptions by means of the same mixed image. Thus, for instance, a woman dreamt of herself carrying a tall flower-stalk, as in the picture of the Annunciation (Chastity-Mary is her own name), but the stalk was bedecked with thick white blossoms resembling camellias (contrast with chastity: *La dame aux Camelias*).

A great deal of what we have called "dream condensation" can be thus formulated. Each one of the elements of the dream content is *overdetermined* by the matter of the dream thoughts; it is not derived from one element of these thoughts, but from a whole series. These are not necessarily interconnected in any way, but may belong to the most diverse spheres of thought. The dream element truly represents all this disparate matter in the dream content. Analysis, moreover, discloses another side of

the relationship between dream content and dream thoughts. Just as one element of the dream leads to associations with several dream thoughts, so, as a rule, the *one dream thought represents more than one dream element*. The threads of the association do not simply converge from the dream thoughts to the dream content, but on the way they overlap and interweave in every way.

Next to the transformation of one thought in the scene (its "dramatization"), condensation is the most important and most characteristic feature of the dream work. We have as yet no clue as to the motive calling for such compression of the content.

In the complicated and intricate dreams with which we are now concerned, condensation and dramatization do not wholly account for the difference between dream contents and dream thoughts. There is evidence of a third factor, which deserves careful consideration.

When I have arrived at an understanding of the dream thoughts by my analysis I notice, above all, that the matter of the manifest is very different from that of the latent dream content. That is, I admit, only an apparent difference which vanishes on closer investigation, for in the end I find the whole dream content carried out in the dream thoughts, nearly all the dream thoughts again represented in the dream content. Nevertheless, there does remain a certain amount of difference.

The essential content which stood out clearly and broadly in the dream must, after analysis, rest satisfied with a very subordinate rôle among the dream thoughts. These very dream thoughts which, going by my feelings, have a claim to the greatest importance are either not present at all in the dream content, or are represented by some remote allusion in some obscure region of the dream. I can thus describe these phenomena: *During the dream work the psychical intensity of those thoughts and conceptions to which it properly pertains flows to others which, in my judgment, have no claim to such emphasis*. There is no other process which contributes so much to concealment of the dream's meaning and to make the connection between the dream content and dream ideas irrecognizable. During this process, which I will call *the dream displacement*, I notice also the psychical intensity, significance, or emotional nature of the thoughts

become transposed in sensory vividness. What was clearest in the dream seems to me, without further consideration, the most important; but often in some obscure element of the dream I can recognize the most direct offspring of the principal dream thought.

I could only designate this dream displacement as the *transvaluation of psychological values*. The phenomena will not have been considered in all its bearings unless I add that this displacement or transvaluation is shared by different dreams in extremely varying degrees. There are dreams which take place almost without any displacement. These have the same time, meaning, and intelligibility as we found in the dreams which recorded a desire. In other dreams not a bit of the dream idea has retained its own psychological value, or everything essential in these dream ideas has been replaced by unessentials, whilst every kind of transition between these conditions can be found. The more obscure and intricate a dream is, the greater is the part to be ascribed to the impetus of displacement in its formation.

The example that we chose for analysis shows, at least, this much of displacement—that its content has a different center of interest from that of the dream ideas. In the forefront of the dream content the main scene appears as if a woman wished to make advances to me; in the dream idea the chief interest rests on the desire to enjoy disinterested love which shall "cost nothing"; this idea lies at the back of the talk about the beautiful eyes and the far-fetched allusion to "spinach."

If we abolish the dream displacement, we attain through analysis quite certain conclusions regarding two problems of the dream which are most disputed—as to what provokes a dream at all, and as to the connection of the dream with our waking life. There are dreams which at once expose their links with the events of the day; in others no trace of such a connection can be found. By the aid of analysis it can be shown that every dream, without any exception, is linked up with our impression of the day, or perhaps it would be more correct to say of the day previous to the dream. The impressions which have incited the dream may be so important that we are not surprised at our being occupied with them whilst awake; in this case we are right in saying that the dream carries on the chief interest of our

waking life. More usually, however, when the dream contains anything relating to the impressions of the day, it is so trivial, unimportant, and so deserving of oblivion, that we can only recall it with an effort. The dream content appears, then, even when coherent and intelligible, to be concerned with those indifferent trifles of thought undeserving of our waking interest. The depreciation of dreams is largely due to the predominance of the indifferent and the worthless in their content.

Analysis destroys the appearance upon which this derogatory judgment is based. When the dream content discloses nothing but some indifferent impression as instigating the dream, analysis ever indicates some significant event, which has been replaced by something indifferent with which it has entered into abundant associations. Where the dream is concerned with uninteresting and unimportant conceptions, analysis reveals the numerous associative paths which connect the trivial with the momentous in the psychical estimation of the individual. *It is only the action of displacement if what is indifferent obtains recognition in the dream content instead of those impressions which are really the stimulus, or instead of the things of real interest.* In answering the question as to what provokes the dream, as to the connection of the dream, in the daily troubles, we must say, in terms of the insight given us by replacing the manifest latent dream content: *The dream does never trouble itself about things which are not deserving of our concern during the day, and trivialities which do not trouble us during the day have no power to pursue us whilst asleep.*

What provoked the dream in the example which we have analyzed? The really unimportant event, that a friend invited me to a *free ride in his cab*. The table d'hôte scene in the dream contains an allusion to this indifferent motive, for in conversation I had brought the taxi parallel with the table d'hôte. But I can indicate the important event which has as its substitute the trivial one. A few days before I had disbursed a large sum of money for a member of my family who is very dear to me. Small wonder, says the dream thought, if this person is grateful to me for this—this love is not cost-free. But love that shall cost nothing is one of the prime thoughts of the dream. The fact that shortly before this I had had several *drives* with the relative in question puts the one drive with my friend in a position to recall the connection with the other person. The indifferent impression which, by

such ramifications, provokes the dream is subservient to another condition which is not true of the real source of the dream—the impression must be a recent one, everything arising from the day of the dream.

I cannot leave the question of dream displacement without the consideration of a remarkable process in the formation of dreams in which condensation and displacement work together towards one end. In condensation we have already considered the case where two conceptions in the dream having something in common, some point of contact, are replaced in the dream content by a mixed image, where the distinct germ corresponds to what is common, and the indistinct secondary modifications to what is distinctive. If displacement is added to condensation, there is no formation of a mixed image, but a *common mean* which bears the same relationship to the individual elements as does the resultant in the parallelogram of forces to its components. In one of my dreams, for instance, there is talk of an injection with *propyl*. On first analysis I discovered an indifferent but true incident where *amyl* played a part as the excitant of the dream. I cannot yet vindicate the exchange of *amyl* for *propyl*. To the round of ideas of the same dream, however, there belongs the recollection of my first visit to Munich, when the *Propylæa* struck me. The attendant circumstances of the analysis render it admissible that the influence of this second group of conceptions caused the displacement of *amyl* to *propyl*. *Propyl* is, so to say, the mean idea between *amyl* and *propylæa*; it got into the dream as a kind of *compromise* by simultaneous condensation and displacement.

The need of discovering some motive for this bewildering work of the dream is even more called for in the case of displacement than in condensation.

Although the work of displacement must be held mainly responsible if the dream thoughts are not refound or recognized in the dream content (unless the motive of the changes be guessed), it is another and milder kind of transformation which will be considered with the dream thoughts which leads to the discovery of a new but readily understood act of the dream work. The first dream thoughts which are unravelled by analysis frequently strike one by their unusual wording. They do not appear to be expressed in the sober form which our thinking prefers; rather are they expressed

symbolically by allegories and metaphors like the figurative language of the poets. It is not difficult to find the motives for this degree of constraint in the expression of dream ideas. The dream content consists chiefly of visual scenes; hence the dream ideas must, in the first place, be prepared to make use of these forms of presentation. Conceive that a political leader's or a barrister's address had to be transposed into pantomime, and it will be easy to understand the transformations to which the dream work is constrained by regard for this *dramatization of the dream content*.

Around the psychical stuff of dream thoughts there are ever found reminiscences of impressions, not infrequently of early childhood—scenes which, as a rule, have been visually grasped. Whenever possible, this portion of the dream ideas exercises a definite influence upon the modelling of the dream content; it works like a center of crystallization, by attracting and rearranging the stuff of the dream thoughts. The scene of the dream is not infrequently nothing but a modified repetition, complicated by interpolations of events that have left such an impression; the dream but very seldom reproduces accurate and unmixed reproductions of real scenes.

The dream content does not, however, consist exclusively of scenes, but it also includes scattered fragments of visual images, conversations, and even bits of unchanged thoughts. It will be perhaps to the point if we instance in the briefest way the means of dramatization which are at the disposal of the dream work for the repetition of the dream thoughts in the peculiar language of the dream.

The dream thoughts which we learn from the analysis exhibit themselves as a psychical complex of the most complicated superstructure. Their parts stand in the most diverse relationship to each other; they form backgrounds and foregrounds, stipulations, digressions, illustrations, demonstrations, and protestations. It may be said to be almost the rule that one train of thought is followed by its contradictory. No feature known to our reason whilst awake is absent. If a dream is to grow out of all this, the psychical matter is submitted to a pressure which condenses it extremely, to an inner shrinking and displacement, creating at the same time fresh surfaces, to a selective interweaving among the constituents best adapted for the construction of these scenes. Having regard to the origin of this stuff, the term *regression*

can be fairly applied to this process. The logical chains which hitherto held the psychical stuff together become lost in this transformation to the dream content. The dream work takes on, as it were, only the essential content of the dream thoughts for elaboration. It is left to analysis to restore the connection which the dream work has destroyed.

The dream's means of expression must therefore be regarded as meager in comparison with those of our imagination, though the dream does not renounce all claims to the restitution of logical relation to the dream thoughts. It rather succeeds with tolerable frequency in replacing these by formal characters of its own.

By reason of the undoubted connection existing between all the parts of dream thoughts, the dream is able to embody this matter into a single scene. It upholds a *logical connection* as *approximation in time and space*, just as the painter, who groups all the poets for his picture of Parnassus who, though they have never been all together on a mountain peak, yet form ideally a community. The dream continues this method of presentation in individual dreams, and often when it displays two elements close together in the dream content it warrants some special inner connection between what they represent in the dream thoughts. It should be, moreover, observed that all the dreams of one night prove on analysis to originate from the same sphere of thought.

The causal connection between two ideas is either left without presentation, or replaced by two different long portions of dreams one after the other. This presentation is frequently a reversed one, the beginning of the dream being the deduction, and its end the hypothesis. The direct *transformation* of one thing into another in the dream seems to serve the relationship of *cause* and *effect*.

The dream never utters the *alternative "either-or,"* but accepts both as having equal rights in the same connection. When "either-or" is used in the reproduction of dreams, it is, as I have already mentioned, to be replaced by "*and*."

Conceptions which stand in opposition to one another are preferably expressed in dreams by the same element.² There seems no "not" in dreams.

Opposition between two ideas, the relation of conversion, is represented in dreams in a very remarkable way. It is expressed by the reversal of another part of the dream content just as if by way of appendix. We shall later on deal with another form of expressing disagreement. The common dream sensation of *movement checked* serves the purpose of representing disagreement of impulses—a *conflict of the will*.

Only one of the logical relationships—that of *similarity, identity, agreement*—is found highly developed in the mechanism of dream formation. Dream work makes use of these cases as a starting-point for condensation, drawing together everything which shows such agreement to a *fresh unity*.

These short, crude observations naturally do not suffice as an estimate of the abundance of the dream's formal means of presenting the logical relationships of the dream thoughts. In this respect, individual dreams are worked up more nicely or more carelessly, our text will have been followed more or less closely, auxiliaries of the dream work will have been taken more or less into consideration. In the latter case they appear obscure, intricate, incoherent. When the dream appears openly absurd, when it contains an obvious paradox in its content, it is so of purpose. Through its apparent disregard of all logical claims, it expresses a part of the intellectual content of the dream ideas. Absurdity in the dream denotes *disagreement, scorn, disdain* in the dream thoughts. As this explanation is in entire disagreement with the view that the dream owes its origin to dissociated, uncritical cerebral activity, I will emphasize my view by an example:

"One of my acquaintances, Mr. M____, has been attacked by no less a person than Goethe in an essay with, we all maintain, unwarrantable violence. Mr. M____ has naturally been ruined by this attack. He complains very bitterly of this at a dinner-party, but his respect for Goethe has not diminished through this personal experience. I now attempt to clear up the chronological relations which strike me as improbable. Goethe died in 1832. As his attack upon Mr. M____ must, of course, have taken place before, Mr. M____ must have been then a very young man. It seems to me plausible that he was eighteen. I am not certain, however, what year we are actually in, and the whole calculation falls into obscurity. The attack was, moreover, contained in Goethe's well-known essay on 'Nature.'"

The absurdity of the dream becomes the more glaring when I state that Mr. M____ is a young business man without any poetical or literary interests. My analysis of the dream will show what method there is in this madness. The dream has derived its material from three sources:

1. Mr. M____, to whom I was introduced at a dinner-party, begged me one day to examine his elder brother, who showed signs of mental trouble. In conversation with the patient, an unpleasant episode occurred. Without the slightest occasion he disclosed one of his brother's *youthful escapades*. I had asked the patient the *year of his birth* (*year of death* in dream), and led him to various calculations which might show up his want of memory.

2. A medical journal which displayed my name among others on the cover had published a *ruinous* review of a book by my friend F____ of Berlin, from the pen of a very *juvenile* reviewer. I communicated with the editor, who, indeed, expressed his regret, but would not promise any redress. Thereupon I broke off my connection with the paper; in my letter of resignation I expressed the hope that our *personal relations would not suffer from this*. Here is the real source of the dream. The derogatory reception of my friend's work had made a deep impression upon me. In my judgment, it contained a fundamental biological discovery which only now, several years later, commences to find favor among the professors.

3. A little while before, a patient gave me the medical history of her brother, who, exclaiming "*Nature, Nature!*" had gone out of his mind. The doctors considered that the exclamation arose from a study of *Goethe's* beautiful essay, and indicated that the patient had been overworking. I expressed the opinion that it seemed more *plausible* to me that the exclamation "*Nature!*" was to be taken in that sexual meaning known also to the less educated in our country. It seemed to me that this view had something in it, because the unfortunate youth afterwards mutilated his genital organs. The patient was eighteen years old when the attack occurred.

The first person in the dream-thoughts behind the ego was my friend who had been so scandalously treated. "*I now attempted to clear up the chronological relation.*" My friend's book deals with the chronological relations of life, and, amongst other things, correlates *Goethe's* duration of life with a number of days in many ways important to biology. The ego is,

however, represented as a general paralytic (*"I am not certain what year we are actually in"*). The dream exhibits my friend as behaving like a general paralytic, and thus riots in absurdity. But the dream thoughts run ironically. "Of course he is a madman, a fool, and you are the genius who understands all about it. But shouldn't it be the *other way round*?" This inversion obviously took place in the dream when Goethe attacked the young man, which is absurd, whilst any one, however young, can to-day easily attack the great Goethe.

I am prepared to maintain that no dream is inspired by other than egoistic emotions. The ego in the dream does not, indeed, represent only my friend, but stands for myself also. I identify myself with him because the fate of his discovery appears to me typical of the acceptance of *my own*. If I were to publish my own theory, which gives sexuality predominance in the ætiology of psychoneurotic disorders (see the allusion to the eighteen-year-old patient—*"Nature, Nature!"*), the same criticism would be leveled at me, and it would even now meet with the same contempt.

When I follow out the dream thoughts closely, I ever find only *scorn* and *contempt* as *correlated with the dream's absurdity*. It is well known that the discovery of a cracked sheep's skull on the Lido in Venice gave Goethe the hint for the so-called vertebral theory of the skull. My friend plumes himself on having as a student raised a hubbub for the resignation of an aged professor who had done good work (including some in this very subject of comparative anatomy), but who, on account of *decrepitude*, had become quite incapable of teaching. The agitation my friend inspired was so successful because in the German Universities an *age limit* is not demanded for academic work. *Age is no protection against folly*. In the hospital here I had for years the honor to serve under a chief who, long fossilized, was for decades notoriously *feble-minded*, and was yet permitted to continue in his responsible office. A trait, after the manner of the find in the Lido, forces itself upon me here. It was to this man that some youthful colleagues in the hospital adapted the then popular slang of that day: "No Goethe has written that," "No Schiller composed that," etc.

We have not exhausted our valuation of the dream work. In addition to condensation, displacement, and definite arrangement of the psychical matter, we must ascribe to it yet another activity—one which is, indeed, not shared by every dream. I shall not treat this position of the dream work exhaustively; I will only point out that the readiest way to arrive at a conception of it is to take for granted, probably unfairly, that it *only subsequently influences the dream content which has already been built up*. Its mode of action thus consists in so coördinating the parts of the dream that these coalesce to a coherent whole, to a dream composition. The dream gets a kind of façade which, it is true, does not conceal the whole of its content. There is a sort of preliminary explanation to be strengthened by interpolations and slight alterations. Such elaboration of the dream content must not be too pronounced; the misconception of the dream thoughts to which it gives rise is merely superficial, and our first piece of work in analyzing a dream is to get rid of these early attempts at interpretation.

The motives for this part of the dream work are easily gauged. This final elaboration of the dream is due to a *regard for intelligibility*—a fact at once betraying the origin of an action which behaves towards the actual dream

content just as our normal psychical action behaves towards some proffered perception that is to our liking. The dream content is thus secured under the pretense of certain expectations, is perceptually classified by the supposition of its intelligibility, thereby risking its falsification, whilst, in fact, the most extraordinary misconceptions arise if the dream can be correlated with nothing familiar. Every one is aware that we are unable to look at any series of unfamiliar signs, or to listen to a discussion of unknown words, without at once making perpetual changes through *our regard for intelligibility*, through our falling back upon what is familiar.

We can call those dreams *properly made up* which are the result of an elaboration in every way analogous to the psychical action of our waking life. In other dreams there is no such action; not even an attempt is made to bring about order and meaning. We regard the dream as "quite mad," because on awaking it is with this last-named part of the dream work, the dream elaboration, that we identify ourselves. So far, however, as our analysis is concerned, the dream, which resembles a medley of disconnected fragments, is of as much value as the one with a smooth and beautifully polished surface. In the former case we are spared, to some extent, the trouble of breaking down the super-elaboration of the dream content.

All the same, it would be an error to see in the dream façade nothing but the misunderstood and somewhat arbitrary elaboration of the dream carried out at the instance of our psychical life. Wishes and phantasies are not infrequently employed in the erection of this façade, which were already fashioned in the dream thoughts; they are akin to those of our waking life—"day-dreams," as they are very properly called. These wishes and phantasies, which analysis discloses in our dreams at night, often present themselves as repetitions and refashionings of the scenes of infancy. Thus the dream façade may show us directly the true core of the dream, distorted through admixture with other matter.

Beyond these four activities there is nothing else to be discovered in the dream work. If we keep closely to the definition that dream work denotes the transference of dream thoughts to dream content, we are compelled to say that the dream work is not creative; it develops no fancies of its own, it

judges nothing, decides nothing. It does nothing but prepare the matter for condensation and displacement, and refashions it for dramatization, to which must be added the inconstant last-named mechanism—that of explanatory elaboration. It is true that a good deal is found in the dream content which might be understood as the result of another and more intellectual performance; but analysis shows conclusively every time that these *intellectual operations were already present in the dream thoughts, and have only been taken over by the dream content*. A syllogism in the dream is nothing other than the repetition of a syllogism in the dream thoughts; it seems inoffensive if it has been transferred to the dream without alteration; it becomes absurd if in the dream work it has been transferred to other matter. A calculation in the dream content simply means that there was a calculation in the dream thoughts; whilst this is always correct, the calculation in the dream can furnish the silliest results by the condensation of its factors and the displacement of the same operations to other things. Even speeches which are found in the dream content are not new compositions; they prove to be pieced together out of speeches which have been made or heard or read; the words are faithfully copied, but the occasion of their utterance is quite overlooked, and their meaning is most violently changed.

It is, perhaps, not superfluous to support these assertions by examples:

1. *A seemingly inoffensive, well-made dream of a patient. She was going to market with her cook, who carried the basket. The butcher said to her when she asked him for something: "That is all gone," and wished to give her something else, remarking; "That's very good." She declines, and goes to the greengrocer, who wants to sell her a peculiar vegetable which is bound up in bundles and of a black color. She says: "I don't know that; I won't take it."*

The remark "That is all gone" arose from the treatment. A few days before I said myself to the patient that the earliest reminiscences of childhood *are all gone* as such, but are replaced by transferences and dreams. Thus I am the butcher.

The second remark, "*I don't know that*" arose in a very different connection. The day before she had herself called out in rebuke to the cook (who,

moreover, also appears in the dream): "*Behave yourself properly*; I don't know *that*"—that is, "I don't know this kind of behavior; I won't have it." The more harmless portion of this speech was arrived at by a displacement of the dream content; in the dream thoughts only the other portion of the speech played a part, because the dream work changed an imaginary situation into utter irrecognizability and complete inoffensiveness (while in a certain sense I behave in an unseemly way to the lady). The situation resulting in this phantasy is, however, nothing but a new edition of one that actually took place.

2. A dream apparently meaningless relates to figures. "*She wants to pay something; her daughter takes three florins sixty-five kreuzers out of her purse; but she says: 'What are you doing? It only cost twenty-one kreuzers.'*"

The dreamer was a stranger who had placed her child at school in Vienna, and who was able to continue under my treatment so long as her daughter remained at Vienna. The day before the dream the directress of the school had recommended her to keep the child another year at school. In this case she would have been able to prolong her treatment by one year. The figures in the dream become important if it be remembered that time is money. One year equals 365 days, or, expressed in kreuzers, 365 kreuzers, which is three florins sixty-five kreuzers. The twenty-one kreuzers correspond with the three weeks which remained from the day of the dream to the end of the school term, and thus to the end of the treatment. It was obviously financial considerations which had moved the lady to refuse the proposal of the directress, and which were answerable for the triviality of the amount in the dream.

3. A lady, young, but already ten years married, heard that a friend of hers, Miss Elise L____, of about the same age, had become engaged. This gave rise to the following dream:

She was sitting with her husband in the theater; the one side of the stalls was quite empty. Her husband tells her, Elise L____ and her fiancé had intended coming, but could only get some cheap seats, three for one florin fifty kreuzers, and these they would not take. In her opinion, that would not have mattered very much.

The origin of the figures from the matter of the dream thoughts and the changes the figures underwent are of interest. Whence came the one florin fifty kreuzers? From a trifling occurrence of the previous day. Her sister-in-law had received 150 florins as a present from her husband, and had quickly got rid of it by buying some ornament. Note that 150 florins is one hundred times one florin fifty kreuzers. For the *three* concerned with the tickets, the only link is that Elise L_____ is exactly three months younger than the dreamer. The scene in the dream is the repetition of a little adventure for which she has often been teased by her husband. She was once in a great hurry to get tickets in time for a piece, and when she came to the theater *one side of the stalls was almost empty*. It was therefore quite unnecessary for her to have been in *such a hurry*. Nor must we overlook the absurdity of the dream that two persons should take three tickets for the theater.

Now for the dream ideas. It was *stupid* to have married so early; I *need not* have been *in so great a hurry*. Elise L_____ 's example shows me that I should have been able to get a husband later; indeed, one a *hundred times better* if I had but waited. I could have bought *three* such men with the money (dowry).

[Footnote 1](#): "Ich möchte gerne etwas geniessen ohne 'Kosten' zu haben." A pun upon the word "kosten," which has two meanings—"taste" and "cost." In "Die Traumdeutung," third edition, p. 71 footnote, Professor Freud remarks that "the finest example of dream interpretation left us by the ancients is based upon a pun" (from "The Interpretation of Dreams," by Artemidorus Daldianus). "Moreover, dreams are so intimately bound up with language that Ferenczi truly points out that every tongue has its own language of dreams. A dream is as a rule untranslatable into other languages."—TRANSLATOR.

[Footnote 2](#): It is worthy of remark that eminent philologists maintain that the oldest languages used the same word for expressing quite general antitheses. In C. Abel's essay, "Ueber den Gegensinn der Urwörter" (1884, the following examples of such words in England are given: "gleam—gloom"; "to lock—loch"; "down—The Downs"; "to step—to stop." In his essay on "The Origin of Language" ("Linguistic Essays," p. 240), Abel says: "When the Englishman says 'without,' is not his judgment based upon the comparative juxtaposition of two opposites, 'with' and 'out'; 'with' itself originally meant 'without,' as may still be seen in 'withdraw.' 'Bid' includes the opposite sense of giving and of proffering." Abel, "The English Verbs of Command," "Linguistic Essays," p. 104; see also Freud, "Ueber den Gegensinn der Urwörter"; *Jahrbuch für Psychoanalytische und Psychopathologische Forschungen*, Band II., part i., p. 179).—TRANSLATOR.

III

WHY THE DREAM DISGUISES THE DESIRES

In the foregoing exposition we have now learnt something of the dream work; we must regard it as a quite special psychical process, which, so far as we are aware, resembles nothing else. To the dream work has been transferred that bewilderment which its product, the dream, has aroused in us. In truth, the dream work is only the first recognition of a group of psychical processes to which must be referred the origin of hysterical symptoms, the ideas of morbid dread, obsession, and illusion. Condensation, and especially displacement, are never-failing features in these other processes. The regard for appearance remains, on the other hand, peculiar to the dream work. If this explanation brings the dream into line with the formation of psychical disease, it becomes the more important to fathom the essential conditions of processes like dream building. It will be probably a surprise to hear that neither the state of sleep nor illness is among the indispensable conditions. A whole number of phenomena of the everyday life of healthy persons, forgetfulness, slips in speaking and in holding things, together with a certain class of mistakes, are due to a psychical mechanism analogous to that of the dream and the other members of this group.

Displacement is the core of the problem, and the most striking of all the dream performances. A thorough investigation of the subject shows that the essential condition of displacement is purely psychological; it is in the nature of a motive. We get on the track by thrashing out experiences which one cannot avoid in the analysis of dreams. I had to break off the relations of my dream thoughts in the analysis of my dream on [p. 8](#) because I found some experiences which I do not wish strangers to know, and which I could not relate without serious damage to important considerations. I added, it would be no use were I to select another instead of that particular dream; in every dream where the content is obscure or intricate, I should hit upon dream thoughts which call for secrecy. If, however, I continue the analysis for myself, without regard to those others, for whom, indeed, so personal an

event as my dream cannot matter, I arrive finally at ideas which surprise me, which I have not known to be mine, which not only appear *foreign* to me, but which are *unpleasant*, and which I would like to oppose vehemently, whilst the chain of ideas running through the analysis intrudes upon me inexorably. I can only take these circumstances into account by admitting that these thoughts are actually part of my psychical life, possessing a certain psychical intensity or energy. However, by virtue of a particular psychological condition, the *thoughts could not become conscious to me*. I call this particular condition "*Repression*." It is therefore impossible for me not to recognize some casual relationship between the obscurity of the dream content and this state of repression—this *incapacity of consciousness*. Whence I conclude that the cause of the obscurity is *the desire to conceal these thoughts*. Thus I arrive at the conception of the *dream distortion* as the deed of the dream work, and of *displacement* serving to disguise this object.

I will test this in my own dream, and ask myself, What is the thought which, quite innocuous in its distorted form, provokes my liveliest opposition in its real form? I remember that the free drive reminded me of the last expensive drive with a member of my family, the interpretation of the dream being: I should for once like to experience affection for which I should not have to pay, and that shortly before the dream I had to make a heavy disbursement for this very person. In this connection, I cannot get away from the thought *that I regret this disbursement*. It is only when I acknowledge this feeling that there is any sense in my wishing in the dream for an affection that should entail no outlay. And yet I can state on my honor that I did not hesitate for a moment when it became necessary to expend that sum. The regret, the counter-current, was unconscious to me. Why it was unconscious is quite another question which would lead us far away from the answer which, though within my knowledge, belongs elsewhere.

If I subject the dream of another person instead of one of my own to analysis, the result is the same; the motives for convincing others is, however, changed. In the dream of a healthy person the only way for me to enable him to accept this repressed idea is the coherence of the dream thoughts. He is at liberty to reject this explanation. But if we are dealing

with a person suffering from any neurosis—say from hysteria—the recognition of these repressed ideas is compulsory by reason of their connection with the symptoms of his illness and of the improvement resulting from exchanging the symptoms for the repressed ideas. Take the patient from whom I got the last dream about the three tickets for one florin fifty kreuzers. Analysis shows that she does not think highly of her husband, that she regrets having married him, that she would be glad to change him for some one else. It is true that she maintains that she loves her husband, that her emotional life knows nothing about this depreciation (a hundred times better!), but all her symptoms lead to the same conclusion as this dream. When her repressed memories had reawakened a certain period when she was conscious that she did not love her husband, her symptoms disappeared, and therewith disappeared her resistance to the interpretation of the dream.

This conception of repression once fixed, together with the distortion of the dream in relation to repressed psychical matter, we are in a position to give a general exposition of the principal results which the analysis of dreams supplies. We learnt that the most intelligible and meaningful dreams are unrealized desires; the desires they pictured as realized are known to consciousness, have been held over from the daytime, and are of absorbing interest. The analysis of obscure and intricate dreams discloses something very similar; the dream scene again pictures as realized some desire which regularly proceeds from the dream ideas, but the picture is unrecognizable, and is only cleared up in the analysis. The desire itself is either one repressed, foreign to consciousness, or it is closely bound up with repressed ideas. The formula for these dreams may be thus stated: *They are concealed realizations of repressed desires*. It is interesting to note that they are right who regard the dream as foretelling the future. Although the future which the dream shows us is not that which will occur, but that which we would like to occur. Folk psychology proceeds here according to its wont; it believes what it wishes to believe.

Dreams can be divided into three classes according to their relation towards the realization of desire. Firstly come those which exhibit a *non-repressed, non-concealed desire*; these are dreams of the infantile type, becoming ever rarer among adults. Secondly, dreams which express in *veiled* form some

repressed desire; these constitute by far the larger number of our dreams, and they require analysis for their understanding. Thirdly, these dreams where repression exists, but *without* or with but slight concealment. These dreams are invariably accompanied by a feeling of dread which brings the dream to an end. This feeling of dread here replaces dream displacement; I regarded the dream work as having prevented this in the dream of the second class. It is not very difficult to prove that what is now present as intense dread in the dream was once desire, and is now secondary to the repression.

There are also definite dreams with a painful content, without the presence of any anxiety in the dream. These cannot be reckoned among dreams of dread; they have, however, always been used to prove the unimportance and the psychical futility of dreams. An analysis of such an example will show that it belongs to our second class of dreams—a *perfectly concealed* realization of repressed desires. Analysis will demonstrate at the same time how excellently adapted is the work of displacement to the concealment of desires.

A girl dreamt that she saw lying dead before her the only surviving child of her sister amid the same surroundings as a few years before she saw the first child lying dead. She was not sensible of any pain, but naturally combatted the view that the scene represented a desire of hers. Nor was that view necessary. Years ago it was at the funeral of the child that she had last seen and spoken to the man she loved. Were the second child to die, she would be sure to meet this man again in her sister's house. She is longing to meet him, but struggles against this feeling. The day of the dream she had taken a ticket for a lecture, which announced the presence of the man she always loved. The dream is simply a dream of impatience common to those which happen before a journey, theater, or simply anticipated pleasures. The longing is concealed by the shifting of the scene to the occasion when any joyous feeling were out of place, and yet where it did once exist. Note, further, that the emotional behavior in the dream is adapted, not to the displaced, but to the real but suppressed dream ideas. The scene anticipates the long-hoped-for meeting; there is here no call for painful emotions.

There has hitherto been no occasion for philosophers to bestir themselves with a psychology of repression. We must be allowed to construct some clear conception as to the origin of dreams as the first steps in this unknown territory. The scheme which we have formulated not only from a study of dreams is, it is true, already somewhat complicated, but we cannot find any simpler one that will suffice. We hold that our psychical apparatus contains two procedures for the construction of thoughts. The second one has the advantage that its products find an open path to consciousness, whilst the activity of the first procedure is unknown to itself, and can only arrive at consciousness through the second one. At the borderland of these two procedures, where the first passes over into the second, a censorship is established which only passes what pleases it, keeping back everything else. That which is rejected by the censorship is, according to our definition, in a state of repression. Under certain conditions, one of which is the sleeping state, the balance of power between the two procedures is so changed that what is repressed can no longer be kept back. In the sleeping state this may possibly occur through the negligence of the censor; what has been hitherto repressed will now succeed in finding its way to consciousness. But as the censorship is never absent, but merely off guard, certain alterations must be conceded so as to placate it. It is a compromise which becomes conscious in this case—a compromise between what one procedure has in view and the demands of the other. *Repression, laxity of the censor, compromise*—this is the foundation for the origin of many another psychological process, just as it is for the dream. In such compromises we can observe the processes of condensation, of displacement, the acceptance of superficial associations, which we have found in the dream work.

It is not for us to deny the demonic element which has played a part in constructing our explanation of dream work. The impression left is that the formation of obscure dreams proceeds as if a person had something to say which must be agreeable for another person upon whom he is dependent to hear. It is by the use of this image that we figure to ourselves the conception of the *dream distortion* and of the censorship, and ventured to crystallize our impression in a rather crude, but at least definite, psychological theory. Whatever explanation the future may offer of these first and second procedures, we shall expect a confirmation of our correlate that the second

procedure commands the entrance to consciousness, and can exclude the first from consciousness.

Once the sleeping state overcome, the censorship resumes complete sway, and is now able to revoke that which was granted in a moment of weakness. That the *forgetting* of dreams explains this in part, at least, we are convinced by our experience, confirmed again and again. During the relation of a dream, or during analysis of one, it not infrequently happens that some fragment of the dream is suddenly forgotten. This fragment so forgotten invariably contains the best and readiest approach to an understanding of the dream. Probably that is why it sinks into oblivion—*i.e.*, into a renewed suppression.

Viewing the dream content as the representation of a realized desire, and referring its vagueness to the changes made by the censor in the repressed matter, it is no longer difficult to grasp the function of dreams. In fundamental contrast with those saws which assume that sleep is disturbed by dreams, we hold the *dream as the guardian of sleep*. So far as children's dreams are concerned, our view should find ready acceptance.

The sleeping state or the psychical change to sleep, whatsoever it be, is brought about by the child being sent to sleep or compelled thereto by fatigue, only assisted by the removal of all stimuli which might open other objects to the psychical apparatus. The means which serve to keep external stimuli distant are known; but what are the means we can employ to depress the internal psychical stimuli which frustrate sleep? Look at a mother getting her child to sleep. The child is full of beseeching; he wants another kiss; he wants to play yet awhile. His requirements are in part met, in part drastically put off till the following day. Clearly these desires and needs, which agitate him, are hindrances to sleep. Every one knows the charming story of the bad boy (Baldwin Groller's) who awoke at night bellowing out, "*I want the rhinoceros.*" A really good boy, instead of bellowing, would have *dreamt* that he was playing with the rhinoceros. Because the dream which realizes his desire is believed during sleep, it removes the desire and makes sleep possible. It cannot be denied that this belief accords with the dream image, because it is arrayed in the psychical appearance of

probability; the child is without the capacity which it will acquire later to distinguish hallucinations or phantasies from reality.

The adult has learnt this differentiation; he has also learnt the futility of desire, and by continuous practice manages to postpone his aspirations, until they can be granted in some roundabout method by a change in the external world. For this reason it is rare for him to have his wishes realized during sleep in the short psychical way. It is even possible that this never happens, and that everything which appears to us like a child's dream demands a much more elaborate explanation. Thus it is that for adults—for every sane person without exception—a differentiation of the psychical matter has been fashioned which the child knew not. A psychical procedure has been reached which, informed by the experience of life, exercises with jealous power a dominating and restraining influence upon psychical emotions; by its relation to consciousness, and by its spontaneous mobility, it is endowed with the greatest means of psychical power. A portion of the infantile emotions has been withheld from this procedure as useless to life, and all the thoughts which flow from these are found in the state of repression.

Whilst the procedure in which we recognize our normal ego reposes upon the desire for sleep, it appears compelled by the psycho-physiological conditions of sleep to abandon some of the energy with which it was wont during the day to keep down what was repressed. This neglect is really harmless; however much the emotions of the child's spirit may be stirred, they find the approach to consciousness rendered difficult, and that to movement blocked in consequence of the state of sleep. The danger of their disturbing sleep must, however, be avoided. Moreover, we must admit that even in deep sleep some amount of free attention is exerted as a protection against sense-stimuli which might, perchance, make an awakening seem wiser than the continuance of sleep. Otherwise we could not explain the fact of our being always awakened by stimuli of certain quality. As the old physiologist Burdach pointed out, the mother is awakened by the whimpering of her child, the miller by the cessation of his mill, most people by gently calling out their names. This attention, thus on the alert, makes use of the internal stimuli arising from repressed desires, and fuses them into the dream, which as a compromise satisfies both procedures at the

same time. The dream creates a form of psychical release for the wish which is either suppressed or formed by the aid of repression, inasmuch as it presents it as realized. The other procedure is also satisfied, since the continuance of the sleep is assured. Our ego here gladly behaves like a child; it makes the dream pictures believable, saying, as it were, "Quite right, but let me sleep." The contempt which, once awakened, we bear the dream, and which rests upon the absurdity and apparent illogicality of the dream, is probably nothing but the reasoning of our sleeping ego on the feelings about what was repressed; with greater right it should rest upon the incompetency of this disturber of our sleep. In sleep we are now and then aware of this contempt; the dream content transcends the censorship rather too much, we think, "It's only a dream," and sleep on.

It is no objection to this view if there are borderlines for the dream where its function, to preserve sleep from interruption, can no longer be maintained—as in the dreams of impending dread. It is here changed for another function—to suspend the sleep at the proper time. It acts like a conscientious night-watchman, who first does his duty by quelling disturbances so as not to waken the citizen, but equally does his duty quite properly when he awakens the street should the causes of the trouble seem to him serious and himself unable to cope with them alone.

This function of dreams becomes especially well marked when there arises some incentive for the sense perception. That the senses aroused during sleep influence the dream is well known, and can be experimentally verified; it is one of the certain but much overestimated results of the medical investigation of dreams. Hitherto there has been an insoluble riddle connected with this discovery. The stimulus to the sense by which the investigator affects the sleeper is not properly recognized in the dream, but is intermingled with a number of indefinite interpretations, whose determination appears left to psychical free-will. There is, of course, no such psychical free-will. To an external sense-stimulus the sleeper can react in many ways. Either he awakens or he succeeds in sleeping on. In the latter case he can make use of the dream to dismiss the external stimulus, and this, again, in more ways than one. For instance, he can stay the stimulus by dreaming of a scene which is absolutely intolerable to him. This was the means used by one who was troubled by a painful perineal abscess. He

dreamt that he was on horseback, and made use of the poultice, which was intended to alleviate his pain, as a saddle, and thus got away from the cause of the trouble. Or, as is more frequently the case, the external stimulus undergoes a new rendering, which leads him to connect it with a repressed desire seeking its realization, and robs him of its reality, and is treated as if it were a part of the psychical matter. Thus, some one dreamt that he had written a comedy which embodied a definite *motif*; it was being performed; the first act was over amid enthusiastic applause; there was great clapping. At this moment the dreamer must have succeeded in prolonging his sleep despite the disturbance, for when he woke he no longer heard the noise; he concluded rightly that some one must have been beating a carpet or bed. The dreams which come with a loud noise just before waking have all attempted to cover the stimulus to waking by some other explanation, and thus to prolong the sleep for a little while.

Whosoever has firmly accepted this *ensorship* as the chief motive for the distortion of dreams will not be surprised to learn as the result of dream interpretation that most of the dreams of adults are traced by analysis to erotic desires. This assertion is not drawn from dreams obviously of a sexual nature, which are known to all dreamers from their own experience, and are the only ones usually described as "sexual dreams." These dreams are ever sufficiently mysterious by reason of the choice of persons who are made the objects of sex, the removal of all the barriers which cry halt to the dreamer's sexual needs in his waking state, the many strange reminders as to details of what are called perversions. But analysis discovers that, in many other dreams in whose manifest content nothing erotic can be found, the work of interpretation shows them up as, in reality, realization of sexual desires; whilst, on the other hand, that much of the thought-making when awake, the thoughts saved us as surplus from the day only, reaches presentation in dreams with the help of repressed erotic desires.

Towards the explanation of this statement, which is no theoretical postulate, it must be remembered that no other class of instincts has required so vast a suppression at the behest of civilization as the sexual, whilst their mastery by the highest psychical processes are in most persons soonest of all relinquished. Since we have learnt to understand *infantile sexuality*, often so vague in its expression, so invariably overlooked and misunderstood, we

are justified in saying that nearly every civilized person has retained at some point or other the infantile type of sex life; thus we understand that repressed infantile sex desires furnish the most frequent and most powerful impulses for the formation of dreams.¹

If the dream, which is the expression of some erotic desire, succeeds in making its manifest content appear innocently asexual, it is only possible in one way. The matter of these sexual presentations cannot be exhibited as such, but must be replaced by allusions, suggestions, and similar indirect means; differing from other cases of indirect presentation, those used in dreams must be deprived of direct understanding. The means of presentation which answer these requirements are commonly termed "symbols." A special interest has been directed towards these, since it has been observed that the dreamers of the same language use the like symbols—indeed, that in certain cases community of symbol is greater than community of speech. Since the dreamers do not themselves know the meaning of the symbols they use, it remains a puzzle whence arises their relationship with what they replace and denote. The fact itself is undoubted, and becomes of importance for the technique of the interpretation of dreams, since by the aid of a knowledge of this symbolism it is possible to understand the meaning of the elements of a dream, or parts of a dream, occasionally even the whole dream itself, without having to question the dreamer as to his own ideas. We thus come near to the popular idea of an interpretation of dreams, and, on the other hand, possess again the technique of the ancients, among whom the interpretation of dreams was identical with their explanation through symbolism.

Though the study of dream symbolism is far removed from finality, we now possess a series of general statements and of particular observations which are quite certain. There are symbols which practically always have the same meaning: Emperor and Empress (King and Queen) always mean the parents; room, a woman², and so on. The sexes are represented by a great variety of symbols, many of which would be at first quite incomprehensible had not the clues to the meaning been often obtained through other channels.

There are symbols of universal circulation, found in all dreamers, of one range of speech and culture; there are others of the narrowest individual significance which an individual has built up out of his own material. In the first class those can be differentiated whose claim can be at once recognized by the replacement of sexual things in common speech (those, for instance, arising from agriculture, as reproduction, seed) from others whose sexual references appear to reach back to the earliest times and to the obscurest depths of our image-building. The power of building symbols in both these special forms of symbols has not died out. Recently discovered things, like the airship, are at once brought into universal use as sex symbols.

It would be quite an error to suppose that a profounder knowledge of dream symbolism (the "Language of Dreams") would make us independent of questioning the dreamer regarding his impressions about the dream, and would give us back the whole technique of ancient dream interpreters. Apart from individual symbols and the variations in the use of what is general, one never knows whether an element in the dream is to be understood symbolically or in its proper meaning; the whole content of the dream is certainly not to be interpreted symbolically. The knowledge of dream symbols will only help us in understanding portions of the dream content, and does not render the use of the technical rules previously given at all superfluous. But it must be of the greatest service in interpreting a dream just when the impressions of the dreamer are withheld or are insufficient.

Dream symbolism proves also indispensable for understanding the so-called "typical" dreams and the dreams that "repeat themselves." Dream symbolism leads us far beyond the dream; it does not belong only to dreams, but is likewise dominant in legend, myth, and saga, in wit and in folklore. It compels us to pursue the inner meaning of the dream in these productions. But we must acknowledge that symbolism is not a result of the dream work, but is a peculiarity probably of our unconscious thinking, which furnishes to the dream work the matter for condensation, displacement, and dramatization.

[Footnote 1](#): Freud, "Three Contributions to Sexual Theory," translated by A.A. Brill (*Journal of Nervous and Mental Disease* Publishing Company, New York).

[Footnote 2](#): The words from "and" to "channels" in the next sentence is a short summary of the passage in the original. As this book will be read by other than professional people the passage has not been translated, in deference to English opinion.—TRANSLATOR.

IV

DREAM ANALYSIS

Perhaps we shall now begin to suspect that dream interpretation is capable of giving us hints about the structure of our psychic apparatus which we have thus far expected in vain from philosophy. We shall not, however, follow this track, but return to our original problem as soon as we have cleared up the subject of dream-disfigurement. The question has arisen how dreams with disagreeable content can be analyzed as the fulfillment of wishes. We see now that this is possible in case dream-disfigurement has taken place, in case the disagreeable content serves only as a disguise for what is wished. Keeping in mind our assumptions in regard to the two psychic instances, we may now proceed to say: disagreeable dreams, as a matter of fact, contain something which is disagreeable to the second instance, but which at the same time fulfills a wish of the first instance. They are wish dreams in the sense that every dream originates in the first instance, while the second instance acts towards the dream only in repelling, not in a creative manner. If we limit ourselves to a consideration of what the second instance contributes to the dream, we can never understand the dream. If we do so, all the riddles which the authors have found in the dream remain unsolved.

That the dream actually has a secret meaning, which turns out to be the fulfillment of a wish, must be proved afresh for every case by means of an analysis. I therefore select several dreams which have painful contents and attempt an analysis of them. They are partly dreams of hysterical subjects, which require long preliminary statements, and now and then also an examination of the psychic processes which occur in hysteria. I cannot, however, avoid this added difficulty in the exposition.

When I give a psychoneurotic patient analytical treatment, dreams are always, as I have said, the subject of our discussion. It must, therefore, give him all the psychological explanations through whose aid I myself have come to an understanding of his symptoms, and here I undergo an

unsparing criticism, which is perhaps not less keen than that I must expect from my colleagues. Contradiction of the thesis that all dreams are the fulfillments of wishes is raised by my patients with perfect regularity. Here are several examples of the dream material which is offered me to refute this position.

"You always tell me that the dream is a wish fulfilled," begins a clever lady patient. "Now I shall tell you a dream in which the content is quite the opposite, in which a wish of mine is *not* fulfilled. How do you reconcile that with your theory? The dream is as follows:—

"I want to give a supper, but having nothing at hand except some smoked salmon, I think of going marketing, but I remember that it is Sunday afternoon, when all the shops are closed. I next try to telephone to some caterers, but the telephone is out of order... Thus I must resign my wish to give a supper."

I answer, of course, that only the analysis can decide the meaning of this dream, although I admit that at first sight it seems sensible and coherent, and looks like the opposite of a wish-fulfillment. "But what occurrence has given rise to this dream?" I ask. "You know that the stimulus for a dream always lies among the experiences of the preceding day."

Analysis.—The husband of the patient, an upright and conscientious wholesale butcher, had told her the day before that he is growing too fat, and that he must, therefore, begin treatment for obesity. He was going to get up early, take exercise, keep to a strict diet, and above all accept no more invitations to suppers. She proceeds laughingly to relate how her husband at an inn table had made the acquaintance of an artist, who insisted upon painting his portrait because he, the painter, had never found such an expressive head. But her husband had answered in his rough way, that he was very thankful for the honor, but that he was quite convinced that a portion of the backside of a pretty young girl would please the artist better than his whole face¹. She said that she was at the time very much in love with her husband, and teased him a good deal. She had also asked him not to send her any caviare. What does that mean?

As a matter of fact, she had wanted for a long time to eat a caviare sandwich every forenoon, but had grudged herself the expense. Of course, she would at once get the caviare from her husband, as soon as she asked him for it. But she had begged him, on the contrary, not to send her the caviare, in order that she might tease him about it longer.

This explanation seems far-fetched to me. Unadmitted motives are in the habit of hiding behind such unsatisfactory explanations. We are reminded of subjects hypnotized by Bernheim, who carried out a posthypnotic order, and who, upon being asked for their motives, instead of answering: "I do not know why I did that," had to invent a reason that was obviously inadequate. Something similar is probably the case with the caviare of my patient. I see that she is compelled to create an unfulfilled wish in life. Her dream also shows the reproduction of the wish as accomplished. But why does she need an unfulfilled wish?

The ideas so far produced are insufficient for the interpretation of the dream. I beg for more. After a short pause, which corresponds to the overcoming of a resistance, she reports further that the day before she had made a visit to a friend, of whom she is really jealous, because her husband is always praising this woman so much. Fortunately, this friend is very lean and thin, and her husband likes well-rounded figures. Now of what did this lean friend speak? Naturally of her wish to become somewhat stouter. She also asked my patient: "When are you going to invite us again? You always have such a good table."

Now the meaning of the dream is clear. I may say to the patient: "It is just as though you had thought at the time of the request: 'Of course, I'll invite you, so you can eat yourself fat at my house and become still more pleasing to my husband. I would rather give no more suppers.' The dream then tells you that you cannot give a supper, thereby fulfilling your wish not to contribute anything to the rounding out of your friend's figure. The resolution of your husband to refuse invitations to supper for the sake of getting thin teaches you that one grows fat on the things served in company." Now only some conversation is necessary to confirm the solution. The smoked salmon in the dream has not yet been traced. "How did the salmon mentioned in the dream occur to you?" "Smoked salmon is

the favorite dish of this friend," she answered. I happen to know the lady, and may corroborate this by saying that she grudges herself the salmon just as much as my patient grudges herself the caviare.

The dream admits of still another and more exact interpretation, which is necessitated only by a subordinate circumstance. The two interpretations do not contradict one another, but rather cover each other and furnish a neat example of the usual ambiguity of dreams as well as of all other psychopathological formations. We have seen that at the same time that she dreams of the denial of the wish, the patient is in reality occupied in securing an unfulfilled wish (the caviare sandwiches). Her friend, too, had expressed a wish, namely, to get fatter, and it would not surprise us if our lady had dreamt that the wish of the friend was not being fulfilled. For it is her own wish that a wish of her friend's—for increase in weight—should not be fulfilled. Instead of this, however, she dreams that one of her own wishes is not fulfilled. The dream becomes capable of a new interpretation, if in the dream she does not intend herself, but her friend, if she has put herself in the place of her friend, or, as we may say, has identified herself with her friend.

I think she has actually done this, and as a sign of this identification she has created an unfulfilled wish in reality. But what is the meaning of this hysterical identification? To clear this up a thorough exposition is necessary. Identification is a highly important factor in the mechanism of hysterical symptoms; by this means patients are enabled in their symptoms to represent not merely their own experiences, but the experiences of a great number of other persons, and can suffer, as it were, for a whole mass of people, and fill all the parts of a drama by means of their own personalities alone. It will here be objected that this is well-known hysterical imitation, the ability of hysteric subjects to copy all the symptoms which impress them when they occur in others, as though their pity were stimulated to the point of reproduction. But this only indicates the way in which the psychic process is discharged in hysterical imitation; the way in which a psychic act proceeds and the act itself are two different things. The latter is slightly more complicated than one is apt to imagine the imitation of hysterical subjects to be: it corresponds to an unconscious concluded process, as an example will show. The physician who has a female patient with a

particular kind of twitching, lodged in the company of other patients in the same room of the hospital, is not surprised when some morning he learns that this peculiar hysterical attack has found imitations. He simply says to himself: The others have seen her and have done likewise: that is psychic infection. Yes, but psychic infection proceeds in somewhat the following manner: As a rule, patients know more about one another than the physician knows about each of them, and they are concerned about each other when the visit of the doctor is over. Some of them have an attack to-day: soon it is known among the rest that a letter from home, a return of lovesickness or the like, is the cause of it. Their sympathy is aroused, and the following syllogism, which does not reach consciousness, is completed in them: "If it is possible to have this kind of an attack from such causes, I too may have this kind of an attack, for I have the same reasons." If this were a cycle capable of becoming conscious, it would perhaps express itself in *fear* of getting the same attack; but it takes place in another psychic sphere, and, therefore, ends in the realization of the dreaded symptom. Identification is therefore not a simple imitation, but a sympathy based upon the same etiological claim; it expresses an "as though," and refers to some common quality which has remained in the unconscious.

Identification is most often used in hysteria to express sexual community. An hysterical woman identifies herself most readily—although not exclusively—with persons with whom she has had sexual relations, or who have sexual intercourse with the same persons as herself. Language takes such a conception into consideration: two lovers are "one." In the hysterical phantasy, as well as in the dream, it is sufficient for the identification if one thinks of sexual relations, whether or not they become real. The patient, then, only follows the rules of the hysterical thought processes when she gives expression to her jealousy of her friend (which, moreover, she herself admits to be unjustified, in that she puts herself in her place and identifies herself with her by creating a symptom—the denied wish). I might further clarify the process specifically as follows: She puts herself in the place of her friend in the dream, because her friend has taken her own place relation to her husband, and because she would like to take her friend's place in the esteem of her husband².

The contradiction to my theory of dreams in the case of another female patient, the most witty among all my dreamers, was solved in a simpler manner, although according to the scheme that the non-fulfillment of one wish signifies the fulfillment of another. I had one day explained to her that the dream is a wish of fulfillment. The next day she brought me a dream to the effect that she was traveling with her mother-in-law to their common summer resort. Now I knew that she had struggled violently against spending the summer in the neighborhood of her mother-in-law. I also knew that she had luckily avoided her mother-in-law by renting an estate in a far-distant country resort. Now the dream reversed this wished-for solution; was not this in the flattest contradiction to my theory of wish-fulfillment in the dream? Certainly, it was only necessary to draw the inferences from this dream in order to get at its interpretation. According to this dream, I was in the wrong. *It was thus her wish that I should be in the wrong, and this wish the dream showed her as fulfilled.* But the wish that I should be in the wrong, which was fulfilled in the theme of the country home, referred to a more serious matter. At that time I had made up my mind, from the material furnished by her analysis, that something of significance for her illness must have occurred at a certain time in her life. She had denied it because it was not present in her memory. We soon came to see that I was in the right. Her wish that I should be in the wrong, which is transformed into the dream, thus corresponded to the justifiable wish that those things, which at the time had only been suspected, had never occurred at all.

Without an analysis, and merely by means of an assumption, I took the liberty of interpreting a little occurrence in the case of a friend, who had been my colleague through the eight classes of the Gymnasium. He once heard a lecture of mine delivered to a small assemblage, on the novel subject of the dream as the fulfillment of a wish. He went home, dreamt *that he had lost all his suits*—he was a lawyer—and then complained to me about it. I took refuge in the evasion: "One can't win all one's suits," but I thought to myself: "If for eight years I sat as Primus on the first bench, while he moved around somewhere in the middle of the class, may he not naturally have had a wish from his boyhood days that I, too, might for once completely disgrace myself?"

In the same way another dream of a more gloomy character was offered me by a female patient as a contradiction to my theory of the wish-dream. The patient, a young girl, began as follows: "You remember that my sister has now only one boy, Charles: she lost the elder one, Otto, while I was still at her house. Otto was my favorite; it was I who really brought him up. I like the other little fellow, too, but of course not nearly as much as the dead one. Now I dreamt last night that *I saw Charles lying dead before me. He was lying in his little coffin, his hands folded: there were candles all about, and, in short, it was just like the time of little Otto's death, which shocked me so profoundly.* Now tell me, what does this mean? You know me: am I really bad enough to wish my sister to lose the only child she has left? Or does the dream mean that I wish Charles to be dead rather than Otto, whom I like so much better?"

I assured her that this interpretation was impossible. After some reflection I was able to give her the interpretation of the dream, which I subsequently made her confirm.

Having become an orphan at an early age, the girl had been brought up in the house of a much older sister, and had met among the friends and visitors who came to the house, a man who made a lasting impression upon her heart. It looked for a time as though these barely expressed relations were to end in marriage, but this happy culmination was frustrated by the sister, whose motives have never found a complete explanation. After the break, the man who was loved by our patient avoided the house: she herself became independent some time after little Otto's death, to whom her affection had now turned. But she did not succeed in freeing herself from the inclination for her sister's friend in which she had become involved. Her pride commanded her to avoid him; but it was impossible for her to transfer her love to the other suitors who presented themselves in order. Whenever the man whom she loved, who was a member of the literary profession, announced a lecture anywhere, she was sure to be found in the audience; she also seized every other opportunity to see him from a distance unobserved by him. I remembered that on the day before she had told me that the Professor was going to a certain concert, and that she was also going there, in order to enjoy the sight of him. This was on the day of the dream; and the concert was to take place on the day on which she told me

the dream. I could now easily see the correct interpretation, and I asked her whether she could think of any event which had happened after the death of little Otto. She answered immediately: "Certainly; at that time the Professor returned after a long absence, and I saw him once more beside the coffin of little Otto." It was exactly as I had expected. I interpreted the dream in the following manner: "If now the other boy were to die, the same thing would be repeated. You would spend the day with your sister, the Professor would surely come in order to offer condolence, and you would see him again under the same circumstances as at that time. The dream signifies nothing but this wish of yours to see him again, against which you are fighting inwardly. I know that you are carrying the ticket for to-day's concert in your bag. Your dream is a dream of impatience; it has anticipated the meeting which is to take place to-day by several hours."

In order to disguise her wish she had obviously selected a situation in which wishes of that sort are commonly suppressed—a situation which is so filled with sorrow that love is not thought of. And yet, it is very easily probable that even in the actual situation at the bier of the second, more dearly loved boy, which the dream copied faithfully, she had not been able to suppress her feelings of affection for the visitor whom she had missed for so long a time.

A different explanation was found in the case of a similar dream of another female patient, who was distinguished in her earlier years by her quick wit and her cheerful demeanors and who still showed these qualities at least in the notion, which occurred to her in the course of treatment. In connection with a longer dream, it seemed to this lady that she saw her fifteen-year-old daughter lying dead before her in a box. She was strongly inclined to convert this dream-image into an objection to the theory of wish-fulfillment, but herself suspected that the detail of the box must lead to a different conception of the dream.³ In the course of the analysis it occurred to her that on the evening before, the conversation of the company had turned upon the English word "box," and upon the numerous translations of it into German, such as box, theater box, chest, box on the ear, &c. From other components of the same dream it is now possible to add that the lady had guessed the relationship between the English word "box" and the German *Büchse*, and had then been haunted by the memory that *Büchse* (as

well as "box") is used in vulgar speech to designate the female genital organ. It was therefore possible, making a certain allowance for her notions on the subject of topographical anatomy, to assume that the child in the box signified a child in the womb of the mother. At this stage of the explanation she no longer denied that the picture of the dream really corresponded to one of her wishes. Like so many other young women, she was by no means happy when she became pregnant, and admitted to me more than once the wish that her child might die before its birth; in a fit of anger following a violent scene with her husband she had even struck her abdomen with her fists in order to hit the child within. The dead child was, therefore, really the fulfillment of a wish, but a wish which had been put aside for fifteen years, and it is not surprising that the fulfillment of the wish was no longer recognized after so long an interval. For there had been many changes meanwhile.

The group of dreams to which the two last mentioned belong, having as content the death of beloved relatives, will be considered again under the head of "Typical Dreams." I shall there be able to show by new examples that in spite of their undesirable content, all these dreams must be interpreted as wish-fulfillments. For the following dream, which again was told me in order to deter me from a hasty generalization of the theory of wishing in dreams, I am indebted, not to a patient, but to an intelligent jurist of my acquaintance. "*I dream,*" my informant tells me, "*that I am walking in front of my house with a lady on my arm. Here a closed wagon is waiting, a gentleman steps up to me, gives his authority as an agent of the police, and demands that I should follow him. I only ask for time in which to arrange my affairs.* Can you possibly suppose this is a wish of mine to be arrested?" "Of course not," I must admit. "Do you happen to know upon what charge you were arrested?" "Yes; I believe for infanticide." "Infanticide? But you know that only a mother can commit this crime upon her newly born child?" "That is true."⁴ "And under what circumstances did you dream; what happened on the evening before?" "I would rather not tell you that; it is a delicate matter." "But I must have it, otherwise we must forgo the interpretation of the dream." "Well, then, I will tell you. I spent the night, not at home, but at the house of a lady who means very much to me. When we awoke in the morning, something again passed between us. Then I went to sleep again, and dreamt what I have told you." "The woman

is married?" "Yes." "And you do not wish her to conceive a child?" "No; that might betray us." "Then you do not practice normal coitus?" "I take the precaution to withdraw before ejaculation." "Am I permitted to assume that you did this trick several times during the night, and that in the morning you were not quite sure whether you had succeeded?" "That might be the case." "Then your dream is the fulfillment of a wish. By means of it you secure the assurance that you have not begotten a child, or, what amounts to the same thing, that you have killed a child. I can easily demonstrate the connecting links. Do you remember, a few days ago we were talking about the distress of matrimony (Ehenot), and about the inconsistency of permitting the practice of coitus as long as no impregnation takes place, while every delinquency after the ovum and the semen meet and a foetus is formed is punished as a crime? In connection with this, we also recalled the mediæval controversy about the moment of time at which the soul is really lodged in the foetus, since the concept of murder becomes admissible only from that point on. Doubtless you also know the gruesome poem by Lenau, which puts infanticide and the prevention of children on the same plane." "Strangely enough, I had happened to think of Lenau during the afternoon." "Another echo of your dream. And now I shall demonstrate to you another subordinate wish-fulfillment in your dream. You walk in front of your house with the lady on your arm. So you take her home, instead of spending the night at her house, as you do in actuality. The fact that the wish-fulfillment, which is the essence of the dream, disguises itself in such an unpleasant form, has perhaps more than one reason. From my essay on the etiology of anxiety neuroses, you will see that I note interrupted coitus as one of the factors which cause the development of neurotic fear. It would be consistent with this that if after repeated cohabitation of the kind mentioned you should be left in an uncomfortable mood, which now becomes an element in the composition of your dream. You also make use of this unpleasant state of mind to conceal the wish-fulfillment. Furthermore, the mention of infanticide has not yet been explained. Why does this crime, which is peculiar to females, occur to you?" "I shall confess to you that I was involved in such an affair years ago. Through my fault a girl tried to protect herself from the consequences of a *liaison* with me by securing an abortion. I had nothing to do with carrying out the plan, but I was naturally for a long time worried lest the affair might be discovered." "I understand;

this recollection furnished a second reason why the supposition that you had done your trick badly must have been painful to you."

A young physician, who had heard this dream of my colleague when it was told, must have felt implicated by it, for he hastened to imitate it in a dream of his own, applying its mode of thinking to another subject. The day before he had handed in a declaration of his income, which was perfectly honest, because he had little to declare. He dreamt that an acquaintance of his came from a meeting of the tax commission and informed him that all the other declarations of income had passed uncontested, but that his own had awakened general suspicion, and that he would be punished with a heavy fine. The dream is a poorly-concealed fulfillment of the wish to be known as a physician with a large income. It likewise recalls the story of the young girl who was advised against accepting her suitor because he was a man of quick temper who would surely treat her to blows after they were married.

The answer of the girl was: "I wish he *would* strike me!" Her wish to be married is so strong that she takes into the bargain the discomfort which is said to be connected with matrimony, and which is predicted for her, and even raises it to a wish.

If I group the very frequently occurring dreams of this sort, which seem flatly to contradict my theory, in that they contain the denial of a wish or some occurrence decidedly unwished for, under the head of "counter wish-dreams," I observe that they may all be referred to two principles, of which one has not yet been mentioned, although it plays a large part in the dreams of human beings. One of the motives inspiring these dreams is the wish that I should appear in the wrong. These dreams regularly occur in the course of my treatment if the patient shows a resistance against me, and I can count with a large degree of certainty upon causing such a dream after I have once explained to the patient my theory that the dream is a wish-fulfillment.⁵ I may even expect this to be the case in a dream merely in order to fulfill the wish that I may appear in the wrong. The last dream which I shall tell from those occurring in the course of treatment again shows this very thing. A young girl who has struggled hard to continue my treatment, against the will of her relatives and the authorities whom she had consulted, dreams as follows: *She is forbidden at home to come to me any more. She then*

reminds me of the promise I made her to treat her for nothing if necessary, and I say to her: "I can show no consideration in money matters."

It is not at all easy in this case to demonstrate the fulfillment of a wish, but in all cases of this kind there is a second problem, the solution of which helps also to solve the first. Where does she get the words which she puts into my mouth? Of course I have never told her anything like that, but one of her brothers, the very one who has the greatest influence over her, has been kind enough to make this remark about me. It is then the purpose of the dream that this brother should remain in the right; and she does not try to justify this brother merely in the dream; it is her purpose in life and the motive for her being ill.

The other motive for counter wish-dreams is so clear that there is danger of overlooking it, as for some time happened in my own case. In the sexual make-up of many people there is a masochistic component, which has arisen through the conversion of the aggressive, sadistic component into its opposite. Such people are called "ideal" masochists, if they seek pleasure not in the bodily pain which may be inflicted upon them, but in humiliation and in chastisement of the soul. It is obvious that such persons can have counter wish-dreams and disagreeable dreams, which, however, for them are nothing but wish-fulfillment, affording satisfaction for their masochistic inclinations. Here is such a dream. A young man, who has in earlier years tormented his elder brother, towards whom he was homosexually inclined, but who had undergone a complete change of character, has the following dream, which consists of three parts: (1) *He is "insulted" by his brother.* (2) *Two adults are caressing each other with homosexual intentions.* (3) *His brother has sold the enterprise whose management the young man reserved for his own future.* He awakens from the last-mentioned dream with the most unpleasant feelings, and yet it is a masochistic wish-dream, which might be translated: It would serve me quite right if my brother were to make that sale against my interest, as a punishment for all the torments which he has suffered at my hands.

I hope that the above discussion and examples will suffice—until further objection can be raised—to make it seem credible that even dreams with a painful content are to be analyzed as the fulfillments of wishes. Nor will it

seem a matter of chance that in the course of interpretation one always happens upon subjects of which one does not like to speak or think. The disagreeable sensation which such dreams arouse is simply identical with the antipathy which endeavors—usually with success—to restrain us from the treatment or discussion of such subjects, and which must be overcome by all of us, if, in spite of its unpleasantness, we find it necessary to take the matter in hand. But this disagreeable sensation, which occurs also in dreams, does not preclude the existence of a wish; every one has wishes which he would not like to tell to others, which he does not want to admit even to himself. We are, on other grounds, justified in connecting the disagreeable character of all these dreams with the fact of dream disfigurement, and in concluding that these dreams are distorted, and that the wish-fulfillment in them is disguised until recognition is impossible for no other reason than that a repugnance, a will to suppress, exists in relation to the subject-matter of the dream or in relation to the wish which the dream creates. Dream disfigurement, then, turns out in reality to be an act of the censor. We shall take into consideration everything which the analysis of disagreeable dreams has brought to light if we reword our formula as follows: *The dream is the (disguised) fulfillment of a (suppressed, repressed) wish.*

Now there still remain as a particular species of dreams with painful content, dreams of anxiety, the inclusion of which under dreams of wishing will find least acceptance with the uninitiated. But I can settle the problem of anxiety dreams in very short order; for what they may reveal is not a new aspect of the dream problem; it is a question in their case of understanding neurotic anxiety in general. The fear which we experience in the dream is only seemingly explained by the dream content. If we subject the content of the dream to analysis, we become aware that the dream fear is no more justified by the dream content than the fear in a phobia is justified by the idea upon which the phobia depends. For example, it is true that it is possible to fall out of a window, and that some care must be exercised when one is near a window, but it is inexplicable why the anxiety in the corresponding phobia is so great, and why it follows its victims to an extent so much greater than is warranted by its origin. The same explanation, then, which applies to the phobia applies also to the dream of anxiety. In both

cases the anxiety is only superficially attached to the idea which accompanies it and comes from another source.

On account of the intimate relation of dream fear to neurotic fear, discussion of the former obliges me to refer to the latter. In a little essay on "The Anxiety Neurosis,"⁶ I maintained that neurotic fear has its origin in the sexual life, and corresponds to a libido which has been turned away from its object and has not succeeded in being applied. From this formula, which has since proved its validity more and more clearly, we may deduce the conclusion that the content of anxiety dreams is of a sexual nature, the libido belonging to which content has been transformed into fear.

[Footnote 1](#): To sit for the painter. Goethe: "And if he has no backside, how can the nobleman sit?"

[Footnote 2](#): I myself regret the introduction of such passages from the psychopathology of hysteria, which, because of their fragmentary representation and of being torn from all connection with the subject, cannot have a very enlightening influence. If these passages are capable of throwing light upon the intimate relations between the dream and the psychoneuroses, they have served the purpose for which I have taken them up.

[Footnote 3](#): Something like the smoked salmon in the dream of the deferred supper.

[Footnote 4](#): It often happens that a dream is told incompletely, and that a recollection of the omitted portions appear only in the course of the analysis. These portions subsequently fitted in, regularly furnish the key to the interpretation. *Cf.* below, about forgetting in dreams.

[Footnote 5](#): Similar "counter wish-dreams" have been repeatedly reported to me within the last few years by my pupils who thus reacted to their first encounter with the "wish theory of the dream."

[Footnote 6](#): See *Selected Papers on Hysteria and other Psychoneuroses*, p. 133, translated by A.A. Brill, *Journal of Nervous and Mental Diseases*, Monograph Series.

V

SEX IN DREAMS

The more one is occupied with the solution of dreams, the more willing one must become to acknowledge that the majority of the dreams of adults treat of sexual material and give expression to erotic wishes. Only one who really analyzes dreams, that is to say, who pushes forward from their manifest content to the latent dream thoughts, can form an opinion on this subject—never the person who is satisfied with registering the manifest content (as, for example, Näcke in his works on sexual dreams). Let us recognize at once that this fact is not to be wondered at, but that it is in complete harmony with the fundamental assumptions of dream explanation. No other impulse has had to undergo so much suppression from the time of childhood as the sex impulse in its numerous components, from no other impulse have survived so many and such intense unconscious wishes, which now act in the sleeping state in such a manner as to produce dreams. In dream interpretation, this significance of sexual complexes must never be forgotten, nor must they, of course, be exaggerated to the point of being considered exclusive.

Of many dreams it can be ascertained by a careful interpretation that they are even to be taken bisexually, inasmuch as they result in an irrefutable secondary interpretation in which they realize homosexual feelings—that is, feelings that are common to the normal sexual activity of the dreaming person. But that all dreams are to be interpreted bisexually, seems to me to be a generalization as indemonstrable as it is improbable, which I should not like to support. Above all I should not know how to dispose of the apparent fact that there are many dreams satisfying other than—in the widest sense—erotic needs, as dreams of hunger, thirst, convenience, &c. Likewise the similar assertions "that behind every dream one finds the death sentence" (Stekel), and that every dream shows "a continuation from the feminine to the masculine line" (Adler), seem to me to proceed far beyond what is admissible in the interpretation of dreams.

We have already asserted elsewhere that dreams which are conspicuously innocent invariably embody coarse erotic wishes, and we might confirm this by means of numerous fresh examples. But many dreams which appear indifferent, and which would never be suspected of any particular significance, can be traced back, after analysis, to unmistakably sexual wish-feelings, which are often of an unexpected nature. For example, who would suspect a sexual wish in the following dream until the interpretation had been worked out? The dreamer relates: *Between two stately palaces stands a little house, receding somewhat, whose doors are closed. My wife leads me a little way along the street up to the little house, and pushes in the door, and then I slip quickly and easily into the interior of a courtyard that slants obliquely upwards.*

Any one who has had experience in the translating of dreams will, of course, immediately perceive that penetrating into narrow spaces, and opening locked doors, belong to the commonest sexual symbolism, and will easily find in this dream a representation of attempted coition from behind (between the two stately buttocks of the female body). The narrow slanting passage is of course the vagina; the assistance attributed to the wife of the dreamer requires the interpretation that in reality it is only consideration for the wife which is responsible for the detention from such an attempt. Moreover, inquiry shows that on the previous day a young girl had entered the household of the dreamer who had pleased him, and who had given him the impression that she would not be altogether opposed to an approach of this sort. The little house between the two palaces is taken from a reminiscence of the Hradschin in Prague, and thus points again to the girl who is a native of that city.

If with my patients I emphasize the frequency of the Oedipus dream—of having sexual intercourse with one's mother—I get the answer: "I cannot remember such a dream." Immediately afterwards, however, there arises the recollection of another disguised and indifferent dream, which has been dreamed repeatedly by the patient, and the analysis shows it to be a dream of this same content—that is, another Oedipus dream. I can assure the reader that veiled dreams of sexual intercourse with the mother are a great deal more frequent than open ones to the same effect.

There are dreams about landscapes and localities in which emphasis is always laid upon the assurance: "I have been there before." In this case the locality is always the genital organ of the mother; it can indeed be asserted with such certainty of no other locality that one "has been there before."

A large number of dreams, often full of fear, which are concerned with passing through narrow spaces or with staying, in the water, are based upon fancies about the embryonic life, about the sojourn in the mother's womb, and about the act of birth. The following is the dream of a young man who in his fancy has already while in embryo taken advantage of his opportunity to spy upon an act of coition between his parents.

"He is in a deep shaft, in which there is a window, as in the Semmering Tunnel. At first he sees an empty landscape through this window, and then he composes a picture into it, which is immediately at hand and which fills out the empty space. The picture represents a field which is being thoroughly harrowed by an implement, and the delightful air, the accompanying idea of hard work, and the bluish-black clods of earth make a pleasant impression. He then goes on and sees a primary school opened ... and he is surprised that so much attention is devoted in it to the sexual feelings of the child, which makes him think of me."

Here is a pretty water-dream of a female patient, which was turned to extraordinary account in the course of treatment.

At her summer resort at the ... Lake, she hurls herself into the dark water at a place where the pale moon is reflected in the water.

Dreams of this sort are parturition dreams; their interpretation is accomplished by reversing the fact reported in the manifest dream content; thus, instead of "throwing one's self into the water," read "coming out of the water," that is, "being born." The place from which one is born is recognized if one thinks of the bad sense of the French "la lune." The pale moon thus becomes the white "bottom" (Popo), which the child soon recognizes as the place from which it came. Now what can be the meaning of the patient's wishing to be born at her summer resort? I asked the dreamer this, and she answered without hesitation: "Hasn't the treatment made me as though I were born again?" Thus the dream becomes an

invitation to continue the cure at this summer resort, that is, to visit her there; perhaps it also contains a very bashful allusion to the wish to become a mother herself.¹

Another dream of parturition, with its interpretation, I take from the work of E. Jones. *"She stood at the seashore watching a small boy, who seemed to be hers, wading into the water. This he did till the water covered him, and she could only see his head bobbing up and down near the surface. The scene then changed to the crowded hall of a hotel. Her husband left her, and she 'entered into conversation with' a stranger."* The second half of the dream was discovered in the analysis to represent a flight from her husband, and the entering into intimate relations with a third person, behind whom was plainly indicated Mr. X.'s brother mentioned in a former dream. The first part of the dream was a fairly evident birth phantasy. In dreams as in mythology, the delivery of a child *from* the uterine waters is commonly presented by distortion as the entry of the child *into* water; among many others, the births of Adonis, Osiris, Moses, and Bacchus are well-known illustrations of this. The bobbing up and down of the head in the water at once recalled to the patient the sensation of quickening she had experienced in her only pregnancy. Thinking of the boy going into the water induced a reverie in which she saw herself taking him out of the water, carrying him into the nursery, washing him and dressing him, and installing him in her household.

The second half of the dream, therefore, represents thoughts concerning the elopement, which belonged to the first half of the underlying latent content; the first half of the dream corresponded with the second half of the latent content, the birth phantasy. Besides this inversion in order, further inversions took place in each half of the dream. In the first half the child *entered* the water, and then his head bobbed; in the underlying dream thoughts first the quickening occurred, and then the child left the water (a double inversion). In the second half her husband left her; in the dream thoughts she left her husband.

Another parturition dream is related by Abraham of a young woman looking forward to her first confinement. From a place in the floor of the house a subterranean canal leads directly into the water (parturition path,

amniotic liquor). She lifts up a trap in the floor, and there immediately appears a creature dressed in a brownish fur, which almost resembles a seal. This creature changes into the younger brother of the dreamer, to whom she has always stood in maternal relationship.

Dreams of "saving" are connected with parturition dreams. To save, especially to save from the water, is equivalent to giving birth when dreamed by a woman; this sense is, however, modified when the dreamer is a man.

Robbers, burglars at night, and ghosts, of which we are afraid before going to bed, and which occasionally even disturb our sleep, originate in one and the same childish reminiscence. They are the nightly visitors who have awakened the child to set it on the chamber so that it may not wet the bed, or have lifted the cover in order to see clearly how the child is holding its hands while sleeping. I have been able to induce an exact recollection of the nocturnal visitor in the analysis of some of these anxiety dreams. The robbers were always the father, the ghosts more probably corresponded to feminine persons with white night-gowns.

When one has become familiar with the abundant use of symbolism for the representation of sexual material in dreams, one naturally raises the question whether there are not many of these symbols which appear once and for all with a firmly established significance like the signs in stenography; and one is tempted to compile a new dream-book according to the cipher method. In this connection it may be remarked that this symbolism does not belong peculiarly to the dream, but rather to unconscious thinking, particularly that of the masses, and it is to be found in greater perfection in the folklore, in the myths, legends, and manners of speech, in the proverbial sayings, and in the current witticisms of a nation than in its dreams.

The dream takes advantage of this symbolism in order to give a disguised representation to its latent thoughts. Among the symbols which are used in this manner there are of course many which regularly, or almost regularly, mean the same thing. Only it is necessary to keep in mind the curious plasticity of psychic material. Now and then a symbol in the dream content may have to be interpreted not symbolically, but according to its real

meaning; at another time the dreamer, owing to a peculiar set of recollections, may create for himself the right to use anything whatever as a sexual symbol, though it is not ordinarily used in that way. Nor are the most frequently used sexual symbols unambiguous every time.

After these limitations and reservations I may call attention to the following: Emperor and Empress (King and Queen) in most cases really represent the parents of the dreamer; the dreamer himself or herself is the prince or princess. All elongated objects, sticks, tree-trunks, and umbrellas (on account of the stretching-up which might be compared to an erection! all elongated and sharp weapons, knives, daggers, and pikes, are intended to represent the male member. A frequent, not very intelligible, symbol for the same is a nail-file (on account of the rubbing and scraping?). Little cases, boxes, caskets, closets, and stoves correspond to the female part. The symbolism of lock and key has been very gracefully employed by Uhland in his song about the "Grafen Eberstein," to make a common smutty joke. The dream of walking through a row of rooms is a brothel or harem dream. Staircases, ladders, and flights of stairs, or climbing on these, either upwards or downwards, are symbolic representations of the sexual act. Smooth walls over which one is climbing, façades of houses upon which one is letting oneself down, frequently under great anxiety, correspond to the erect human body, and probably repeat in the dream reminiscences of the upward climbing of little children on their parents or foster parents. "Smooth" walls are men. Often in a dream of anxiety one is holding on firmly to some projection from a house. Tables, set tables, and boards are women, perhaps on account of the opposition which does away with the bodily contours. Since "bed and board" (*mensa et thorus*) constitute marriage, the former are often put for the latter in the dream, and as far as practicable the sexual presentation complex is transposed to the eating complex. Of articles of dress the woman's hat may frequently be definitely interpreted as the male genital. In dreams of men one often finds the cravat as a symbol for the penis; this indeed is not only because cravats hang down long, and are characteristic of the man, but also because one can select them at pleasure, a freedom which is prohibited by nature in the original of the symbol. Persons who make use of this symbol in the dream are very extravagant with cravats, and possess regular collections of them. All complicated machines and apparatus in dream are very probably genitals, in

the description of which dream symbolism shows itself to be as tireless as the activity of wit. Likewise many landscapes in dreams, especially with bridges or with wooded mountains, can be readily recognized as descriptions of the genitals. Finally where one finds incomprehensible neologisms one may think of combinations made up of components having a sexual significance. Children also in the dream often signify the genitals, as men and women are in the habit of fondly referring to their genital organ as their "little one." As a very recent symbol of the male genital may be mentioned the flying machine, utilization of which is justified by its relation to flying as well as occasionally by its form. To play with a little child or to beat a little one is often the dream's representation of onanism. A number of other symbols, in part not sufficiently verified are given by Stekel, who illustrates them with examples. Right and left, according to him, are to be conceived in the dream in an ethical sense. "The right way always signifies the road to righteousness, the left the one to crime. Thus the left may signify homosexuality, incest, and perversion, while the right signifies marriage, relations with a prostitute, &c. The meaning is always determined by the individual moral view-point of the dreamer." Relatives in the dream generally play the rôle of genitals. Not to be able to catch up with a wagon is interpreted by Stekel as regret not to be able to come up to a difference in age. Baggage with which one travels is the burden of sin by which one is oppressed. Also numbers, which frequently occur in the dream, are assigned by Stekel a fixed symbolical meaning, but these interpretations seem neither sufficiently verified nor of general validity, although the interpretation in individual cases can generally be recognized as probable. In a recently published book by W. Stekel, *Die Sprache des Traumes*, which I was unable to utilize, there is a list of the most common sexual symbols, the object of which is to prove that all sexual symbols can be bisexually used. He states: "Is there a symbol which (if in any way permitted by the phantasy) may not be used simultaneously in the masculine and the feminine sense!" To be sure the clause in parentheses takes away much of the absoluteness of this assertion, for this is not at all permitted by the phantasy. I do not, however, think it superfluous to state that in my experience Stekel's general statement has to give way to the recognition of a greater manifoldness. Besides those symbols, which are just as frequent for the male as for the female genitals, there are others which preponderately, or almost exclusively, designate one of the sexes, and there are still others of which only the male or only the

female signification is known. To use long, firm objects and weapons as symbols of the female genitals, or hollow objects (chests, pouches, &c.), as symbols of the male genitals, is indeed not allowed by the fancy.

It is true that the tendency of the dream and the unconscious fancy to utilize the sexual symbol bisexually betrays an archaic trend, for in childhood a difference in the genitals is unknown, and the same genitals are attributed to both sexes.

These very incomplete suggestions may suffice to stimulate others to make a more careful collection.

I shall now add a few examples of the application of such symbolisms in dreams, which will serve to show how impossible it becomes to interpret a dream without taking into account the symbolism of dreams, and how imperatively it obtrudes itself in many cases.

1. The hat as a symbol of the man (of the male genital): (a fragment from the dream of a young woman who suffered from agoraphobia on account of a fear of temptation).

"I am walking in the street in summer, I wear a straw hat of peculiar shape, the middle piece of which is bent upwards and the side pieces of which hang downwards (the description became here obstructed), and in such a fashion that one is lower than the other. I am cheerful and in a confidential mood, and as I pass a troop of young officers I think to myself: None of you can have any designs upon me."

As she could produce no associations to the hat, I said to her: "The hat is really a male genital, with its raised middle piece and the two downward hanging side pieces." I intentionally refrained from interpreting those details concerning the unequal downward hanging of the two side pieces, although just such individualities in the determinations lead the way to the interpretation. I continued by saying that if she only had a man with such a virile genital she would not have to fear the officers—that is, she would have nothing to wish from them, for she is mainly kept from going without protection and company by her fancies of temptation. This last explanation

of her fear I had already been able to give her repeatedly on the basis of other material.

It is quite remarkable how the dreamer behaved after this interpretation. She withdrew her description of the hat, and claimed not to have said that the two side pieces were hanging downwards. I was, however, too sure of what I had heard to allow myself to be misled, and I persisted in it. She was quiet for a while, and then found the courage to ask why it was that one of her husband's testicles was lower than the other, and whether it was the same in all men. With this the peculiar detail of the hat was explained, and the whole interpretation was accepted by her. The hat symbol was familiar to me long before the patient related this dream. From other but less transparent cases I believe that the hat may also be taken as a female genital.

2. The little one as the genital—to be run over as a symbol of sexual intercourse (another dream of the same agoraphobic patient).

"Her mother sends away her little daughter so that she must go alone. She rides with her mother to the railroad and sees her little one walking directly upon the tracks, so that she cannot avoid being run over. She hears the bones crackle. (From this she experiences a feeling of discomfort but no real horror.) She then looks out through the car window to see whether the parts cannot be seen behind. She then reproaches her mother for allowing the little one to go out alone." Analysis. It is not an easy matter to give here a complete interpretation of the dream. It forms part of a cycle of dreams, and can be fully understood only in connection with the others. For it is not easy to get the necessary material sufficiently isolated to prove the symbolism. The patient at first finds that the railroad journey is to be interpreted historically as an allusion to a departure from a sanatorium for nervous diseases, with the superintendent of which she naturally was in love. Her mother took her away from this place, and the physician came to the railroad station and handed her a bouquet of flowers on leaving; she felt uncomfortable because her mother witnessed this homage. Here the mother, therefore, appears as a disturber of her love affairs, which is the rôle actually played by this strict woman during her daughter's girlhood. The next thought referred to the sentence: "She then looks to see whether the

parts can be seen behind." In the dream façade one would naturally be compelled to think of the parts of the little daughter run over and ground up. The thought, however, turns in quite a different direction. She recalls that she once saw her father in the bath-room naked from behind; she then begins to talk about the sex differentiation, and asserts that in the man the genitals can be seen from behind, but in the woman they cannot. In this connection she now herself offers the interpretation that the little one is the genital, her little one (she has a four-year-old daughter) her own genital. She reproaches her mother for wanting her to live as though she had no genital, and recognizes this reproach in the introductory sentence of the dream; the mother sends away her little one so that she must go alone. In her phantasy going alone on the street signifies to have no man and no sexual relations (coire = to go together), and this she does not like. According to all her statements she really suffered as a girl on account of the jealousy of her mother, because she showed a preference for her father.

The "little one" has been noted as a symbol for the male or the female genitals by Stekel, who can refer in this connection to a very widespread usage of language.

The deeper interpretation of this dream depends upon another dream of the same night in which the dreamer identifies herself with her brother. She was a "tomboy," and was always being told that she should have been born a boy. This identification with the brother shows with special clearness that "the little one" signifies the genital. The mother threatened him (her) with castration, which could only be understood as a punishment for playing with the parts, and the identification, therefore, shows that she herself had masturbated as a child, though this fact she now retained only in memory concerning her brother. An early knowledge of the male genital which she later lost she must have acquired at that time according to the assertions of this second dream. Moreover the second dream points to the infantile sexual theory that girls originate from boys through castration. After I had told her of this childish belief, she at once confirmed it with an anecdote in which the boy asks the girl: "Was it cut off?" to which the girl replied, "No, it's always been so."

The sending away of the little one, of the genital, in the first dream therefore also refers to the threatened castration. Finally she blames her mother for not having been born a boy.

That "being run over" symbolizes sexual intercourse would not be evident from this dream if we were not sure of it from many other sources.

3. Representation of the genital by structures, stairways, and shafts. (Dream of a young man inhibited by a father complex.)

"He is taking a walk with his father in a place which is surely the Prater, for the *Rotunda* may be seen in front of which there is a small front structure to which is attached a captive balloon; the balloon, however, seems quite collapsed. His father asks him what this is all for; he is surprised at it, but he explains it to his father. They come into a court in which lies a large sheet of tin. His father wants to pull off a big piece of this, but first looks around to see if any one is watching. He tells his father that all he needs to do is to speak to the watchman, and then he can take without any further difficulty as much as he wants to. From this court a stairway leads down into a shaft, the walls of which are softly upholstered something like a leather pocketbook. At the end of this shaft there is a longer platform, and then a new shaft begins...."

Analysis. This dream belongs to a type of patient which is not favorable from a therapeutic point of view. They follow in the analysis without offering any resistances whatever up to a certain point, but from that point on they remain almost inaccessible. This dream he almost analyzed himself. "The Rotunda," he said, "is my genital, the captive balloon in front is my penis, about the weakness of which I have worried." We must, however, interpret in greater detail; the Rotunda is the buttock which is regularly associated by the child with the genital, the smaller front structure is the scrotum. In the dream his father asks him what this is all for—that is, he asks him about the purpose and arrangement of the genitals. It is quite evident that this state of affairs should be turned around, and that he should be the questioner. As such a questioning on the side of the father has never taken place in reality, we must conceive the dream thought as a wish, or take it conditionally, as follows: "If I had only asked my father for sexual

enlightenment." The continuation of this thought we shall soon find in another place.

The court in which the tin sheet is spread out is not to be conceived symbolically in the first instance, but originates from his father's place of business. For discretionary reasons I have inserted the tin for another material in which the father deals, without, however, changing anything in the verbal expression of the dream. The dreamer had entered his father's business, and had taken a terrible dislike to the questionable practices upon which profit mainly depends. Hence the continuation of the above dream thought ("if I had only asked him") would be: "He would have deceived me just as he does his customers." For the pulling off, which serves to represent commercial dishonesty, the dreamer himself gives a second explanation—namely, onanism. This is not only entirely familiar to us, but agrees very well with the fact that the secrecy of onanism is expressed by its opposite ("Why one can do it quite openly"). It, moreover, agrees entirely with our expectations that the onanistic activity is again put off on the father, just as was the questioning in the first scene of the dream. The shaft he at once interprets as the vagina by referring to the soft upholstering of the walls. That the act of coition in the vagina is described as a going down instead of in the usual way as a going up, I have also found true in other instances².

The details that at the end of the first shaft there is a longer platform and then a new shaft, he himself explains biographically. He had for some time consorted with women sexually, but had then given it up because of inhibitions and now hopes to be able to take it up again with the aid of the treatment. The dream, however, becomes indistinct toward the end, and to the experienced interpreter it becomes evident that in the second scene of the dream the influence of another subject has begun to assert itself; in this his father's business and his dishonest practices signify the first vagina represented as a shaft so that one might think of a reference to the mother.

4. The male genital symbolized by persons and the female by a landscape.

(Dream of a woman of the lower class, whose husband is a policeman, reported by B. Dattner.)

... Then some one broke into the house and anxiously called for a policeman. But he went with two tramps by mutual consent into a church,³ to which led a great many stairs;⁴ behind the church there was a mountain,⁵ on top of which a dense forest.⁶ The policeman was furnished with a helmet, a gorget, and a cloak.⁷ The two vagrants, who went along with the policeman quite peaceably, had tied to their loins sack-like aprons.⁸ A road led from the church to the mountain. This road was overgrown on each side with grass and brushwood, which became thicker and thicker as it reached the height of the mountain, where it spread out into quite a forest.

5. A stairway dream.

(Reported and interpreted by Otto Rank.)

For the following transparent pollution dream, I am indebted to the same colleague who furnished us with the dental-irritation dream.

"I am running down the stairway in the stair-house after a little girl, whom I wish to punish because she has done something to me. At the bottom of the stairs some one held the child for me. (A grown-up woman?) I grasp it, but do not know whether I have hit it, for I suddenly find myself in the middle of the stairway where I practice coitus with the child (in the air as it were). It is really no coitus, I only rub my genital on her external genital, and in doing this I see it very distinctly, as distinctly as I see her head which is lying sideways. During the sexual act I see hanging to the left and above me (also as if in the air) two small pictures, landscapes, representing a house on a green. On the smaller one my surname stood in the place where the painter's signature should be; it seemed to be intended for my birthday present. A small sign hung in front of the pictures to the effect that cheaper pictures could also be obtained. I then see myself very indistinctly lying in bed, just as I had seen myself at the foot of the stairs, and I am awakened by a feeling of dampness which came from the pollution."

Interpretation. The dreamer had been in a book-store on the evening of the day of the dream, where, while he was waiting, he examined some pictures which were exhibited, which represented motives similar to the dream pictures. He stepped nearer to a small picture which particularly took his

fancy in order to see the name of the artist, which, however, was quite unknown to him.

Later in the same evening, in company, he heard about a Bohemian servant-girl who boasted that her illegitimate child "was made on the stairs." The dreamer inquired about the details of this unusual occurrence, and learned that the servant-girl went with her lover to the home of her parents, where there was no opportunity for sexual relations, and that the excited man performed the act on the stairs. In witty allusion to the mischievous expression used about wine-adulterers, the dreamer remarked, "The child really grew on the cellar steps."

These experiences of the day, which are quite prominent in the dream content, were readily reproduced by the dreamer. But he just as readily reproduced an old fragment of infantile recollection which was also utilized by the dream. The stair-house was the house in which he had spent the greatest part of his childhood, and in which he had first become acquainted with sexual problems. In this house he used, among other things, to slide down the banister astride which caused him to become sexually excited. In the dream he also comes down the stairs very rapidly—so rapidly that, according to his own distinct assertions, he hardly touched the individual stairs, but rather "flew" or "slid down," as we used to say. Upon reference to this infantile experience, the beginning of the dream seems to represent the factor of sexual excitement. In the same house and in the adjacent residence the dreamer used to play pugnacious games with the neighboring children, in which he satisfied himself just as he did in the dream.

If one recalls from Freud's investigation of sexual symbolism⁹ that in the dream stairs or climbing stairs almost regularly symbolizes coitus, the dream becomes clear. Its motive power as well as its effect, as is shown by the pollution, is of a purely libidinous nature. Sexual excitement became aroused during the sleeping state (in the dream this is represented by the rapid running or sliding down the stairs) and the sadistic thread in this is, on the basis of the pugnacious playing, indicated in the pursuing and overcoming of the child. The libidinous excitement becomes enhanced and urges to sexual action (represented in the dream by the grasping of the child and the conveyance of it to the middle of the stairway). Up to this point the

dream would be one of pure, sexual symbolism, and obscure for the unpracticed dream interpreter. But this symbolic gratification, which would have insured undisturbed sleep, was not sufficient for the powerful libidinous excitement. The excitement leads to an orgasm, and thus the whole stairway symbolism is unmasked as a substitute for coitus. Freud lays stress on the rhythmical character of both actions as one of the reasons for the sexual utilization of the stairway symbolism, and this dream especially seems to corroborate this, for, according to the express assertion of the dreamer, the rhythm of a sexual act was the most pronounced feature in the whole dream.

Still another remark concerning the two pictures, which, aside from their real significance, also have the value of "Weibsbilder" (literally *woman-pictures*, but idiomatically *women*). This is at once shown by the fact that the dream deals with a big and a little picture, just as the dream content presents a big (grown up) and a little girl. That cheap pictures could also be obtained points to the prostitution complex, just as the dreamer's surname on the little picture and the thought that it was intended for his birthday, point to the parent complex (to be born on the stairway—to be conceived in coitus).

The indistinct final scene, in which the dreamer sees himself on the staircase landing lying in bed and feeling wet, seems to go back into childhood even beyond the infantile onanism, and manifestly has its prototype in similarly pleasurable scenes of bed-wetting.

6. A modified stair-dream.

To one of my very nervous patients, who was an abstainer, whose fancy was fixed on his mother, and who repeatedly dreamed of climbing stairs accompanied by his mother, I once remarked that moderate masturbation would be less harmful to him than enforced abstinence. This influence provoked the following dream:

"His piano teacher reproaches him for neglecting his piano-playing, and for not practicing the *Etudes* of Moscheles and Clementi's *Gradus ad Parnassum*." In relation to this he remarked that the *Gradus* is only a stairway, and that the piano itself is only a stairway as it has a scale.

It is correct to say that there is no series of associations which cannot be adapted to the representation of sexual facts. I conclude with the dream of a chemist, a young man, who has been trying to give up his habit of masturbation by replacing it with intercourse with women.

Preliminary statement.—On the day before the dream he had given a student instruction concerning Grignard's reaction, in which magnesium is to be dissolved in absolutely pure ether under the catalytic influence of iodine. Two days before, there had been an explosion in the course of the same reaction, in which the investigator had burned his hand.

Dream I. He is to make phenylmagnesium-bromid; he sees the apparatus with particular clearness, but he has substituted himself for the magnesium. He is now in a curious swaying attitude. He keeps repeating to himself, "This is the right thing, it is working, my feet are beginning to dissolve and my knees are getting soft." Then he reaches down and feels for his feet, and meanwhile (he does not know how) he takes his legs out of the crucible, and then again he says to himself, "That cannot be.... Yes, it must be so, it has been done correctly." Then he partially awakens, and repeats the dream to himself, because he wants to tell it to me. He is distinctly afraid of the analysis of the dream. He is much excited during this semi-sleeping state, and repeats continually, "Phenyl, phenyl."

II. He is ining with his whole family; at half-past eleven. He is to be at the Schottenthor for a rendezvous with a certain lady, but he does not wake up until half-past eleven. He says to himself, "It is too late now; when you get there it will be half-past twelve." The next instant he sees the whole family gathered about the table—his mother and the servant girl with the soup-tureen with particular clearness. Then he says to himself, "Well, if we are eating already, I certainly can't get away."

Analysis: He feels sure that even the first dream contains a reference to the lady whom he is to meet at the rendezvous (the dream was dreamed during the night before the expected meeting). The student to whom he gave the instruction is a particularly unpleasant fellow; he had said to the chemist: "That isn't right," because the magnesium was still unaffected, and the latter answered as though he did not care anything about it: "It certainly isn't right." He himself must be this student; he is as indifferent towards his

analysis as the student is towards his synthesis; the *He* in the dream, however, who accomplishes the operation, is myself. How unpleasant he must seem to me with his indifference towards the success achieved!

Moreover, he is the material with which the analysis (synthesis) is made. For it is a question of the success of the treatment. The legs in the dream recall an impression of the previous evening. He met a lady at a dancing lesson whom he wished to conquer; he pressed her to him so closely that she once cried out. After he had stopped pressing against her legs, he felt her firm responding pressure against his lower thighs as far as just above his knees, at the place mentioned in the dream. In this situation, then, the woman is the magnesium in the retort, which is at last working. He is feminine towards me, as he is masculine towards the woman. If it will work with the woman, the treatment will also work. Feeling and becoming aware of himself in the region of his knees refers to masturbation, and corresponds to his fatigue of the previous day.... The rendezvous had actually been set for half-past eleven. His wish to oversleep and to remain with his usual sexual objects (that is, with masturbation) corresponds with his resistance.

[Footnote 1](#): It is only of late that I have learned to value the significance of fancies and unconscious thoughts about life in the womb. They contain the explanation of the curious fear felt by so many people of being buried alive, as well as the profoundest unconscious reason for the belief in a life after death which represents nothing but a projection into the future of this mysterious life before birth. *The act of birth, moreover, is the first experience with fear, and is thus the source and model of the emotion of fear.*

[Footnote 2](#): Cf. *Zentralblatt für psychoanalyse*, I.

[Footnote 3](#): Or chapel—vagina.

[Footnote 4](#): Symbol of coitus.

[Footnote 5](#): Mons veneris.

[Footnote 6](#): Crines pubis.

[Footnote 7](#): Demons in cloaks and capucines are, according to the explanation of a man versed in the subject, of a phallic nature.

[Footnote 8](#): The two halves of the scrotum.

[Footnote 9](#): See *Zentralblatt für Psychoanalyse*, vol. i., p. 2.

VI

THE WISH IN DREAMS

That the dream should be nothing but a wish-fulfillment surely seemed strange to us all—and that not alone because of the contradictions offered by the anxiety dream.

After learning from the first analytical explanations that the dream conceals sense and psychic validity, we could hardly expect so simple a determination of this sense. According to the correct but concise definition of Aristotle, the dream is a continuation of thinking in sleep (in so far as one sleeps). Considering that during the day our thoughts produce such a diversity of psychic acts—judgments, conclusions, contradictions, expectations, intentions, &c.—why should our sleeping thoughts be forced to confine themselves to the production of wishes? Are there not, on the contrary, many dreams that present a different psychic act in dream form, *e.g.*, a solicitude, and is not the very transparent father's dream mentioned above of just such a nature? From the gleam of light falling into his eyes while asleep the father draws the solicitous conclusion that a candle has been upset and may have set fire to the corpse; he transforms this conclusion into a dream by investing it with a senseful situation enacted in the present tense. What part is played in this dream by the wish-fulfillment, and which are we to suspect—the predominance of the thought continued from, the waking state or of the thought incited by the new sensory impression?

All these considerations are just, and force us to enter more deeply into the part played by the wish-fulfillment in the dream, and into the significance of the waking thoughts continued in sleep.

It is in fact the wish-fulfillment that has already induced us to separate dreams into two groups. We have found some dreams that were plainly wish-fulfillments; and others in which wish-fulfillment could not be recognized, and was frequently concealed by every available means. In this

latter class of dreams we recognized the influence of the dream censor. The undisguised wish dreams were chiefly found in children, yet fleeting open-hearted wish dreams *seemed* (I purposely emphasize this word) to occur also in adults.

We may now ask whence the wish fulfilled in the dream originates. But to what opposition or to what diversity do we refer this "whence"? I think it is to the opposition between conscious daily life and a psychic activity remaining unconscious which can only make itself noticeable during the night. I thus find a threefold possibility for the origin of a wish. Firstly, it may have been incited during the day, and owing to external circumstances failed to find gratification, there is thus left for the night an acknowledged but unfulfilled wish. Secondly, it may come to the surface during the day but be rejected, leaving an unfulfilled but suppressed wish. Or, thirdly, it may have no relation to daily life, and belong to those wishes that originate during the night from the suppression. If we now follow our scheme of the psychic apparatus, we can localize a wish of the first order in the system Forec. We may assume that a wish of the second order has been forced back from the Forec. system into the Unc. system, where alone, if anywhere, it can maintain itself; while a wish-feeling of the third order we consider altogether incapable of leaving the Unc. system. This brings up the question whether wishes arising from these different sources possess the same value for the dream, and whether they have the same power to incite a dream.

On reviewing the dreams which we have at our disposal for answering this question, we are at once moved to add as a fourth source of the dream-wish the actual wish incitements arising during the night, such as thirst and sexual desire. It then becomes evident that the source of the dream-wish does not affect its capacity to incite a dream. That a wish suppressed during the day asserts itself in the dream can be shown by a great many examples. I shall mention a very simple example of this class. A somewhat sarcastic young lady, whose younger friend has become engaged to be married, is asked throughout the day by her acquaintances whether she knows and what she thinks of the fiancé. She answers with unqualified praise, thereby silencing her own judgment, as she would prefer to tell the truth, namely, that he is an ordinary person. The following night she dreams that the same question is put to her, and that she replies with the formula: "In case of

subsequent orders it will suffice to mention the number." Finally, we have learned from numerous analyses that the wish in all dreams that have been subject to distortion has been derived from the unconscious, and has been unable to come to perception in the waking state. Thus it would appear that all wishes are of the same value and force for the dream formation.

I am at present unable to prove that the state of affairs is really different, but I am strongly inclined to assume a more stringent determination of the dream-wish. Children's dreams leave no doubt that an unfulfilled wish of the day may be the instigator of the dream. But we must not forget that it is, after all, the wish of a child, that it is a wish-feeling of infantile strength only. I have a strong doubt whether an unfulfilled wish from the day would suffice to create a dream in an adult. It would rather seem that as we learn to control our impulses by intellectual activity, we more and more reject as vain the formation or retention of such intense wishes as are natural to childhood. In this, indeed, there may be individual variations; some retain the infantile type of psychic processes longer than others. The differences are here the same as those found in the gradual decline of the originally distinct visual imagination.

In general, however, I am of the opinion that unfulfilled wishes of the day are insufficient to produce a dream in adults. I readily admit that the wish instigators originating in conscious like contribute towards the incitement of dreams, but that is probably all. The dream would not originate if the foreconscious wish were not reinforced from another source.

That source is the unconscious. I believe that *the conscious wish is a dream inciter only if it succeeds in arousing a similar unconscious wish which reinforces it*. Following the suggestions obtained through the psychoanalysis of the neuroses, I believe that these unconscious wishes are always active and ready for expression whenever they find an opportunity to unite themselves with an emotion from conscious life, and that they transfer their greater intensity to the lesser intensity of the latter.¹ It may therefore seem that the conscious wish alone has been realized in a dream; but a slight peculiarity in the formation of this dream will put us on the track of the powerful helper from the unconscious. These ever active and, as it were, immortal wishes from the unconscious recall the legendary

Titans who from time immemorial have borne the ponderous mountains which were once rolled upon them by the victorious gods, and which even now quiver from time to time from the convulsions of their mighty limbs; I say that these wishes found in the repression are of themselves of an infantile origin, as we have learned from the psychological investigation of the neuroses. I should like, therefore, to withdraw the opinion previously expressed that it is unimportant whence the dream-wish originates, and replace it by another, as follows: *The wish manifested in the dream must be an infantile one.* In the adult it originates in the Unc., while in the child, where no separation and censor as yet exist between Forec. and Unc., or where these are only in the process of formation, it is an unfulfilled and unrepressed wish from the waking state. I am aware that this conception cannot be generally demonstrated, but I maintain nevertheless that it can be frequently demonstrated, even when it was not suspected, and that it cannot be generally refuted.

The wish-feelings which remain from the conscious waking state are, therefore, relegated to the background in the dream formation. In the dream content I shall attribute to them only the part attributed to the material of actual sensations during sleep. If I now take into account those other psychic instigations remaining from the waking state which are not wishes, I shall only adhere to the line mapped out for me by this train of thought. We may succeed in provisionally terminating the sum of energy of our waking thoughts by deciding to go to sleep. He is a good sleeper who can do this; Napoleon I. is reputed to have been a model of this sort. But we do not always succeed in accomplishing it, or in accomplishing it perfectly. Unsolved problems, harassing cares, overwhelming impressions continue the thinking activity even during sleep, maintaining psychic processes in the system which we have termed the foreconscious. These mental processes continuing into sleep may be divided into the following groups: 1, That which has not been terminated during the day owing to casual prevention; 2, that which has been left unfinished by temporary paralysis of our mental power, *i.e.* the unsolved; 3, that which has been rejected and suppressed during the day. This unites with a powerful group (4) formed by that which has been excited in our Unc. during the day by the work of the foreconscious. Finally, we may add group (5) consisting of the indifferent and hence unsettled impressions of the day.

We should not underrate the psychic intensities introduced into sleep by these remnants of waking life, especially those emanating from the group of the unsolved. These excitations surely continue to strive for expression during the night, and we may assume with equal certainty that the sleeping state renders impossible the usual continuation of the excitement in the foreconscious and the termination of the excitement by its becoming conscious. As far as we can normally become conscious of our mental processes, even during the night, in so far we are not asleep. I shall not venture to state what change is produced in the Forec. system by the sleeping state, but there is no doubt that the psychological character of sleep is essentially due to the change of energy in this very system, which also dominates the approach to motility, which is paralyzed during sleep. In contradistinction to this, there seems to be nothing in the psychology of the dream to warrant the assumption that sleep produces any but secondary changes in the conditions of the Unc. system. Hence, for the nocturnal excitation in the Force, there remains no other path than that followed by the wish excitations from the Unc. This excitation must seek reinforcement from the Unc., and follow the detours of the unconscious excitations. But what is the relation of the foreconscious day remnants to the dream? There is no doubt that they penetrate abundantly into the dream, that they utilize the dream content to obtrude themselves upon consciousness even during the night; indeed, they occasionally even dominate the dream content, and impel it to continue the work of the day; it is also certain that the day remnants may just as well have any other character as that of wishes; but it is highly instructive and even decisive for the theory of wish-fulfillment to see what conditions they must comply with in order to be received into the dream.

Let us pick out one of the dreams cited above as examples, *e.g.*, the dream in which my friend Otto seems to show the symptoms of Basedow's disease. My friend Otto's appearance occasioned me some concern during the day, and this worry, like everything else referring to this person, affected me. I may also assume that these feelings followed me into sleep. I was probably bent on finding out what was the matter with him. In the night my worry found expression in the dream which I have reported, the content of which was not only senseless, but failed to show any wish-fulfillment. But I began to investigate for the source of this incongruous expression of the

solicitude felt during the day, and analysis revealed the connection. I identified my friend Otto with a certain Baron L. and myself with a Professor R. There was only one explanation for my being impelled to select just this substitution for the day thought. I must have always been prepared in the Unc. to identify myself with Professor R., as it meant the realization of one of the immortal infantile wishes, viz. that of becoming great. Repulsive ideas respecting my friend, that would certainly have been repudiated in a waking state, took advantage of the opportunity to creep into the dream, but the worry of the day likewise found some form of expression through a substitution in the dream content. The day thought, which was no wish in itself but rather a worry, had in some way to find a connection with the infantile now unconscious and suppressed wish, which then allowed it, though already properly prepared, to "originate" for consciousness. The more dominating this worry, the stronger must be the connection to be established; between the contents of the wish and that of the worry there need be no connection, nor was there one in any of our examples.

We can now sharply define the significance of the unconscious wish for the dream. It may be admitted that there is a whole class of dreams in which the incitement originates preponderatingly or even exclusively from the remnants of daily life; and I believe that even my cherished desire to become at some future time a "professor extraordinarius" would have allowed me to slumber undisturbed that night had not my worry about my friend's health been still active. But this worry alone would not have produced a dream; the motive power needed by the dream had to be contributed by a wish, and it was the affair of the worry to procure for itself such wish as a motive power of the dream. To speak figuratively, it is quite possible that a day thought plays the part of the contractor (*entrepreneur*) in the dream. But it is known that no matter what idea the contractor may have in mind, and how desirous he may be of putting it into operation, he can do nothing without capital; he must depend upon a capitalist to defray the necessary expenses, and this capitalist, who supplies the psychic expenditure for the dream is invariably and indisputably *a wish from the unconscious*, no matter what the nature of the waking thought may be.

In other cases the capitalist himself is the contractor for the dream; this, indeed, seems to be the more usual case. An unconscious wish is produced by the day's work, which in turn creates the dream. The dream processes, moreover, run parallel with all the other possibilities of the economic relationship used here as an illustration. Thus, the entrepreneur may contribute some capital himself, or several entrepreneurs may seek the aid of the same capitalist, or several capitalists may jointly supply the capital required by the entrepreneur. Thus there are dreams produced by more than one dream-wish, and many similar variations which may readily be passed over and are of no further interest to us. What we have left unfinished in this discussion of the dream-wish we shall be able to develop later.

The "tertium comparationis" in the comparisons just employed—*i.e.* the sum placed at our free disposal in proper allotment—admits of still finer application for the illustration of the dream structure. We can recognize in most dreams a center especially supplied with perceptible intensity. This is regularly the direct representation of the wish-fulfillment; for, if we undo the displacements of the dream-work by a process of retrogression, we find that the psychic intensity of the elements in the dream thoughts is replaced by the perceptible intensity of the elements in the dream content. The elements adjoining the wish-fulfillment have frequently nothing to do with its sense, but prove to be descendants of painful thoughts which oppose the wish. But, owing to their frequently artificial connection with the central element, they have acquired sufficient intensity to enable them to come to expression. Thus, the force of expression of the wish-fulfillment is diffused over a certain sphere of association, within which it raises to expression all elements, including those that are in themselves impotent. In dreams having several strong wishes we can readily separate from one another the spheres of the individual wish-fulfillments; the gaps in the dream likewise can often be explained as boundary zones.

Although the foregoing remarks have considerably limited the significance of the day remnants for the dream, it will nevertheless be worth our while to give them some attention. For they must be a necessary ingredient in the formation of the dream, inasmuch as experience reveals the surprising fact that every dream shows in its content a connection with some impression of a recent day, often of the most indifferent kind. So far we have failed to see

any necessity for this addition to the dream mixture. This necessity appears only when we follow closely the part played by the unconscious wish, and then seek information in the psychology of the neuroses. We thus learn that the unconscious idea, as such, is altogether incapable of entering into the foreconscious, and that it can exert an influence there only by uniting with a harmless idea already belonging to the foreconscious, to which it transfers its intensity and under which it allows itself to be concealed. This is the fact of transference which furnishes an explanation for so many surprising occurrences in the psychic life of neurotics.

The idea from the foreconscious which thus obtains an unmerited abundance of intensity may be left unchanged by the transference, or it may have forced upon it a modification from the content of the transferring idea. I trust the reader will pardon my fondness for comparisons from daily life, but I feel tempted to say that the relations existing for the repressed idea are similar to the situations existing in Austria for the American dentist, who is forbidden to practise unless he gets permission from a regular physician to use his name on the public signboard and thus cover the legal requirements. Moreover, just as it is naturally not the busiest physicians who form such alliances with dental practitioners, so in the psychic life only such foreconscious or conscious ideas are chosen to cover a repressed idea as have not themselves attracted much of the attention which is operative in the foreconscious. The unconscious entangles with its connections preferentially either those impressions and ideas of the foreconscious which have been left unnoticed as indifferent, or those that have soon been deprived of this attention through rejection. It is a familiar fact from the association studies confirmed by every experience, that ideas which have formed intimate connections in one direction assume an almost negative attitude to whole groups of new connections. I once tried from this principle to develop a theory for hysterical paralysis.

If we assume that the same need for the transference of the repressed ideas which we have learned to know from the analysis of the neuroses makes its influence felt in the dream as well, we can at once explain two riddles of the dream, viz. that every dream analysis shows an interweaving of a recent impression, and that this recent element is frequently of the most indifferent character. We may add what we have already learned elsewhere, that these

recent and indifferent elements come so frequently into the dream content as a substitute for the most deep-lying of the dream thoughts, for the further reason that they have least to fear from the resisting censor. But while this freedom from censorship explains only the preference for trivial elements, the constant presence of recent elements points to the fact that there is a need for transference. Both groups of impressions satisfy the demand of the repression for material still free from associations, the indifferent ones because they have offered no inducement for extensive associations, and the recent ones because they have had insufficient time to form such associations.

We thus see that the day remnants, among which we may now include the indifferent impressions when they participate in the dream formation, not only borrow from the Unc. the motive power at the disposal of the repressed wish, but also offer to the unconscious something indispensable, namely, the attachment necessary to the transference. If we here attempted to penetrate more deeply into the psychic processes, we should first have to throw more light on the play of emotions between the foreconscious and the unconscious, to which, indeed, we are urged by the study of the psychoneuroses, whereas the dream itself offers no assistance in this respect.

Just one further remark about the day remnants. There is no doubt that they are the actual disturbers of sleep, and not the dream, which, on the contrary, strives to guard sleep. But we shall return to this point later.

We have so far discussed the dream-wish, we have traced it to the sphere of the Unc., and analyzed its relations to the day remnants, which in turn may be either wishes, psychic emotions of any other kind, or simply recent impressions. We have thus made room for any claims that may be made for the importance of conscious thought activity in dream formations in all its variations. Relying upon our thought series, it would not be at all impossible for us to explain even those extreme cases in which the dream as a continuer of the day work brings to a happy conclusion and unsolved problem possess an example, the analysis of which might reveal the infantile or repressed wish source furnishing such alliance and successful strengthening of the efforts of the foreconscious activity. But we have not

come one step nearer a solution of the riddle: Why can the unconscious furnish the motive power for the wish-fulfillment only during sleep? The answer to this question must throw light on the psychic nature of wishes; and it will be given with the aid of the diagram of the psychic apparatus.

We do not doubt that even this apparatus attained its present perfection through a long course of development. Let us attempt to restore it as it existed in an early phase of its activity. From assumptions, to be confirmed elsewhere, we know that at first the apparatus strove to keep as free from excitement as possible, and in its first formation, therefore, the scheme took the form of a reflex apparatus, which enabled it promptly to discharge through the motor tracts any sensible stimulus reaching it from without. But this simple function was disturbed by the wants of life, which likewise furnish the impulse for the further development of the apparatus. The wants of life first manifested themselves to it in the form of the great physical needs. The excitement aroused by the inner want seeks an outlet in motility, which may be designated as "inner changes" or as an "expression of the emotions." The hungry child cries or fidgets helplessly, but its situation remains unchanged; for the excitation proceeding from an inner want requires, not a momentary outbreak, but a force working continuously. A change can occur only if in some way a feeling of gratification is experienced—which in the case of the child must be through outside help—in order to remove the inner excitement. An essential constituent of this experience is the appearance of a certain perception (of food in our example), the memory picture of which thereafter remains associated with the memory trace of the excitation of want.

Thanks to the established connection, there results at the next appearance of this want a psychic feeling which revives the memory picture of the former perception, and thus recalls the former perception itself, *i.e.* it actually re-establishes the situation of the first gratification. We call such a feeling a wish; the reappearance of the perception constitutes the wish-fulfillment, and the full revival of the perception by the want excitement constitutes the shortest road to the wish-fulfillment. We may assume a primitive condition of the psychic apparatus in which this road is really followed, *i.e.* where the wishing merges into an hallucination, This first psychic activity therefore

aims at an identity of perception, *i.e.* it aims at a repetition of that perception which is connected with the fulfillment of the want.

This primitive mental activity must have been modified by bitter practical experience into a more expedient secondary activity. The establishment of the identity perception on the short regressive road within the apparatus does not in another respect carry with it the result which inevitably follows the revival of the same perception from without. The gratification does not take place, and the want continues. In order to equalize the internal with the external sum of energy, the former must be continually maintained, just as actually happens in the hallucinatory psychoses and in the deliriums of hunger which exhaust their psychic capacity in clinging to the object desired. In order to make more appropriate use of the psychic force, it becomes necessary to inhibit the full regression so as to prevent it from extending beyond the image of memory, whence it can select other paths leading ultimately to the establishment of the desired identity from the outer world. This inhibition and consequent deviation from the excitation becomes the task of a second system which dominates the voluntary motility, *i.e.* through whose activity the expenditure of motility is now devoted to previously recalled purposes. But this entire complicated mental activity which works its way from the memory picture to the establishment of the perception identity from the outer world merely represents a detour which has been forced upon the wish-fulfillment by experience.² Thinking is indeed nothing but the equivalent of the hallucinatory wish; and if the dream be called a wish-fulfillment this becomes self-evident, as nothing but a wish can impel our psychic apparatus to activity. The dream, which in fulfilling its wishes follows the short regressive path, thereby preserves for us only an example of the primary form of the psychic apparatus which has been abandoned as inexpedient. What once ruled in the waking state when the psychic life was still young and unfit seems to have been banished into the sleeping state, just as we see again in the nursery the bow and arrow, the discarded primitive weapons of grown-up humanity. *The dream is a fragment of the abandoned psychic life of the child.* In the psychoses these modes of operation of the psychic apparatus, which are normally suppressed in the waking state, reassert themselves, and then betray their inability to satisfy our wants in the outer world.

The unconscious wish-feelings evidently strive to assert themselves during the day also, and the fact of transference and the psychoses teach us that they endeavor to penetrate to consciousness and dominate motility by the road leading through the system of the foreconscious. It is, therefore, the censor lying between the Unc. and the Forec., the assumption of which is forced upon us by the dream, that we have to recognize and honor as the guardian of our psychic health. But is it not carelessness on the part of this guardian to diminish its vigilance during the night and to allow the suppressed emotions of the Unc. to come to expression, thus again making possible the hallucinatory regression? I think not, for when the critical guardian goes to rest—and we have proof that his slumber is not profound—he takes care to close the gate to motility. No matter what feelings from the otherwise inhibited Unc. may roam about on the scene, they need not be interfered with; they remain harmless because they are unable to put in motion the motor apparatus which alone can exert a modifying influence upon the outer world. Sleep guarantees the security of the fortress which is under guard. Conditions are less harmless when a displacement of forces is produced, not through a nocturnal diminution in the operation of the critical censor, but through pathological enfeeblement of the latter or through pathological reinforcement of the unconscious excitations, and this while the foreconscious is charged with energy and the avenues to motility are open. The guardian is then overpowered, the unconscious excitations subdue the Forec.; through it they dominate our speech and actions, or they enforce the hallucinatory regression, thus governing an apparatus not designed for them by virtue of the attraction exerted by the perceptions on the distribution of our psychic energy. We call this condition a psychosis.

We are now in the best position to complete our psychological construction, which has been interrupted by the introduction of the two systems, Unc. and Forec. We have still, however, ample reason for giving further consideration to the wish as the sole psychic motive power in the dream. We have explained that the reason why the dream is in every case a wish realization is because it is a product of the Unc., which knows no other aim in its activity but the fulfillment of wishes, and which has no other forces at its disposal but wish-feelings. If we avail ourselves for a moment longer of the right to elaborate from the dream interpretation such far-reaching psychological speculations, we are in duty bound to demonstrate that we are

thereby bringing the dream into a relationship which may also comprise other psychic structures. If there exists a system of the Unc.—or something sufficiently analogous to it for the purpose of our discussion—the dream cannot be its sole manifestation; every dream may be a wish-fulfillment, but there must be other forms of abnormal wish-fulfillment beside this of dreams. Indeed, the theory of all psychoneurotic symptoms culminates in the proposition *that they too must be taken as wish-fulfillments of the unconscious*. Our explanation makes the dream only the first member of a group most important for the psychiatrist, an understanding of which means the solution of the purely psychological part of the psychiatric problem. But other members of this group of wish-fulfillments, *e.g.*, the hysterical symptoms, evince one essential quality which I have so far failed to find in the dream. Thus, from the investigations frequently referred to in this treatise, I know that the formation of an hysterical symptom necessitates the combination of both streams of our psychic life. The symptom is not merely the expression of a realized unconscious wish, but it must be joined by another wish from the foreconscious which is fulfilled by the same symptom; so that the symptom is at least doubly determined, once by each one of the conflicting systems. Just as in the dream, there is no limit to further over-determination. The determination not derived from the Unc. is, as far as I can see, invariably a stream of thought in reaction against the unconscious wish, *e.g.*, a self-punishment. Hence I may say, in general, that *an hysterical symptom originates only where two contrasting wish-fulfillments, having their source in different psychic systems, are able to combine in one expression*. (Compare my latest formulation of the origin of the hysterical symptoms in a treatise published by the *Zeitschrift für Sexualwissenschaft*, by Hirschfeld and others, 1908). Examples on this point would prove of little value, as nothing but a complete unveiling of the complication in question would carry conviction. I therefore content myself with the mere assertion, and will cite an example, not for conviction but for explication. The hysterical vomiting of a female patient proved, on the one hand, to be the realization of an unconscious fancy from the time of puberty, that she might be continuously pregnant and have a multitude of children, and this was subsequently united with the wish that she might have them from as many men as possible. Against this immoderate wish there arose a powerful defensive impulse. But as the vomiting might spoil the patient's figure and beauty, so that she would not find favor in the eyes

of mankind, the symptom was therefore in keeping with her punitive trend of thought, and, being thus admissible from both sides, it was allowed to become a reality. This is the same manner of consenting to a wish-fulfillment which the queen of the Parthians chose for the triumvir Crassus. Believing that he had undertaken the campaign out of greed for gold, she caused molten gold to be poured into the throat of the corpse. "Now hast thou what thou hast longed for." As yet we know of the dream only that it expresses a wish-fulfillment of the unconscious; and apparently the dominating foreconscious permits this only after it has subjected the wish to some distortions. We are really in no position to demonstrate regularly a stream of thought antagonistic to the dream-wish which is realized in the dream as in its counterpart. Only now and then have we found in the dream traces of reaction formations, as, for instance, the tenderness toward friend R. in the "uncle dream." But the contribution from the foreconscious, which is missing here, may be found in another place. While the dominating system has withdrawn on the wish to sleep, the dream may bring to expression with manifold distortions a wish from the Unc., and realize this wish by producing the necessary changes of energy in the psychic apparatus, and may finally retain it through the entire duration of sleep.³

This persistent wish to sleep on the part of the foreconscious in general facilitates the formation of the dream. Let us refer to the dream of the father who, by the gleam of light from the death chamber, was brought to the conclusion that the body has been set on fire. We have shown that one of the psychic forces decisive in causing the father to form this conclusion, instead of being awakened by the gleam of light, was the wish to prolong the life of the child seen in the dream by one moment. Other wishes proceeding from the repression probably escape us, because we are unable to analyze this dream. But as a second motive power of the dream we may mention the father's desire to sleep, for, like the life of the child, the sleep of the father is prolonged for a moment by the dream. The underlying motive is: "Let the dream go on, otherwise I must wake up." As in this dream so also in all other dreams, the wish to sleep lends its support to the unconscious wish. We reported dreams which were apparently dreams of convenience. But, properly speaking, all dreams may claim this designation. The efficacy of the wish to continue to sleep is the most easily recognized in the waking dreams, which so transform the objective sensory stimulus as to render it compatible with the continuance of sleep; they interweave this stimulus with the dream in order to rob it of any claims it might make as a warning to the outer world. But this wish to continue to sleep must also participate in the formation of all other dreams which may disturb the sleeping state from within only. "Now, then, sleep on; why, it's but a dream"; this is in many cases the suggestion of the Forec. to consciousness when the dream goes too far; and this also describes in a general way the attitude of our dominating psychic activity toward dreaming, though the thought remains tacit. I must draw the conclusion that *throughout our entire sleeping state we are just as certain that we are dreaming as we are certain that we are sleeping*. We are compelled to disregard the objection urged against this conclusion that our consciousness is never directed to a knowledge of the former, and that it is directed to a knowledge of the latter only on special occasions when the censor is unexpectedly surprised. Against this objection we may say that there are persons who are entirely conscious of their sleeping and dreaming, and who are apparently endowed with the conscious faculty of guiding their dream life. Such a dreamer, when dissatisfied with the course taken by the dream, breaks it off without awakening, and begins it anew in order to continue it with a different turn,

like the popular author who, on request, gives a happier ending to his play. Or, at another time, if placed by the dream in a sexually exciting situation, he thinks in his sleep: "I do not care to continue this dream and exhaust myself by a pollution; I prefer to defer it in favor of a real situation."

[Footnote 1](#): They share this character of indestructibility with all psychic acts that are really unconscious—that is, with psychic acts belonging to the system of the unconscious only. These paths are constantly open and never fall into disuse; they conduct the discharge of the exciting process as often as it becomes endowed with unconscious excitement. To speak metaphorically they suffer the same form of annihilation as the shades of the lower region in the *Odyssey*, who awoke to new life the moment they drank blood. The processes depending on the foreconscious system are destructible in a different way. The psychotherapy of the neuroses is based on this difference.

[Footnote 2](#): Le Lorrain justly extols the wish-fulfilment of the dream: "Sans fatigue sérieuse, sans être obligé de recourir à cette lutte opiniâtre et longue qui use et corrode les jouissances poursuivies."

[Footnote 3](#): This idea has been borrowed from *The Theory of Sleep* by Liébaux, who revived hypnotic investigation in our days. (*Du Sommeil provoqué*, etc.; Paris, 1889.)

VII

THE FUNCTION OF THE DREAM

Since we know that the foreconscious is suspended during the night by the wish to sleep, we can proceed to an intelligent investigation of the dream process. But let us first sum up the knowledge of this process already gained. We have shown that the waking activity leaves day remnants from which the sum of energy cannot be entirely removed; or the waking activity revives during the day one of the unconscious wishes; or both conditions occur simultaneously; we have already discovered the many variations that may take place. The unconscious wish has already made its way to the day remnants, either during the day or at any rate with the beginning of sleep, and has effected a transference to it. This produces a wish transferred to the recent material, or the suppressed recent wish comes to life again through a reinforcement from the unconscious. This wish now endeavors to make its way to consciousness on the normal path of the mental processes through the foreconscious, to which indeed it belongs through one of its constituent elements. It is confronted, however, by the censor, which is still active, and to the influence of which it now succumbs. It now takes on the distortion for which the way has already been paved by its transference to the recent material. Thus far it is in the way of becoming something resembling an obsession, delusion, or the like, *i.e.* a thought reinforced by a transference and distorted in expression by the censor. But its further progress is now checked through the dormant state of the foreconscious; this system has apparently protected itself against invasion by diminishing its excitements. The dream process, therefore, takes the regressive course, which has just been opened by the peculiarity of the sleeping state, and thereby follows the attraction exerted on it by the memory groups, which themselves exist in part only as visual energy not yet translated into terms of the later systems. On its way to regression the dream takes on the form of dramatization. The subject of compression will be discussed later. The dream process has now terminated the second part of its repeatedly impeded course. The first part expended itself progressively from the unconscious scenes or phantasies to the foreconscious, while the second part gravitates from the advent of the

sensor back to the perceptions. But when the dream process becomes a content of perception it has, so to speak, eluded the obstacle set up in the Forec. by the censor and by the sleeping state. It succeeds in drawing attention to itself and in being noticed by consciousness. For consciousness, which means to us a sensory organ for the reception of psychic qualities, may receive stimuli from two sources—first, from the periphery of the entire apparatus, viz. from the perception system, and, secondly, from the pleasure and pain stimuli, which constitute the sole psychic quality produced in the transformation of energy within the apparatus. All other processes in the system, even those in the foreconscious, are devoid of any psychic quality, and are therefore not objects of consciousness inasmuch as they do not furnish pleasure or pain for perception. We shall have to assume that those liberations of pleasure and pain automatically regulate the outlet of the occupation processes. But in order to make possible more delicate functions, it was later found necessary to render the course of the presentations more independent of the manifestations of pain. To accomplish this the Forec. system needed some qualities of its own which could attract consciousness, and most probably received them through the connection of the foreconscious processes with the memory system of the signs of speech, which is not devoid of qualities. Through the qualities of this system, consciousness, which had hitherto been a sensory organ only for the perceptions, now becomes also a sensory organ for a part of our mental processes. Thus we have now, as it were, two sensory surfaces, one directed to perceptions and the other to the foreconscious mental processes.

I must assume that the sensory surface of consciousness devoted to the Forec. is rendered less excitable by sleep than that directed to the P-systems. The giving up of interest for the nocturnal mental processes is indeed purposeful. Nothing is to disturb the mind; the Forec. wants to sleep. But once the dream becomes a perception, it is then capable of exciting consciousness through the qualities thus gained. The sensory stimulus accomplishes what it was really destined for, namely, it directs a part of the energy at the disposal of the Forec. in the form of attention upon the stimulant. We must, therefore, admit that the dream invariably awakens us, that is, it puts into activity a part of the dormant force of the Forec. This force imparts to the dream that influence which we have designated as secondary elaboration for the sake of connection and comprehensibility.

This means that the dream is treated by it like any other content of perception; it is subjected to the same ideas of expectation, as far at least as the material admits. As far as the direction is concerned in this third part of the dream, it may be said that here again the movement is progressive.

To avoid misunderstanding, it will not be amiss to say a few words about the temporal peculiarities of these dream processes. In a very interesting discussion, apparently suggested by Maury's puzzling guillotine dream, Goblet tries to demonstrate that the dream requires no other time than the transition period between sleeping and awakening. The awakening requires time, as the dream takes place during that period. One is inclined to believe that the final picture of the dream is so strong that it forces the dreamer to awaken; but, as a matter of fact, this picture is strong only because the dreamer is already very near awakening when it appears. "Un rêve c'est un réveil qui commence."

It has already been emphasized by Dugas that Goblet was forced to repudiate many facts in order to generalize his theory. There are, moreover, dreams from which we do not awaken, *e.g.*, some dreams in which we dream that we dream. From our knowledge of the dream-work, we can by no means admit that it extends only over the period of awakening. On the contrary, we must consider it probable that the first part of the dream-work begins during the day when we are still under the domination of the foreconscious. The second phase of the dream-work, *viz.* the modification through the censor, the attraction by the unconscious scenes, and the penetration to perception must continue throughout the night. And we are probably always right when we assert that we feel as though we had been dreaming the whole night, although we cannot say what. I do not, however, think it necessary to assume that, up to the time of becoming conscious, the dream processes really follow the temporal sequence which we have described, *viz.* that there is first the transferred dream-wish, then the distortion of the censor, and consequently the change of direction to regression, and so on. We were forced to form such a succession for the sake of *description*; in reality, however, it is much rather a matter of simultaneously trying this path and that, and of emotions fluctuating to and fro, until finally, owing to the most expedient distribution, one particular grouping is secured which remains. From certain personal experiences, I am

myself inclined to believe that the dream-work often requires more than one day and one night to produce its result; if this be true, the extraordinary art manifested in the construction of the dream loses all its marvels. In my opinion, even the regard for comprehensibility as an occurrence of perception may take effect before the dream attracts consciousness to itself. To be sure, from now on the process is accelerated, as the dream is henceforth subjected to the same treatment as any other perception. It is like fireworks, which require hours of preparation and only a moment for ignition.

Through the dream-work the dream process now gains either sufficient intensity to attract consciousness to itself and arouse the foreconscious, which is quite independent of the time or profundity of sleep, or, its intensity being insufficient it must wait until it meets the attention which is set in motion immediately before awakening. Most dreams seem to operate with relatively slight psychic intensities, for they wait for the awakening. This, however, explains the fact that we regularly perceive something dreamt on being suddenly aroused from a sound sleep. Here, as well as in spontaneous awakening, the first glance strikes the perception content created by the dream-work, while the next strikes the one produced from without.

But of greater theoretical interest are those dreams which are capable of waking us in the midst of sleep. We must bear in mind the expediency elsewhere universally demonstrated, and ask ourselves why the dream or the unconscious wish has the power to disturb sleep, *i.e.* the fulfillment of the foreconscious wish. This is probably due to certain relations of energy into which we have no insight. If we possessed such insight we should probably find that the freedom given to the dream and the expenditure of a certain amount of detached attention represent for the dream an economy in energy, keeping in view the fact that the unconscious must be held in check at night just as during the day. We know from experience that the dream, even if it interrupts sleep, repeatedly during the same night, still remains compatible with sleep. We wake up for an instant, and immediately resume our sleep. It is like driving off a fly during sleep, we awake *ad hoc*, and when we resume our sleep we have removed the disturbance. As demonstrated by familiar examples from the sleep of wet nurses, &c., the

fulfillment of the wish to sleep is quite compatible with the retention of a certain amount of attention in a given direction.

But we must here take cognizance of an objection that is based on a better knowledge of the unconscious processes. Although we have ourselves described the unconscious wishes as always active, we have, nevertheless, asserted that they are not sufficiently strong during the day to make themselves perceptible. But when we sleep, and the unconscious wish has shown its power to form a dream, and with it to awaken the foreconscious, why, then, does this power become exhausted after the dream has been taken cognizance of? Would it not seem more probable that the dream should continually renew itself, like the troublesome fly which, when driven away, takes pleasure in returning again and again? What justifies our assertion that the dream removes the disturbance of sleep?

That the unconscious wishes always remain active is quite true. They represent paths which are passable whenever a sum of excitement makes use of them. Moreover, a remarkable peculiarity of the unconscious processes is the fact that they remain indestructible. Nothing can be brought to an end in the unconscious; nothing can cease or be forgotten. This impression is most strongly gained in the study of the neuroses, especially of hysteria. The unconscious stream of thought which leads to the discharge through an attack becomes passable again as soon as there is an accumulation of a sufficient amount of excitement. The mortification brought on thirty years ago, after having gained access to the unconscious affective source, operates during all these thirty years like a recent one. Whenever its memory is touched, it is revived and shows itself to be supplied with the excitement which is discharged in a motor attack. It is just here that the office of psychotherapy begins, its task being to bring about adjustment and forgetfulness for the unconscious processes. Indeed, the fading of memories and the flagging of affects, which we are apt to take as self-evident and to explain as a primary influence of time on the psychic memories, are in reality secondary changes brought about by painstaking work. It is the foreconscious that accomplishes this work; and the only course to be pursued by psychotherapy is the subjugate the Unc, to the domination of the Forec.

There are, therefore, two exits for the individual unconscious emotional process. It is either left to itself, in which case it ultimately breaks through somewhere and secures for once a discharge for its excitation into motility; or it succumbs to the influence of the foreconscious, and its excitation becomes confined through this influence instead of being discharged. It is the latter process that occurs in the dream. Owing to the fact that it is directed by the conscious excitement, the energy from the Forec., which confronts the dream when grown to perception, restricts the unconscious excitement of the dream and renders it harmless as a disturbing factor. When the dreamer wakes up for a moment, he has actually chased away the fly that has threatened to disturb his sleep. We can now understand that it is really more expedient and economical to give full sway to the unconscious wish, and clear its way to regression so that it may form a dream, and then restrict and adjust this dream by means of a small expenditure of foreconscious labor, than to curb the unconscious throughout the entire period of sleep. We should, indeed, expect that the dream, even if it was not originally an expedient process, would have acquired some function in the play of forces of the psychic life. We now see what this function is. The dream has taken it upon itself to bring the liberated excitement of the Unc. back under the domination of the foreconscious; it thus affords relief for the excitement of the Unc. and acts as a safety-valve for the latter, and at the same time it insures the sleep of the foreconscious at a slight expenditure of the waking state. Like the other psychic formations of its group, the dream offers itself as a compromise serving simultaneously both systems by fulfilling both wishes in so far as they are compatible with each other. A glance at Robert's "elimination theory," will show that we must agree with this author in his main point, viz. in the determination of the function of the dream, though we differ from him in our hypotheses and in our treatment of the dream process.

The above qualification—in so far as the two wishes are compatible with each other—contains a suggestion that there may be cases in which the function of the dream suffers shipwreck. The dream process is in the first instance admitted as a wish-fulfillment of the unconscious, but if this tentative wish-fulfillment disturbs the foreconscious to such an extent that the latter can no longer maintain its rest, the dream then breaks the compromise and fails to perform the second part of its task. It is then at

once broken off, and replaced by complete wakefulness. Here, too, it is not really the fault of the dream, if, while ordinarily the guardian of sleep, it is here compelled to appear as the disturber of sleep, nor should this cause us to entertain any doubts as to its efficacy. This is not the only case in the organism in which an otherwise efficacious arrangement became inefficacious and disturbing as soon as some element is changed in the conditions of its origin; the disturbance then serves at least the new purpose of announcing the change, and calling into play against it the means of adjustment of the organism. In this connection, I naturally bear in mind the case of the anxiety dream, and in order not to have the appearance of trying to exclude this testimony against the theory of wish-fulfillment wherever I encounter it, I will attempt an explanation of the anxiety dream, at least offering some suggestions.

That a psychic process developing anxiety may still be a wish-fulfillment has long ceased to impress us as a contradiction. We may explain this occurrence by the fact that the wish belongs to one system (the Unc.), while by the other system (the Forec.), this wish has been rejected and suppressed. The subjection of the Unc. by the Forec. is not complete even in perfect psychic health; the amount of this suppression shows the degree of our psychic normality. Neurotic symptoms show that there is a conflict between the two systems; the symptoms are the results of a compromise of this conflict, and they temporarily put an end to it. On the one hand, they afford the Unc. an outlet for the discharge of its excitement, and serve it as a sally port, while, on the other hand, they give the Forec. the capability of dominating the Unc. to some extent. It is highly instructive to consider, *e.g.*, the significance of any hysterical phobia or of an agoraphobia. Suppose a neurotic incapable of crossing the street alone, which we would justly call a "symptom." We attempt to remove this symptom by urging him to the action which he deems himself incapable of. The result will be an attack of anxiety, just as an attack of anxiety in the street has often been the cause of establishing an agoraphobia. We thus learn that the symptom has been constituted in order to guard against the outbreak of the anxiety. The phobia is thrown before the anxiety like a fortress on the frontier.

Unless we enter into the part played by the affects in these processes, which can be done here only imperfectly, we cannot continue our discussion. Let

us therefore advance the proposition that the reason why the suppression of the unconscious becomes absolutely necessary is because, if the discharge of presentation should be left to itself, it would develop an affect in the Unc. which originally bore the character of pleasure, but which, since the appearance of the repression, bears the character of pain. The aim, as well as the result, of the suppression is to stop the development of this pain. The suppression extends over the unconscious ideation, because the liberation of pain might emanate from the ideation. The foundation is here laid for a very definite assumption concerning the nature of the affective development. It is regarded as a motor or secondary activity, the key to the innervation of which is located in the presentations of the Unc. Through the domination of the Forec. these presentations become, as it were, throttled and inhibited at the exit of the emotion-developing impulses. The danger, which is due to the fact that the Forec. ceases to occupy the energy, therefore consists in the fact that the unconscious excitations liberate such an affect as—in consequence of the repression that has previously taken place—can only be perceived as pain or anxiety.

This danger is released through the full sway of the dream process. The determinations for its realization consist in the fact that repressions have taken place, and that the suppressed emotional wishes shall become sufficiently strong. They thus stand entirely without the psychological realm of the dream structure. Were it not for the fact that our subject is connected through just one factor, namely, the freeing of the Unc. during sleep, with the subject of the development of anxiety, I could dispense with discussion of the anxiety dream, and thus avoid all obscurities connected with it.

As I have often repeated, the theory of the anxiety belongs to the psychology of the neuroses. I would say that the anxiety in the dream is an anxiety problem and not a dream problem. We have nothing further to do with it after having once demonstrated its point of contact with the subject of the dream process. There is only one thing left for me to do. As I have asserted that the neurotic anxiety originates from sexual sources, I can subject anxiety dreams to analysis in order to demonstrate the sexual material in their dream thoughts.

For good reasons I refrain from citing here any of the numerous examples placed at my disposal by neurotic patients, but prefer to give anxiety dreams from young persons.

Personally, I have had no real anxiety dream for decades, but I recall one from my seventh or eighth year which I subjected to interpretation about thirty years later. The dream was very vivid, and showed me *my beloved mother, with peculiarly calm sleeping countenance, carried into the room and laid on the bed by two (or three) persons with birds' beaks*. I awoke crying and screaming, and disturbed my parents. The very tall figures—draped in a peculiar manner—with beaks, I had taken from the illustrations of Philippon's bible; I believe they represented deities with heads of sparrowhawks from an Egyptian tomb relief. The analysis also introduced the reminiscence of a naughty janitor's boy, who used to play with us children on the meadow in front of the house; I would add that his name was Philip. I feel that I first heard from this boy the vulgar word signifying sexual intercourse, which is replaced among the educated by the Latin "coitus," but to which the dream distinctly alludes by the selection of the birds' heads. I must have suspected the sexual significance of the word from the facial expression of my worldly-wise teacher. My mother's features in the dream were copied from the countenance of my grandfather, whom I had seen a few days before his death snoring in the state of coma. The interpretation of the secondary elaboration in the dream must therefore have been that my mother was dying; the tomb relief, too, agrees with this. In this anxiety I awoke, and could not calm myself until I had awakened my parents. I remember that I suddenly became calm on coming face to face with my mother, as if I needed the assurance that my mother was not dead. But this secondary interpretation of the dream had been effected only under the influence of the developed anxiety. I was not frightened because I dreamed that my mother was dying, but I interpreted the dream in this manner in the foreconscious elaboration because I was already under the domination of the anxiety. The latter, however, could be traced by means of the repression to an obscure obviously sexual desire, which had found its satisfying expression in the visual content of the dream.

A man twenty-seven years old who had been severely ill for a year had had many terrifying dreams between the ages of eleven and thirteen. He thought

that a man with an ax was running after him; he wished to run, but felt paralyzed and could not move from the spot. This may be taken as a good example of a very common, and apparently sexually indifferent, anxiety dream. In the analysis the dreamer first thought of a story told him by his uncle, which chronologically was later than the dream, viz. that he was attacked at night by a suspicious-looking individual. This occurrence led him to believe that he himself might have already heard of a similar episode at the time of the dream. In connection with the ax he recalled that during that period of his life he once hurt his hand with an ax while chopping wood. This immediately led to his relations with his younger brother, whom he used to maltreat and knock down. In particular, he recalled an occasion when he struck his brother on the head with his boot until he bled, whereupon his mother remarked: "I fear he will kill him some day." While he was seemingly thinking of the subject of violence, a reminiscence from his ninth year suddenly occurred to him. His parents came home late and went to bed while he was feigning sleep. He soon heard panting and other noises that appeared strange to him, and he could also make out the position of his parents in bed. His further associations showed that he had established an analogy between this relation between his parents and his own relation toward his younger brother. He subsumed what occurred between his parents under the conception "violence and wrestling," and thus reached a sadistic conception of the coitus act, as often happens among children. The fact that he often noticed blood on his mother's bed corroborated his conception.

That the sexual intercourse of adults appears strange to children who observe it, and arouses fear in them, I dare say is a fact of daily experience. I have explained this fear by the fact that sexual excitement is not mastered by their understanding, and is probably also unacceptable to them because their parents are involved in it. For the same son this excitement is converted into fear. At a still earlier period of life sexual emotion directed toward the parent of opposite sex does not meet with repression but finds free expression, as we have seen before.

For the night terrors with hallucinations (*pavor nocturnus*) frequently found in children, I would unhesitatingly give the same explanation. Here, too, we are certainly dealing with the incomprehensible and rejected sexual

feelings, which, if noted, would probably show a temporal periodicity, for an enhancement of the sexual *libido* may just as well be produced accidentally through emotional impressions as through the spontaneous and gradual processes of development.

I lack the necessary material to sustain these explanations from observation. On the other hand, the pediatricists seem to lack the point of view which alone makes comprehensible the whole series of phenomena, on the somatic as well as on the psychic side. To illustrate by a comical example how one wearing the blinders of medical mythology may miss the understanding of such cases I will relate a case which I found in a thesis on *pavor nocturnus* by *Debacker*, 1881. A thirteen-year-old boy of delicate health began to become anxious and dreamy; his sleep became restless, and about once a week it was interrupted by an acute attack of anxiety with hallucinations. The memory of these dreams was invariably very distinct. Thus, he related that the *devil* shouted at him: "Now we have you, now we have you," and this was followed by an odor of sulphur; the fire burned his skin. This dream aroused him, terror-stricken. He was unable to scream at first; then his voice returned, and he was heard to say distinctly: "No, no, not me; why, I have done nothing," or, "Please don't, I shall never do it again." Occasionally, also, he said: "Albert has not done that." Later he avoided undressing, because, as he said, the fire attacked him only when he was undressed. From amid these evil dreams, which menaced his health, he was sent into the country, where he recovered within a year and a half, but at the age of fifteen he once confessed: "Je n'osais pas l'avouer, mais j'éprouvais continuellement des picotements et des surexcitations aux *parties*; à la fin, cela m'énervait tant que plusieurs fois, j'ai pensé me jeter par la fenêtre au dortoir."

It is certainly not difficult to suspect: 1, that the boy had practiced masturbation in former years, that he probably denied it, and was threatened with severe punishment for his wrongdoing (his confession: *Je ne le ferai plus*; his denial: *Albert n'a jamais fait ça*). 2, That under the pressure of puberty the temptation to self-abuse through the tickling of the genitals was reawakened. 3, That now, however, a struggle of repression arose in him, suppressing the *libido* and changing it into fear, which subsequently took the form of the punishments with which he was then threatened.

Let us, however, quote the conclusions drawn by our author. This observation shows: 1, That the influence of puberty may produce in a boy of delicate health a condition of extreme weakness, and that it may lead to a *very marked cerebral anæmia*.

2. This cerebral anæmia produces a transformation of character, demonomaniacal hallucinations, and very violent nocturnal, perhaps also diurnal, states of anxiety.

3. Demonomania and the self-reproaches of the day can be traced to the influences of religious education which the subject underwent as a child.

4. All manifestations disappeared as a result of a lengthy sojourn in the country, bodily exercise, and the return of physical strength after the termination of the period of puberty.

5. A predisposing influence for the origin of the cerebral condition of the boy may be attributed to heredity and to the father's chronic syphilitic state.

The concluding remarks of the author read: "Nous avons fait entrer cette observation dans le cadre des délires apyrétiques d'inanition, car c'est à l'ischémie cérébrale que nous rattachons cet état particulier."

VIII

THE PRIMARY AND SECONDARY PROCESS —REGRESSION

In venturing to attempt to penetrate more deeply into the psychology of the dream processes, I have undertaken a difficult task, to which, indeed, my power of description is hardly equal. To reproduce in description by a succession of words the simultaneousness of so complex a chain of events, and in doing so to appear unbiassed throughout the exposition, goes fairly beyond my powers. I have now to atone for the fact that I have been unable in my description of the dream psychology to follow the historic development of my views. The view-points for my conception of the dream were reached through earlier investigations in the psychology of the neuroses, to which I am not supposed to refer here, but to which I am repeatedly forced to refer, whereas I should prefer to proceed in the opposite direction, and, starting from the dream, to establish a connection with the psychology of the neuroses. I am well aware of all the inconveniences arising for the reader from this difficulty, but I know of no way to avoid them.

As I am dissatisfied with this state of affairs, I am glad to dwell upon another view-point which seems to raise the value of my efforts. As has been shown in the introduction to the first chapter, I found myself confronted with a theme which had been marked by the sharpest contradictions on the part of the authorities. After our elaboration of the dream problems we found room for most of these contradictions. We have been forced, however, to take decided exception to two of the views pronounced, viz. that the dream is a senseless and that it is a somatic process; apart from these cases we have had to accept all the contradictory views in one place or another of the complicated argument, and we have been able to demonstrate that they had discovered something that was correct. That the dream continues the impulses and interests of the waking state has been quite generally confirmed through the discovery of the latent thoughts of the dream. These thoughts concern themselves only with things

that seem important and of momentous interest to us. The dream never occupies itself with trifles. But we have also concurred with the contrary view, viz., that the dream gathers up the indifferent remnants from the day, and that not until it has in some measure withdrawn itself from the waking activity can an important event of the day be taken up by the dream. We found this holding true for the dream content, which gives the dream thought its changed expression by means of disfigurement. We have said that from the nature of the association mechanism the dream process more easily takes possession of recent or indifferent material which has not yet been seized by the waking mental activity; and by reason of the censor it transfers the psychic intensity from the important but also disagreeable to the indifferent material. The hypermnesia of the dream and the resort to infantile material have become main supports in our theory. In our theory of the dream we have attributed to the wish originating from the infantile the part of an indispensable motor for the formation of the dream. We naturally could not think of doubting the experimentally demonstrated significance of the objective sensory stimuli during sleep; but we have brought this material into the same relation to the dream-wish as the thought remnants from the waking activity. There was no need of disputing the fact that the dream interprets the objective sensory stimuli after the manner of an illusion; but we have supplied the motive for this interpretation which has been left undecided by the authorities. The interpretation follows in such a manner that the perceived object is rendered harmless as a sleep disturber and becomes available for the wish-fulfillment. Though we do not admit as special sources of the dream the subjective state of excitement of the sensory organs during sleep, which seems to have been demonstrated by Trumbull Ladd, we are nevertheless able to explain this excitement through the regressive revival of active memories behind the dream. A modest part in our conception has also been assigned to the inner organic sensations which are wont to be taken as the cardinal point in the explanation of the dream. These—the sensation of falling, flying, or inhibition—stand as an ever ready material to be used by the dream-work to express the dream thought as often as need arises.

That the dream process is a rapid and momentary one seems to be true for the perception through consciousness of the already prepared dream content; the preceding parts of the dream process probably take a slow,

fluctuating course. We have solved the riddle of the superabundant dream content compressed within the briefest moment by explaining that this is due to the appropriation of almost fully formed structures from the psychic life. That the dream is disfigured and distorted by memory we found to be correct, but not troublesome, as this is only the last manifest operation in the work of disfigurement which has been active from the beginning of the dream-work. In the bitter and seemingly irreconcilable controversy as to whether the psychic life sleeps at night or can make the same use of all its capabilities as during the day, we have been able to agree with both sides, though not fully with either. We have found proof that the dream thoughts represent a most complicated intellectual activity, employing almost every means furnished by the psychic apparatus; still it cannot be denied that these dream thoughts have originated during the day, and it is indispensable to assume that there is a sleeping state of the psychic life. Thus, even the theory of partial sleep has come into play; but the characteristics of the sleeping state have been found not in the dilapidation of the psychic connections but in the cessation of the psychic system dominating the day, arising from its desire to sleep. The withdrawal from the outer world retains its significance also for our conception; though not the only factor, it nevertheless helps the regression to make possible the representation of the dream. That we should reject the voluntary guidance of the presentation course is uncontestable; but the psychic life does not thereby become aimless, for we have seen that after the abandonment of the desired end-presentation undesired ones gain the mastery. The loose associative connection in the dream we have not only recognized, but we have placed under its control a far greater territory than could have been supposed; we have, however, found it merely the feigned substitute for another correct and senseful one. To be sure we, too, have called the dream absurd; but we have been able to learn from examples how wise the dream really is when it simulates absurdity. We do not deny any of the functions that have been attributed to the dream. That the dream relieves the mind like a valve, and that, according to Robert's assertion, all kinds of harmful material are rendered harmless through representation in the dream, not only exactly coincides with our theory of the twofold wish-fulfillment in the dream, but, in his own wording, becomes even more comprehensible for us than for Robert himself. The free indulgence of the psychic in the play of its faculties finds expression with us in the non-interference with the dream on

the part of the foreconscious activity. The "return to the embryonal state of psychic life in the dream" and the observation of Havelock Ellis, "an archaic world of vast emotions and imperfect thoughts," appear to us as happy anticipations of our deductions to the effect that *primitive* modes of work suppressed during the day participate in the formation of the dream; and with us, as with Delage, the *suppressed* material becomes the mainspring of the dreaming.

We have fully recognized the rôle which Scherner ascribes to the dream phantasy, and even his interpretation; but we have been obliged, so to speak, to conduct them to another department in the problem. It is not the dream that produces the phantasy but the unconscious phantasy that takes the greatest part in the formation of the dream thoughts. We are indebted to Scherner for his clew to the source of the dream thoughts, but almost everything that he ascribes to the dream-work is attributable to the activity of the unconscious, which is at work during the day, and which supplies incitements not only for dreams but for neurotic symptoms as well. We have had to separate the dream-work from this activity as being something entirely different and far more restricted. Finally, we have by no means abandoned the relation of the dream to mental disturbances, but, on the contrary, we have given it a more solid foundation on new ground.

Thus held together by the new material of our theory as by a superior unity, we find the most varied and most contradictory conclusions of the authorities fitting into our structure; some of them are differently disposed, only a few of them are entirely rejected. But our own structure is still unfinished. For, disregarding the many obscurities which we have necessarily encountered in our advance into the darkness of psychology, we are now apparently embarrassed by a new contradiction. On the one hand, we have allowed the dream thoughts to proceed from perfectly normal mental operations, while, on the other hand, we have found among the dream thoughts a number of entirely abnormal mental processes which extend likewise to the dream contents. These, consequently, we have repeated in the interpretation of the dream. All that we have termed the "dream-work" seems so remote from the psychic processes recognized by us as correct, that the severest judgments of the authors as to the low psychic activity of dreaming seem to us well founded.

Perhaps only through still further advance can enlightenment and improvement be brought about. I shall pick out one of the constellations leading to the formation of dreams.

We have learned that the dream replaces a number of thoughts derived from daily life which are perfectly formed logically. We cannot therefore doubt that these thoughts originate from our normal mental life. All the qualities which we esteem in our mental operations, and which distinguish these as complicated activities of a high order, we find repeated in the dream thoughts. There is, however, no need of assuming that this mental work is performed during sleep, as this would materially impair the conception of the psychic state of sleep we have hitherto adhered to. These thoughts may just as well have originated from the day, and, unnoticed by our consciousness from their inception, they may have continued to develop until they stood complete at the onset of sleep. If we are to conclude anything from this state of affairs, it will at most prove *that the most complex mental operations are possible without the coöperation of consciousness*, which we have already learned independently from every psychoanalysis of persons suffering from hysteria or obsessions. These dream thoughts are in themselves surely not incapable of consciousness; if they have not become conscious to us during the day, this may have various reasons. The state of becoming conscious depends on the exercise of a certain psychic function, viz. attention, which seems to be extended only in a definite quantity, and which may have been withdrawn from the stream of thought in Question by other aims. Another way in which such mental streams are kept from consciousness is the following:—Our conscious reflection teaches us that when exercising attention we pursue a definite course. But if that course leads us to an idea which does not hold its own with the critic, we discontinue and cease to apply our attention. Now, apparently, the stream of thought thus started and abandoned may spin on without regaining attention unless it reaches a spot of especially marked intensity which forces the return of attention. An initial rejection, perhaps consciously brought about by the judgment on the ground of incorrectness or unfitness for the actual purpose of the mental act, may therefore account for the fact that a mental process continues until the onset of sleep unnoticed by consciousness.

Let us recapitulate by saying that we call such a stream of thought a foreconscious one, that we believe it to be perfectly correct, and that it may just as well be a more neglected one or an interrupted and suppressed one. Let us also state frankly in what manner we conceive this presentation course. We believe that a certain sum of excitement, which we call occupation energy, is displaced from an end-presentation along the association paths selected by that end-presentation. A "neglected" stream of thought has received no such occupation, and from a "suppressed" or "rejected" one this occupation has been withdrawn; both have thus been left to their own emotions. The end-stream of thought stocked with energy is under certain conditions able to draw to itself the attention of consciousness, through which means it then receives a "surplus of energy." We shall be obliged somewhat later to elucidate our assumption concerning the nature and activity of consciousness.

A train of thought thus incited in the Forec. may either disappear spontaneously or continue. The former issue we conceive as follows: It diffuses its energy through all the association paths emanating from it, and throws the entire chain of ideas into a state of excitement which, after lasting for a while, subsides through the transformation of the excitement requiring an outlet into dormant energy.¹ If this first issue is brought about the process has no further significance for the dream formation. But other end-presentations are lurking in our foreconscious that originate from the sources of our unconscious and from the ever active wishes. These may take possession of the excitations in the circle of thought thus left to itself, establish a connection between it and the unconscious wish, and transfer to it the energy inherent in the unconscious wish. Henceforth the neglected or suppressed train of thought is in a position to maintain itself, although this reinforcement does not help it to gain access to consciousness. We may say that the hitherto foreconscious train of thought has been drawn into the unconscious.

Other constellations for the dream formation would result if the foreconscious train of thought had from the beginning been connected with the unconscious wish, and for that reason met with rejection by the dominating end-occupation; or if an unconscious wish were made active for other—possibly somatic—reasons and of its own accord sought a

transference to the psychic remnants not occupied by the Forec. All three cases finally combine in one issue, so that there is established in the foreconscious a stream of thought which, having been abandoned by the foreconscious occupation, receives occupation from the unconscious wish.

The stream of thought is henceforth subjected to a series of transformations which we no longer recognize as normal psychic processes and which give us a surprising result, viz. a psychopathological formation. Let us emphasize and group the same.

1. The intensities of the individual ideas become capable of discharge in their entirety, and, proceeding from one conception to the other, they thus form single presentations endowed with marked intensity. Through the repeated recurrence of this process the intensity of an entire train of ideas may ultimately be gathered in a single presentation element. This is the principle of *compression or condensation*. It is condensation that is mainly responsible for the strange impression of the dream, for we know of nothing analogous to it in the normal psychic life accessible to consciousness. We find here, also, presentations which possess great psychic significance as junctions or as end-results of whole chains of thought; but this validity does not manifest itself in any character conspicuous enough for internal perception; hence, what has been presented in it does not become in any way more intensive. In the process of condensation the entire psychic connection becomes transformed into the intensity of the presentation content. It is the same as in a book where we space or print in heavy type any word upon which particular stress is laid for the understanding of the text. In speech the same word would be pronounced loudly and deliberately and with emphasis. The first comparison leads us at once to an example taken from the chapter on "The Dream-Work" (trimethylamine in the dream of Irma's injection). Historians of art call our attention to the fact that the most ancient historical sculptures follow a similar principle in expressing the rank of the persons represented by the size of the statue. The king is made two or three times as large as his retinue or the vanquished enemy. A piece of art, however, from the Roman period makes use of more subtle means to accomplish the same purpose. The figure of the emperor is placed in the center in a firmly erect posture; special care is bestowed on the proper modelling of his figure; his enemies are seen cowering at his feet;

but he is no longer represented a giant among dwarfs. However, the bowing of the subordinate to his superior in our own days is only an echo of that ancient principle of representation.

The direction taken by the condensations of the dream is prescribed on the one hand by the true foreconscious relations of the dream thoughts, and on the other hand by the attraction of the visual reminiscences in the unconscious. The success of the condensation work produces those intensities which are required for penetration into the perception systems.

2. Through this free transferability of the intensities, moreover, and in the service of condensation, *intermediary presentations*—compromises, as it were—are formed (*cf.* the numerous examples). This, likewise, is something unheard of in the normal presentation course, where it is above all a question of selection and retention of the "proper" presentation element. On the other hand, composite and compromise formations occur with extraordinary frequency when we are trying to find the linguistic expression for foreconscious thoughts; these are considered "slips of the tongue."

3. The presentations which transfer their intensities to one another are *very loosely connected*, and are joined together by such forms of association as are spurned in our serious thought and are utilized in the production of the effect of wit only. Among these we particularly find associations of the sound and consonance types.

4. Contradictory thoughts do not strive to eliminate one another, but remain side by side. They often unite to produce condensation *as if no contradiction* existed, or they form compromises for which we should never forgive our thoughts, but which we frequently approve of in our actions.

These are some of the most conspicuous abnormal processes to which the thoughts which have previously been rationally formed are subjected in the course of the dream-work. As the main feature of these processes we recognize the high importance attached to the fact of rendering the occupation energy mobile and capable of discharge; the content and the actual significance of the psychic elements, to which these energies adhere, become a matter of secondary importance. One might possibly think that

the condensation and compromise formation is effected only in the service of regression, when occasion arises for changing thoughts into pictures. But the analysis and—still more distinctly—the synthesis of dreams which lack regression toward pictures, *e.g.* the dream "Autodidasker—Conversation with Court-Councilor N.," present the same processes of displacement and condensation as the others.

Hence we cannot refuse to acknowledge that the two kinds of essentially different psychic processes participate in the formation of the dream; one forms perfectly correct dream thoughts which are equivalent to normal thoughts, while the other treats these ideas in a highly surprising and incorrect manner. The latter process we have already set apart as the dream-work proper. What have we now to advance concerning this latter psychic process?

We should be unable to answer this question here if we had not penetrated considerably into the psychology of the neuroses and especially of hysteria. From this we learn that the same incorrect psychic processes—as well as others that have not been enumerated—control the formation of hysterical symptoms. In hysteria, too, we at once find a series of perfectly correct thoughts equivalent to our conscious thoughts, of whose existence, however, in this form we can learn nothing and which we can only subsequently reconstruct. If they have forced their way anywhere to our perception, we discover from the analysis of the symptom formed that these normal thoughts have been subjected to abnormal treatment and *have been transformed into the symptom by means of condensation and compromise formation, through superficial associations, under cover of contradictions, and eventually over the road of regression.* In view of the complete identity found between the peculiarities of the dream-work and of the psychic activity forming the psychoneurotic symptoms, we shall feel justified in transferring to the dream the conclusions urged upon us by hysteria.

From the theory of hysteria we borrow the proposition that *such an abnormal psychic elaboration of a normal train of thought takes place only when the latter has been used for the transference of an unconscious wish which dates from the infantile life and is in a state of repression.* In accordance with this proposition we have construed the theory of the dream

on the assumption that the actuating dream-wish invariably originates in the unconscious, which, as we ourselves have admitted, cannot be universally demonstrated though it cannot be refuted. But in order to explain the real meaning of the term *repression*, which we have employed so freely, we shall be obliged to make some further addition to our psychological construction.

We have above elaborated the fiction of a primitive psychic apparatus, whose work is regulated by the efforts to avoid accumulation of excitement and as far as possible to maintain itself free from excitement. For this reason it was constructed after the plan of a reflex apparatus; the motility, originally the path for the inner bodily change, formed a discharging path standing at its disposal. We subsequently discussed the psychic results of a feeling of gratification, and we might at the same time have introduced the second assumption, viz. that accumulation of excitement—following certain modalities that do not concern us—is perceived as pain and sets the apparatus in motion in order to reproduce a feeling of gratification in which the diminution of the excitement is perceived as pleasure. Such a current in the apparatus which emanates from pain and strives for pleasure we call a wish. We have said that nothing but a wish is capable of setting the apparatus in motion, and that the discharge of excitement in the apparatus is regulated automatically by the perception of pleasure and pain. The first wish must have been an hallucinatory occupation of the memory for gratification. But this hallucination, unless it were maintained to the point of exhaustion, proved incapable of bringing about a cessation of the desire and consequently of securing the pleasure connected with gratification.

Thus there was required a second activity—in our terminology the activity of a second system—which should not permit the memory occupation to advance to perception and therefrom to restrict the psychic forces, but should lead the excitement emanating from the craving stimulus by a devious path over the spontaneous motility which ultimately should so change the outer world as to allow the real perception of the object of gratification to take place. Thus far we have elaborated the plan of the psychic apparatus; these two systems are the germ of the Unc. and Forec, which we include in the fully developed apparatus.

In order to be in a position successfully to change the outer world through the motility, there is required the accumulation of a large sum of experiences in the memory systems as well as a manifold fixation of the relations which are evoked in this memory material by different end-presentations. We now proceed further with our assumption. The manifold activity of the second system, tentatively sending forth and retracting energy, must on the one hand have full command over all memory material, but on the other hand it would be a superfluous expenditure for it to send to the individual mental paths large quantities of energy which would thus flow off to no purpose, diminishing the quantity available for the transformation of the outer world. In the interests of expediency I therefore postulate that the second system succeeds in maintaining the greater part of the occupation energy in a dormant state and in using but a small portion for the purposes of displacement. The mechanism of these processes is entirely unknown to me; any one who wishes to follow up these ideas must try to find the physical analogies and prepare the way for a demonstration of the process of motion in the stimulation of the neuron. I merely hold to the idea that the activity of the first Ψ -system is directed *to the free outflow of the quantities of excitement*, and that the second system brings about an inhibition of this outflow through the energies emanating from it, *i.e.* it produces a *transformation into dormant energy, probably by raising the level*. I therefore assume that under the control of the second system as compared with the first, the course of the excitement is bound to entirely different mechanical conditions. After the second system has finished its tentative mental work, it removes the inhibition and congestion of the excitements and allows these excitements to flow off to the motility.

An interesting train of thought now presents itself if we consider the relations of this inhibition of discharge by the second system to the regulation through the principle of pain. Let us now seek the counterpart of the primary feeling of gratification, namely, the objective feeling of fear. A perceptive stimulus acts on the primitive apparatus, becoming the source of a painful emotion. This will then be followed by irregular motor manifestations until one of these withdraws the apparatus from perception and at the same time from pain, but on the reappearance of the perception this manifestation will immediately repeat itself (perhaps as a movement of flight) until the perception has again disappeared. But there will here

remain no tendency again to occupy the perception of the source of pain in the form of an hallucination or in any other form. On the contrary, there will be a tendency in the primary apparatus to abandon the painful memory picture as soon as it is in any way awakened, as the overflow of its excitement would surely produce (more precisely, begin to produce) pain. The deviation from memory, which is but a repetition of the former flight from perception, is facilitated also by the fact that, unlike perception, memory does not possess sufficient quality to excite consciousness and thereby to attract to itself new energy. This easy and regularly occurring deviation of the psychic process from the former painful memory presents to us the model and the first example of *psychic repression*. As is generally known, much of this deviation from the painful, much of the behavior of the ostrich, can be readily demonstrated even in the normal psychic life of adults.

By virtue of the principle of pain the first system is therefore altogether incapable of introducing anything unpleasant into the mental associations. The system cannot do anything but wish. If this remained so the mental activity of the second system, which should have at its disposal all the memories stored up by experiences, would be hindered. But two ways are now opened: the work of the second system either frees itself completely from the principle of pain and continues its course, paying no heed to the painful reminiscence, or it contrives to occupy the painful memory in such a manner as to preclude the liberation of pain. We may reject the first possibility, as the principle of pain also manifests itself as a regulator for the emotional discharge of the second system; we are, therefore, directed to the second possibility, namely, that this system occupies a reminiscence in such a manner as to inhibit its discharge and hence, also, to inhibit the discharge comparable to a motor innervation for the development of pain. Thus from two starting points we are led to the hypothesis that occupation through the second system is at the same time an inhibition for the emotional discharge, viz. from a consideration of the principle of pain and from the principle of the smallest expenditure of innervation. Let us, however, keep to the fact—this is the key to the theory of repression—that the second system is capable of occupying an idea only when it is in position to check the development of pain emanating from it. Whatever withdraws itself from this inhibition also remains inaccessible for the second system and would soon be

abandoned by virtue of the principle of pain. The inhibition of pain, however, need not be complete; it must be permitted to begin, as it indicates to the second system the nature of the memory and possibly its defective adaptation for the purpose sought by the mind.

The psychic process which is admitted by the first system only I shall now call the *primary* process; and the one resulting from the inhibition of the second system I shall call the *secondary* process. I show by another point for what purpose the second system is obliged to correct the primary process. The primary process strives for a discharge of the excitement in order to establish a *perception* identity with the sum of excitement thus gathered; the secondary process has abandoned this intention and undertaken instead the task of bringing about a *thought identity*. All thinking is only a circuitous path from the memory of gratification taken as an end-presentation to the identical occupation of the same memory, which is again to be attained on the track of the motor experiences. The state of thinking must take an interest in the connecting paths between the presentations without allowing itself to be misled by their intensities. But it is obvious that condensations and intermediate or compromise formations occurring in the presentations impede the attainment of this end-identity; by substituting one idea for the other they deviate from the path which otherwise would have been continued from the original idea. Such processes are therefore carefully avoided in the secondary thinking. Nor is it difficult to understand that the principle of pain also impedes the progress of the mental stream in its pursuit of the thought identity, though, indeed, it offers to the mental stream the most important points of departure. Hence the tendency of the thinking process must be to free itself more and more from exclusive adjustment by the principle of pain, and through the working of the mind to restrict the affective development to that minimum which is necessary as a signal. This refinement of the activity must have been attained through a recent over-occupation of energy brought about by consciousness. But we are aware that this refinement is seldom completely successful even in the most normal psychic life and that our thoughts ever remain accessible to falsification through the interference of the principle of pain.

This, however, is not the breach in the functional efficiency of our psychic apparatus through which the thoughts forming the material of the secondary mental work are enabled to make their way into the primary psychic process—with which formula we may now describe the work leading to the dream and to the hysterical symptoms. This case of insufficiency results from the union of the two factors from the history of our evolution; one of which belongs solely to the psychic apparatus and has exerted a determining influence on the relation of the two systems, while the other operates fluctuatingly and introduces motive forces of organic origin into the psychic life. Both originate in the infantile life and result from the transformation which our psychic and somatic organism has undergone since the infantile period.

When I termed one of the psychic processes in the psychic apparatus the primary process, I did so not only in consideration of the order of precedence and capability, but also as admitting the temporal relations to a share in the nomenclature. As far as our knowledge goes there is no psychic apparatus possessing only the primary process, and in so far it is a theoretic fiction; but so much is based on fact that the primary processes are present in the apparatus from the beginning, while the secondary processes develop gradually in the course of life, inhibiting and covering the primary ones, and gaining complete mastery over them perhaps only at the height of life. Owing to this retarded appearance of the secondary processes, the essence of our being, consisting in unconscious wish feelings, can neither be seized nor inhibited by the foreconscious, whose part is once for all restricted to the indication of the most suitable paths for the wish feelings originating in the unconscious. These unconscious wishes establish for all subsequent psychic efforts a compulsion to which they have to submit and which they must strive if possible to divert from its course and direct to higher aims. In consequence of this retardation of the foreconscious occupation a large sphere of the memory material remains inaccessible.

Among these indestructible and unincumbered wish feelings originating from the infantile life, there are also some, the fulfillments of which have entered into a relation of contradiction to the end-presentation of the secondary thinking. The fulfillment of these wishes would no longer produce an affect of pleasure but one of pain; *and it is just this*

transformation of affect that constitutes the nature of what we designate as "repression," in which we recognize the infantile first step of passing adverse sentence or of rejecting through reason. To investigate in what way and through what motive forces such a transformation can be produced constitutes the problem of repression, which we need here only skim over. It will suffice to remark that such a transformation of affect occurs in the course of development (one may think of the appearance in infantile life of disgust which was originally absent), and that it is connected with the activity of the secondary system. The memories from which the unconscious wish brings about the emotional discharge have never been accessible to the Forec., and for that reason their emotional discharge cannot be inhibited. It is just on account of this affective development that these ideas are not even now accessible to the foreconscious thoughts to which they have transferred their wishing power. On the contrary, the principle of pain comes into play, and causes the Forec. to deviate from these thoughts of transference. The latter, left to themselves, are "repressed," and thus the existence of a store of infantile memories, from the very beginning withdrawn from the Forec., becomes the preliminary condition of repression.

In the most favorable case the development of pain terminates as soon as the energy has been withdrawn from the thoughts of transference in the Forec., and this effect characterizes the intervention of the principle of pain as expedient. It is different, however, if the repressed unconscious wish receives an organic enforcement which it can lend to its thoughts of transference and through which it can enable them to make an effort towards penetration with their excitement, even after they have been abandoned by the occupation of the Forec. A defensive struggle then ensues, inasmuch as the Forec. reinforces the antagonism against the repressed ideas, and subsequently this leads to a penetration by the thoughts of transference (the carriers of the unconscious wish) in some form of compromise through symptom formation. But from the moment that the suppressed thoughts are powerfully occupied by the unconscious wish-feeling and abandoned by the foreconscious occupation, they succumb to the primary psychic process and strive only for motor discharge; or, if the path be free, for hallucinatory revival of the desired perception identity. We have previously found, empirically, that the incorrect processes described

are enacted only with thoughts that exist in the repression. We now grasp another part of the connection. These incorrect processes are those that are primary in the psychic apparatus; *they appear wherever thoughts abandoned by the foreconscious occupation are left to themselves, and can fill themselves with the uninhibited energy, striving for discharge from the unconscious.* We may add a few further observations to support the view that these processes designated "incorrect" are really not falsifications of the normal defective thinking, but the modes of activity of the psychic apparatus when freed from inhibition. Thus we see that the transference of the foreconscious excitement to the motility takes place according to the same processes, and that the connection of the foreconscious presentations with words readily manifest the same displacements and mixtures which are ascribed to inattention. Finally, I should like to adduce proof that an increase of work necessarily results from the inhibition of these primary courses from the fact that we gain a *comical effect*, a surplus to be discharged through laughter, *if we allow these streams of thought to come to consciousness.*

The theory of the psychoneuroses asserts with complete certainty that only sexual wish-feelings from the infantile life experience repression (emotional transformation) during the developmental period of childhood. These are capable of returning to activity at a later period of development, and then have the faculty of being revived, either as a consequence of the sexual constitution, which is really formed from the original bisexuality, or in consequence of unfavorable influences of the sexual life; and they thus supply the motive power for all psychoneurotic symptom formations. It is only by the introduction of these sexual forces that the gaps still demonstrable in the theory of repression can be filled. I will leave it undecided whether the postulate of the sexual and infantile may also be asserted for the theory of the dream; I leave this here unfinished because I have already passed a step beyond the demonstrable in assuming that the dream-wish invariably originates from the unconscious.² Nor will I further investigate the difference in the play of the psychic forces in the dream formation and in the formation of the hysterical symptoms, for to do this we ought to possess a more explicit knowledge of one of the members to be compared. But I regard another point as important, and will here confess that it was on account of this very point that I have just undertaken this

entire discussion concerning the two psychic systems, their modes of operation, and the repression. For it is now immaterial whether I have conceived the psychological relations in question with approximate correctness, or, as is easily possible in such a difficult matter, in an erroneous and fragmentary manner. Whatever changes may be made in the interpretation of the psychic censor and of the correct and of the abnormal elaboration of the dream content, the fact nevertheless remains that such processes are active in dream formation, and that essentially they show the closest analogy to the processes observed in the formation of the hysterical symptoms. The dream is not a pathological phenomenon, and it does not leave behind an enfeeblement of the mental faculties. The objection that no deduction can be drawn regarding the dreams of healthy persons from my own dreams and from those of neurotic patients may be rejected without comment. Hence, when we draw conclusions from the phenomena as to their motive forces, we recognize that the psychic mechanism made use of by the neuroses is not created by a morbid disturbance of the psychic life, but is found ready in the normal structure of the psychic apparatus. The two psychic systems, the censor crossing between them, the inhibition and the covering of the one activity by the other, the relations of both to consciousness—or whatever may offer a more correct interpretation of the actual conditions in their stead—all these belong to the normal structure of our psychic instrument, and the dream points out for us one of the roads leading to a knowledge of this structure. If, in addition to our knowledge, we wish to be contented with a minimum perfectly established, we shall say that the dream gives us proof that the *suppressed, material continues to exist even in the normal person and remains capable of psychic activity*. The dream itself is one of the manifestations of this suppressed material; theoretically, this is true in *all* cases; according to substantial experience it is true in at least a great number of such as most conspicuously display the prominent characteristics of dream life. The suppressed psychic material, which in the waking state has been prevented from expression and cut off from internal perception *by the antagonistic adjustment of the contradictions*, finds ways and means of obtruding itself on consciousness during the night under the domination of the compromise formations.

"Flectere si nequeo superos, Acheronta movebo."

At any rate the interpretation of dreams is the *via regia* to a knowledge of the unconscious in the psychic life.

In following the analysis of the dream we have made some progress toward an understanding of the composition of this most marvelous and most mysterious of instruments; to be sure, we have not gone very far, but enough of a beginning has been made to allow us to advance from other so-called pathological formations further into the analysis of the unconscious. Disease—at least that which is justly termed functional—is not due to the destruction of this apparatus, and the establishment of new splittings in its interior; it is rather to be explained dynamically through the strengthening and weakening of the components in the play of forces by which so many activities are concealed during the normal function. We have been able to show in another place how the composition of the apparatus from the two systems permits a subtilization even of the normal activity which would be impossible for a single system.

[Footnote 1](#): Cf. the significant observations by J. Bueuer in our *Studies on Hysteria*, 1895, and 2nd ed. 1909.

[Footnote 2](#): Here, as in other places, there are gaps in the treatment of the subject, which I have left intentionally, because to fill them up would require on the one hand too great effort, and on the other hand an extensive reference to material that is foreign to the dream. Thus I have avoided stating whether I connect with the word "suppressed" another sense than with the word "repressed." It has been made clear only that the latter emphasizes more than the former the relation to the unconscious. I have not entered into the cognate problem why the dream thoughts also experience distortion by the censor when they abandon the progressive continuation to consciousness and choose the path of regression. I have been above all anxious to awaken an interest in the problems to which the further analysis of the dreamwork leads and to indicate the other themes which meet these on the way. It was not always easy to decide just where the pursuit should be discontinued. That I have not treated exhaustively the part played in the dream by the psychosexual life and have avoided the interpretation of dreams of an obvious sexual content is due to a special reason which may not come up to the reader's expectation. To be sure, it is very far from my ideas and the principles expressed by me in neuropathology to regard the sexual life as a "pudendum" which should be left unconsidered by the physician and the scientific investigator. I also consider ludicrous the moral indignation which prompted the translator of Artemidoros of Daldis to keep from the reader's knowledge the chapter on sexual dreams contained in the *Symbolism of the Dreams*. As for myself, I have been actuated solely by the conviction that in the explanation of sexual dreams I should be bound to entangle myself deeply in the still unexplained problems of perversion and bisexuality; and for that reason I have reserved this material for another connection.

IX

THE UNCONSCIOUS AND CONSCIOUSNESS —REALITY

On closer inspection we find that it is not the existence of two systems near the motor end of the apparatus but of two kinds of processes or modes of emotional discharge, the assumption of which was explained in the psychological discussions of the previous chapter. This can make no difference for us, for we must always be ready to drop our auxiliary ideas whenever we deem ourselves in position to replace them by something else approaching more closely to the unknown reality. Let us now try to correct some views which might be erroneously formed as long as we regarded the two systems in the crudest and most obvious sense as two localities within the psychic apparatus, views which have left their traces in the terms "repression" and "penetration." Thus, when we say that an unconscious idea strives for transference into the foreconscious in order later to penetrate consciousness, we do not mean that a second idea is to be formed situated in a new locality like an interlineation near which the original continues to remain; also, when we speak of penetration into consciousness, we wish carefully to avoid any idea of change of locality. When we say that a foreconscious idea is repressed and subsequently taken up by the unconscious, we might be tempted by these figures, borrowed from the idea of a struggle over a territory, to assume that an arrangement is really broken up in one psychic locality and replaced by a new one in the other locality. For these comparisons we substitute what would seem to correspond better with the real state of affairs by saying that an energy occupation is displaced to or withdrawn from a certain arrangement so that the psychic formation falls under the domination of a system or is withdrawn from the same. Here again we replace a topical mode of presentation by a dynamic; it is not the psychic formation that appears to us as the moving factor but the innervation of the same.

I deem it appropriate and justifiable, however, to apply ourselves still further to the illustrative conception of the two systems. We shall avoid any

misapplication of this manner of representation if we remember that presentations, thoughts, and psychic formations should generally not be localized in the organic elements of the nervous system, but, so to speak, between them, where resistances and paths form the correlate corresponding to them. Everything that can become an object of our internal perception is virtual, like the image in the telescope produced by the passage of the rays of light. But we are justified in assuming the existence of the systems, which have nothing psychic in themselves and which never become accessible to our psychic perception, corresponding to the lenses of the telescope which design the image. If we continue this comparison, we may say that the censor between two systems corresponds to the refraction of rays during their passage into a new medium.

Thus far we have made psychology on our own responsibility; it is now time to examine the theoretical opinions governing present-day psychology and to test their relation to our theories. The question of the unconscious, in psychology is, according to the authoritative words of Lipps, less a psychological question than the question of psychology. As long as psychology settled this question with the verbal explanation that the "psychic" is the "conscious" and that "unconscious psychic occurrences" are an obvious contradiction, a psychological estimate of the observations gained by the physician from abnormal mental states was precluded. The physician and the philosopher agree only when both acknowledge that unconscious psychic processes are "the appropriate and well-justified expression for an established fact." The physician cannot but reject with a shrug of his shoulders the assertion that "consciousness is the indispensable quality of the psychic"; he may assume, if his respect for the utterings of the philosophers still be strong enough, that he and they do not treat the same subject and do not pursue the same science. For a single intelligent observation of the psychic life of a neurotic, a single analysis of a dream must force upon him the unalterable conviction that the most complicated and correct mental operations, to which no one will refuse the name of psychic occurrences, may take place without exciting the consciousness of the person. It is true that the physician does not learn of these unconscious processes until they have exerted such an effect on consciousness as to admit communication or observation. But this effect of consciousness may show a psychic character widely differing from the unconscious process, so

that the internal perception cannot possibly recognize the one as a substitute for the other. The physician must reserve for himself the right to penetrate, by a process of deduction, from the effect on consciousness to the unconscious psychic process; he learns in this way that the effect on consciousness is only a remote psychic product of the unconscious process and that the latter has not become conscious as such; that it has been in existence and operative without betraying itself in any way to consciousness.

A reaction from the over-estimation of the quality of consciousness becomes the indispensable preliminary condition for any correct insight into the behavior of the psychic. In the words of Lipps, the unconscious must be accepted as the general basis of the psychic life. The unconscious is the larger circle which includes within itself the smaller circle of the conscious; everything conscious has its preliminary step in the unconscious, whereas the unconscious may stop with this step and still claim full value as a psychic activity. Properly speaking, the unconscious is the real psychic; *its inner nature is just as unknown to us as the reality of the external world, and it is just as imperfectly reported to us through the data of consciousness as is the external world through the indications of our sensory organs.*

A series of dream problems which have intensely occupied older authors will be laid aside when the old opposition between conscious life and dream life is abandoned and the unconscious psychic assigned to its proper place. Thus many of the activities whose performances in the dream have excited our admiration are now no longer to be attributed to the dream but to unconscious thinking, which is also active during the day. If, according to Scherner, the dream seems to play with a symboling representation of the body, we know that this is the work of certain unconscious phantasies which have probably given in to sexual emotions, and that these phantasies come to expression not only in dreams but also in hysterical phobias and in other symptoms. If the dream continues and settles activities of the day and even brings to light valuable inspirations, we have only to subtract from it the dream disguise as a feat of dream-work and a mark of assistance from obscure forces in the depth of the mind (*cf.* the devil in Tartini's sonata dream). The intellectual task as such must be attributed to the same psychic forces which perform all such tasks during the day. We are probably far too

much inclined to over-estimate the conscious character even of intellectual and artistic productions. From the communications of some of the most highly productive persons, such as Goethe and Helmholtz, we learn, indeed, that the most essential and original parts in their creations came to them in the form of inspirations and reached their perceptions almost finished. There is nothing strange about the assistance of the conscious activity in other cases where there was a concerted effort of all the psychic forces. But it is a much abused privilege of the conscious activity that it is allowed to hide from us all other activities wherever it participates.

It will hardly be worth while to take up the historical significance of dreams as a special subject. Where, for instance, a chieftain has been urged through a dream to engage in a bold undertaking the success of which has had the effect of changing history, a new problem results only so long as the dream, regarded as a strange power, is contrasted with other more familiar psychic forces; the problem, however, disappears when we regard the dream as a form of expression for feelings which are burdened with resistance during the day and which can receive reinforcements at night from deep emotional sources. But the great respect shown by the ancients for the dream is based on a correct psychological surmise. It is a homage paid to the unsubdued and indestructible in the human mind, and to the demoniacal which furnishes the dream-wish and which we find again in our unconscious.

Not inadvisedly do I use the expression "in our unconscious," for what we so designate does not coincide with the unconscious of the philosophers, nor with the unconscious of Lipps. In the latter uses it is intended to designate only the opposite of conscious. That there are also unconscious psychic processes beside the conscious ones is the hotly contested and energetically defended issue. Lipps gives us the more far-reaching theory that everything psychic exists as unconscious, but that some of it may exist also as conscious. But it was not to prove this theory that we have adduced the phenomena of the dream and of the hysterical symptom formation; the observation of normal life alone suffices to establish its correctness beyond any doubt. The new fact that we have learned from the analysis of the psychopathological formations, and indeed from their first member, viz. dreams, is that the unconscious—hence the psychic—occurs as a function of two separate systems and that it occurs as such even in normal psychic

life. Consequently there are two kinds of unconscious, which we do not as yet find distinguished by the psychologists. Both are unconscious in the psychological sense; but in our sense the first, which we call Unc., is likewise incapable of consciousness, whereas the second we term "Forec." because its emotions, after the observance of certain rules, can reach consciousness, perhaps not before they have again undergone censorship, but still regardless of the Unc. system. The fact that in order to attain consciousness the emotions must traverse an unalterable series of events or succession of instances, as is betrayed through their alteration by the censor, has helped us to draw a comparison from spatiality. We described the relations of the two systems to each other and to consciousness by saying that the system Forec. is like a screen between the system Unc. and consciousness. The system Forec. not only bars access to consciousness, but also controls the entrance to voluntary motility and is capable of sending out a sum of mobile energy, a portion of which is familiar to us as attention.

We must also steer clear of the distinctions superconscious and subconscious which have found so much favor in the more recent literature on the psychoneuroses, for just such a distinction seems to emphasize the equivalence of the psychic and the conscious.

What part now remains in our description of the once all-powerful and all-overshadowing consciousness? None other than that of a sensory organ for the perception of psychic qualities. According to the fundamental idea of schematic undertaking we can conceive the conscious perception only as the particular activity of an independent system for which the abbreviated designation "Cons." commends itself. This system we conceive to be similar in its mechanical characteristics to the perception system P, hence excitable by qualities and incapable of retaining the trace of changes, *i.e.* it is devoid of memory. The psychic apparatus which, with the sensory organs of the P-system, is turned to the outer world, is itself the outer world for the sensory organ of Cons.; the teleological justification of which rests on this relationship. We are here once more confronted with the principle of the succession of instances which seems to dominate the structure of the apparatus. The material under excitement flows to the Cons. sensory organ from two sides, firstly from the P-system whose excitement, qualitatively determined, probably experiences a new elaboration until it comes to

conscious perception; and, secondly, from the interior of the apparatus itself, the quantitative processes of which are perceived as a qualitative series of pleasure and pain as soon as they have undergone certain changes.

The philosophers, who have learned that correct and highly complicated thought structures are possible even without the coöperation of consciousness, have found it difficult to attribute any function to consciousness; it has appeared to them a superfluous mirroring of the perfected psychic process. The analogy of our Cons. system with the systems of perception relieves us of this embarrassment. We see that perception through our sensory organs results in directing the occupation of attention to those paths on which the incoming sensory excitement is diffused; the qualitative excitement of the P-system serves the mobile quantity of the psychic apparatus as a regulator for its discharge. We may claim the same function for the overlying sensory organ of the Cons. system. By assuming new qualities, it furnishes a new contribution toward the guidance and suitable distribution of the mobile occupation quantities. By means of the perceptions of pleasure and pain, it influences the course of the occupations within the psychic apparatus, which normally operates unconsciously and through the displacement of quantities. It is probable that the principle of pain first regulates the displacements of occupation automatically, but it is quite possible that the consciousness of these qualities adds a second and more subtle regulation which may even oppose the first and perfect the working capacity of the apparatus by placing it in a position contrary to its original design for occupying and developing even that which is connected with the liberation of pain. We learn from neuropsychology that an important part in the functional activity of the apparatus is attributed to such regulations through the qualitative excitation of the sensory organs. The automatic control of the primary principle of pain and the restriction of mental capacity connected with it are broken by the sensible regulations, which in their turn are again automatisms. We learn that the repression which, though originally expedient, terminates nevertheless in a harmful rejection of inhibition and of psychic domination, is so much more easily accomplished with reminiscences than with perceptions, because in the former there is no increase in occupation through the excitement of the psychic sensory organs. When an idea to be rejected has once failed to become conscious because it has succumbed to

repression, it can be repressed on other occasions only because it has been withdrawn from conscious perception on other grounds. These are hints employed by therapy in order to bring about a retrogression of accomplished repressions.

The value of the over-occupation which is produced by the regulating influence of the Cons. sensory organ on the mobile quantity, is demonstrated in the teleological connection by nothing more clearly than by the creation of a new series of qualities and consequently a new regulation which constitutes the precedence of man over the animals. For the mental processes are in themselves devoid of quality except for the excitements of pleasure and pain accompanying them, which, as we know, are to be held in check as possible disturbances of thought. In order to endow them with a quality, they are associated in man with verbal memories, the qualitative remnants of which suffice to draw upon them the attention of consciousness which in turn endows thought with a new mobile energy.

The manifold problems of consciousness in their entirety can be examined only through an analysis of the hysterical mental process. From this analysis we receive the impression that the transition from the foreconscious to the occupation of consciousness is also connected with a censorship similar to the one between the Unc. and the Forec. This censorship, too, begins to act only with the reaching of a certain quantitative degree, so that few intense thought formations escape it. Every possible case of detention from consciousness, as well as of penetration to consciousness, under restriction is found included within the picture of the psychoneurotic phenomena; every case points to the intimate and twofold connection between the censor and consciousness. I shall conclude these psychological discussions with the report of two such occurrences.

On the occasion of a consultation a few years ago the subject was an intelligent and innocent-looking girl. Her attire was strange; whereas a woman's garb is usually groomed to the last fold, she had one of her stockings hanging down and two of her waist buttons opened. She complained of pains in one of her legs, and exposed her leg unrequested. Her chief complaint, however, was in her own words as follows: She had a feeling in her body as if something was stuck into it which moved to and fro

and made her tremble through and through. This sometimes made her whole body stiff. On hearing this, my colleague in consultation looked at me; the complaint was quite plain to him. To both of us it seemed peculiar that the patient's mother thought nothing of the matter; of course she herself must have been repeatedly in the situation described by her child. As for the girl, she had no idea of the import of her words or she would never have allowed them to pass her lips. Here the censor had been deceived so successfully that under the mask of an innocent complaint a phantasy was admitted to consciousness which otherwise would have remained in the foreconscious.

Another example: I began the psychoanalytic treatment of a boy of fourteen years who was suffering from *tic convulsif*, hysterical vomiting, headache, &c., by assuring him that, after closing his eyes, he would see pictures or have ideas, which I requested him to communicate to me. He answered by describing pictures. The last impression he had received before coming to me was visually revived in his memory. He had played a game of checkers with his uncle, and now saw the checkerboard before him. He commented on various positions that were favorable or unfavorable, on moves that were not safe to make. He then saw a dagger lying on the checker-board, an object belonging to his father, but transferred to the checker-board by his phantasy. Then a sickle was lying on the board; next a scythe was added; and, finally, he beheld the likeness of an old peasant mowing the grass in front of the boy's distant parental home. A few days later I discovered the meaning of this series of pictures. Disagreeable family relations had made the boy nervous. It was the case of a strict and crabbed father who lived unhappily with his mother, and whose educational methods consisted in threats; of the separation of his father from his tender and delicate mother, and the remarrying of his father, who one day brought home a young woman as his new mamma. The illness of the fourteen-year-old boy broke out a few days later. It was the suppressed anger against his father that had composed these pictures into intelligible allusions. The material was furnished by a reminiscence from mythology, The sickle was the one with which Zeus castrated his father; the scythe and the likeness of the peasant represented Kronos, the violent old man who eats his children and upon whom Zeus wreaks vengeance in so unfilial a manner. The marriage of the father gave the boy an opportunity to return the reproaches and threats of

his father—which had previously been made because the child played with his genitals (the checkerboard; the prohibitive moves; the dagger with which a person may be killed). We have here long repressed memories and their unconscious remnants which, under the guise of senseless pictures have slipped into consciousness by devious paths left open to them.

I should then expect to find the theoretical value of the study of dreams in its contribution to psychological knowledge and in its preparation for an understanding of neuroses. Who can foresee the importance of a thorough knowledge of the structure and activities of the psychic apparatus when even our present state of knowledge produces a happy therapeutic influence in the curable forms of the psychoneuroses? What about the practical value of such study some one may ask, for psychic knowledge and for the discovering of the secret peculiarities of individual character? Have not the unconscious feelings revealed by the dream the value of real forces in the psychic life? Should we take lightly the ethical significance of the suppressed wishes which, as they now create dreams, may some day create other things?

I do not feel justified in answering these questions. I have not thought further upon this side of the dream problem. I believe, however, that at all events the Roman Emperor was in the wrong who ordered one of his subjects executed because the latter dreamt that he had killed the Emperor. He should first have endeavored to discover the significance of the dream; most probably it was not what it seemed to be. And even if a dream of different content had the significance of this offense against majesty, it would still have been in place to remember the words of Plato, that the virtuous man contents himself with dreaming that which the wicked man does in actual life. I am therefore of the opinion that it is best to accord freedom to dreams. Whether any reality is to be attributed to the unconscious wishes, and in what sense, I am not prepared to say offhand. Reality must naturally be denied to all transition—and intermediate thoughts. If we had before us the unconscious wishes, brought to their last and truest expression, we should still do well to remember that more than one single form of existence must be ascribed to the psychic reality. Action and the conscious expression of thought mostly suffice for the practical need of judging a man's character. Action, above all, merits to be placed in

the first rank; for many of the impulses penetrating consciousness are neutralized by real forces of the psychic life before they are converted into action; indeed, the reason why they frequently do not encounter any psychic obstacle on their way is because the unconscious is certain of their meeting with resistances later. In any case it is instructive to become familiar with the much raked-up soil from which our virtues proudly arise. For the complication of human character moving dynamically in all directions very rarely accommodates itself to adjustment through a simple alternative, as our antiquated moral philosophy would have it.

And how about the value of the dream for a knowledge of the future? That, of course, we cannot consider. One feels inclined to substitute: "for a knowledge of the past." For the dream originates from the past in every sense. To be sure the ancient belief that the dream reveals the future is not entirely devoid of truth. By representing to us a wish as fulfilled the dream certainly leads us into the future; but this future, taken by the dreamer as present, has been formed into the likeness of that past by the indestructible wish.

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PSYCHOLOGY

BY

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TO
MY DEAR FRIEND
FRANÇOIS PILLON.
AS A TOKEN OF AFFECTION,
AND AN ACKNOWLEDGMENT OF WHAT I OWE
TO THE
CRITIQUE PHILOSOPHIQUE.

PREFACE.

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The treatise which follows has in the main grown up in connection with the author's classroom instruction in Psychology, although it is true that some of the chapters are more 'metaphysical,' and others fuller of detail, than is suitable for students who are going over the subject for the first time. The consequence of this is that, in spite of the exclusion of the important subjects of pleasure and pain, and moral and æsthetic feelings and judgments, the work has grown to a length which no one can regret more than the writer himself. The man must indeed be sanguine who, in this crowded age, can hope to have many readers for fourteen hundred continuous pages from his pen. But *wer Vieles bringt wird Manchem etwas bringen*; and, by judiciously skipping according to their several needs, I am sure that many sorts of readers, even those who are just beginning the study of the subject, will find my book of use. Since the beginners are most in need of guidance, I suggest for their behoof that they omit altogether on a first reading chapters 6, 7, 8, 10 (from page 330 to page 371), 12, 13, 15, 17, 20, 21, and 28. The better to awaken the neophyte's interest, it is possible that the wise order would be to pass directly from chapter 4 to chapters 23, 24, 25, and 26, and thence to return to the first volume again. Chapter 20, on Space-perception, is a terrible thing, which, unless written with all that detail, could not be fairly treated at all. An abridgment of it, called 'The Spatial Quale,' which appeared in the *Journal of Speculative Philosophy*, vol. xiii, p. 64, may be found by some persons a useful substitute for the entire chapter.

I have kept close to the point of view of natural science throughout the book. Every natural science assumes certain data uncritically, and declines to challenge the elements between which its own 'laws' obtain, and from which its own deductions are carried on. Psychology, the science of finite individual minds, assumes as its data (1) *thoughts and feelings*, and (2) *a physical world* in time and space with which they coexist and which (3) *they know*. Of course these data themselves are discussable; but the discussion of them (as of other

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elements) is called metaphysics and falls outside the province of this book. This book, assuming that thoughts and feelings exist and are vehicles of knowledge, thereupon contends that psychology when she has ascertained the empirical correlation of the various sorts of thought or feeling with definite conditions of the brain, can go no farther—can go no farther, that is, as a natural science. If she goes farther she becomes metaphysical. All attempts to *explain* our phenomenally given thoughts as products of deeper-lying entities (whether the latter be named 'Soul,' 'Transcendental Ego,' 'Ideas,' or 'Elementary Units of Consciousness') are metaphysical. This book consequently rejects both the associationist and the spiritualist theories; and in this strictly positivistic point of view consists the only feature of it for which I feel tempted to claim originality. Of course this point of view is anything but ultimate. Men must keep thinking; and the data assumed by psychology, just like those assumed by physics and the other natural sciences, must some time be overhauled. The effort to overhaul them clearly and thoroughly is metaphysics; but metaphysics can only perform her task well when distinctly conscious of its great extent. Metaphysics fragmentary, irresponsible, and half-awake, and unconscious that she is metaphysical, spoils two good things when she injects herself into a natural science. And it seems to me that the theories both of a spiritual agent and of associated 'ideas' are, as they figure in the psychology-books, just such metaphysics as this. Even if their results be true, it would be as well to keep them, *as thus presented*, out of psychology as it is to keep the results of idealism out of physics.

I have therefore treated our passing thoughts as integers, and regarded the mere laws of their coexistence with brain-states as the ultimate laws for our science. The reader will in vain seek for any closed system in the book. It is mainly a mass of descriptive details, running out into queries which only a metaphysics alive to the weight of her task can hope successfully to deal with. That will perhaps be centuries hence; and meanwhile the best mark of health that a science can show is this unfinished-seeming front.

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The completion of the book has been so slow that several chapters have been published successively in *Mind*, the *Journal of Speculative Philosophy*, the *Popular Science Monthly*, and *Scribner's Magazine*. Acknowledgment is made in the proper places.

The bibliography, I regret to say, is quite unsystematic. I have habitually given my authority for special experimental facts; but beyond that I have aimed mainly to cite books that would probably be actually used by the ordinary American college-student in his collateral reading. The bibliography in W. Volkmann von Volkmar's *Lehrbuch der Psychologie* (1875) is so complete, up to its date, that there is no need of an inferior duplicate. And for more recent references, Sully's *Outlines*, Dewey's *Psychology*, and Baldwin's *Handbook of Psychology* may be advantageously used.

Finally, where one owes to so many, it seems absurd to single out particular creditors; yet I cannot resist the temptation at the end of my first literary venture to record my gratitude for the inspiration I have got from the writings of J. S. Mill, Lotze, Renouvier, Hodgson, and Wundt, and from the intellectual companionship (to name only five names) of Chauncey Wright and Charles Peirce in old times, and more recently of Stanley Hall, James Putnam, and Josiah Royce.

HARVARD UNIVERSITY, August 1890.

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INDEX.

PSYCHOLOGY.

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CHAPTER I.

THE SCOPE OF PSYCHOLOGY.

Psychology is the Science of Mental Life, both of its phenomena and of their conditions. The phenomena are such things as we call feelings, desires, cognitions, reasonings, decisions, and the like; and, superficially considered, their variety and complexity is such as to leave a chaotic impression on the observer. The most natural and consequently the earliest way of unifying the material was, first, to classify it as well as might be, and, secondly, to affiliate the diverse mental modes thus found, upon a simple entity, the personal Soul, of which they are taken to be so many facultative manifestations. Now, for instance, the Soul

manifests its faculty of Memory, now of Reasoning, now of Volition, or again its Imagination or its Appetite. This is the orthodox 'spiritualistic' theory of scholasticism and of common-sense. Another and a less obvious way of unifying the chaos is to seek common elements in the divers mental facts rather than a common agent behind them, and to explain them constructively by the various forms of arrangement of these elements, as one explains houses by stones and bricks. The 'associationist' schools of Herbart in Germany, and of Hume the Mills and Bain in Britain have thus constructed a *psychology without a soul* by taking discrete 'ideas,' faint or vivid, and showing how, by their cohesions, repulsions, and forms of succession, such things as reminiscences, perceptions, emotions, volitions, passions, theories, and all the other furnishings of an individual's mind may be engendered. The very Self or *ego* of the individual comes in this way to be viewed no longer as the pre-existing source of the representations, but rather as their last and most complicated fruit.

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Now, if we strive rigorously to simplify the phenomena in either of these ways, we soon become aware of inadequacies in our method. Any particular cognition, for example, or recollection, is accounted for on the soul-theory by being referred to the spiritual faculties of Cognition or of Memory. These faculties themselves are thought of as absolute properties of the soul; that is, to take the case of memory, no reason is given why we should remember a fact as it happened, except that so to remember it constitutes the essence of our Recollective Power. We may, as spiritualists, try to explain our memory's failures and blunders by secondary causes. But its *successes* can invoke no factors save the existence of certain objective things to be remembered on the one hand, and of our faculty of memory on the other. When, for instance, I recall my graduation-day, and drag all its incidents and emotions up from death's dateless night, no mechanical cause can explain this process, nor can any analysis reduce it to lower terms or make its nature seem other than an ultimate *datum*, which, whether we rebel or not at its mysteriousness, must simply be taken for granted if we are to psychologize at all. However the associationist may represent the present ideas as thronging and arranging themselves, still, the spiritualist insists, he has in the end to admit that *something*, be it brain, be it 'ideas,' be it 'association,' *knows* past time *as* past, and fills it out with this or that event. And when the spiritualist calls memory an 'irreducible faculty,' he says no more than this admission of the associationist already grants.

And yet the admission is far from being a satisfactory simplification of the concrete facts. For why should this absolute god-given Faculty retain so much better the events of yesterday than those of last year, and, best of all, those of an hour ago? Why, again, in old age should its grasp of childhood's events seem firmest? Why should illness and exhaustion enfeeble it? Why should repeating an experience strengthen our recollection of it? Why should drugs, fevers, asphyxia, and excitement resuscitate things long since forgotten? If we content ourselves with merely affirming that the faculty of memory is so peculiarly constituted by nature as to exhibit just these oddities, we seem little the better for having invoked it, for our explanation becomes as complicated as that of the crude facts with which we started. Moreover there is something grotesque and irrational in the supposition that the soul is equipped with elementary powers of such an ingeniously intricate sort. Why *should* our memory cling more easily to the near than the remote? Why should it lose its grasp of proper sooner than of abstract names? Such peculiarities seem quite fantastic; and might, for aught we can see *a priori*, be the precise opposites of what they are. Evidently, then, *the faculty does not exist absolutely, but works under conditions*; and *the quest of the conditions* becomes the psychologist's most interesting task.

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However firmly he may hold to the soul and her remembering faculty, he must acknowledge that she never exerts the latter without a *cue*, and that something must always precede and *remind* us of whatever we are to recollect. "An *idea*," says the associationist, "an idea associated with the remembered thing; and this explains also why things repeatedly met with are more easily recollected, for their associates on the various occasions furnish so many distinct avenues of recall." But this does not explain the effects of fever, exhaustion, hypnotism, old age, and the like. And in general, the pure associationist's account of our

mental life is almost as bewildering as that of the pure spiritualist. This multitude of ideas, existing absolutely, yet clinging together, and weaving an endless carpet of themselves, like dominoes in ceaseless change, or the bits of glass in a kaleidoscope,—whence do they get their fantastic laws of clinging, and why do they cling in just the shapes they do?

For this the associationist must introduce the order of experience in the outer world. The dance of the ideas is a copy, somewhat mutilated and altered, of the order of phenomena. But the slightest reflection shows that phenomena have absolutely no power to influence our ideas until they have first impressed our senses and our brain. The bare existence of a past fact is no ground for our remembering it. Unless we have seen it, or somehow *undergone* it, we shall never know of its having been. The expediences of the body are thus one of the conditions of the faculty of memory being what it is. And a very small amount of reflection on facts shows that one part of the body, namely, the brain, is the part whose experiences are directly concerned. If the nervous communication be cut off between the brain and other parts, the experiences of those other parts are non-existent for the mind. The eye is blind, the ear deaf, the hand insensible and motionless. And conversely, if the brain be injured, consciousness is abolished or altered, even although every other organ in the body be ready to play its normal part. A blow on the head, a sudden subtraction of blood, the pressure of an apoplectic hemorrhage, may have the first effect; whilst a very few ounces of alcohol or grains of opium or hasheesh, or a whiff of chloroform or nitrous oxide gas, are sure to have the second. The delirium of fever, the altered self of insanity, are all due to foreign matters circulating through the brain, or to pathological changes in that organ's substance. The fact that the brain is the one immediate bodily condition of the mental operations is indeed so universally admitted nowadays that I need spend no more time in illustrating it, but will simply postulate it and pass on. The whole remainder of the book will be more or less of a proof that the postulate was correct.

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Bodily experiences, therefore, and more particularly brain-experiences, must take a place amongst those conditions of the mental life of which Psychology need take account. *The spiritualist and the associationist must both be 'cerebralists'*, to the extent at least of admitting that certain peculiarities in the way of working of their own favorite principles are explicable only by the fact that the brain laws are a codeterminant of the result. Our first conclusion, then, is that a certain amount of brain-physiology must be presupposed or included in Psychology.^[1]

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In still another way the psychologist is forced to be something of a nerve-physiologist. Mental phenomena are not only conditioned *a parte ante* by bodily processes; but they lead to them *a parte post*. That they lead to *acts* is of course the most familiar of truths, but I do not merely mean acts in the sense of voluntary and deliberate muscular performances. Mental states occasion also changes in the calibre of blood-vessels, or alteration in the heart-beats, or processes more subtle still, in glands and viscera. If these are taken into account, as well as acts which follow at some *remote period* because the mental state was once there, it will be safe to lay down the general law that *no mental modification ever occurs which is not accompanied or followed by a bodily change*. The ideas and feelings, *e.g.*, which these present printed characters excite in the reader's mind not only occasion movements of his eyes and nascent movements of articulation in him, but will some day make him speak, or take sides in a discussion, or give advice, or choose a book to read, differently from what would have been the case had they never impressed his retina. Our psychology must therefore take account not only of the conditions antecedent to mental states, but of their resultant consequences as well.

But actions originally prompted by conscious intelligence may grow so automatic by dint of habit as to be apparently unconsciously performed. Standing, walking, buttoning and unbuttoning, piano-playing, talking, even saying one's prayers, may be done when the mind is absorbed in other things. The performances of animal *instinct* seem semi-automatic, and the *reflex acts* of self-preservation certainly are so. Yet they resemble intelligent acts in bringing about the *same ends* at which the animals' consciousness, on other occasions, deliberately aims. Shall the study of such machine-like yet purposive acts as these be included in Psychology?

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The boundary-line of the mental is certainly vague. It is better not to be pedantic, but to let the science be as vague as its subject, and include such phenomena as these if by so doing we can throw any light on the main business in hand. It will ere long be seen, I trust, that we can; and that we gain much more by a broad than by a narrow conception of our subject. At a certain stage in the development of every science a degree of vagueness is what best consists with fertility. On the whole, few recent formulas have done more real service of a rough sort in psychology than the Spencerian one that the essence of mental life and of bodily life are one, namely, 'the adjustment of inner to outer relations.' Such a formula is vagueness incarnate; but because it takes into account the fact that minds inhabit environments which act on them and on which they in turn react; because, in short, it takes mind in the midst of all its concrete relations, it is immensely more fertile than the old-fashioned 'rational psychology,' which treated the soul as a detached existent, sufficient unto itself, and assumed to consider only its nature and properties. I shall therefore feel free to make any sallies into zoology or into pure nerve-physiology which may seem instructive for our purposes, but otherwise shall leave those sciences to the physiologists.

Can we state more distinctly still the manner in which the mental life seems to intervene between impressions made from without upon the body, and reactions of the body upon the outer world again? Let us look at a few facts.

If some iron filings be sprinkled on a table and a magnet brought near them, they will fly through the air for a certain distance and stick to its surface. A savage seeing the phenomenon explains it as the result of an attraction or love between the magnet and the filings. But let a card cover the poles of the magnet, and the filings will press forever against its surface without its ever occurring to them to pass around its sides and thus come into more direct contact with the object of their love. Blow bubbles through a tube into the bottom of a pail of water, they will rise to the surface and mingle with the air. Their action may again be poetically interpreted as due to a longing to recombine with the mother-atmosphere above the surface. But if you invert a jar full of water over the pail, they will rise and remain lodged beneath its bottom, shut in from the outer air, although a slight deflection from their course at the outset, or a re-descent towards the rim of the jar when they found their upward course impeded, would easily have set them free.

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If now we pass from such actions as these to those of living things, we notice a striking difference. Romeo wants Juliet as the filings want the magnet; and if no obstacles intervene he moves towards her by as straight a line as they. But Romeo and Juliet, if a wall be built between them, do not remain idiotically pressing their faces against its opposite sides like the magnet and the filings with the card. Romeo soon finds a circuitous way, by scaling the wall or otherwise, of touching Juliet's lips directly. With the filings the path is fixed; whether it reaches the end depends on accidents. With the lover it is the end which is fixed, the path may be modified indefinitely.

Suppose a living frog in the position in which we placed our bubbles of air, namely, at the bottom of a jar of water. The want of breath will soon make him also long to rejoin the mother-atmosphere, and he will take the shortest path to his end by swimming straight

upwards. But if a jar full of water be inverted over him, he will not, like the bubbles, perpetually press his nose against its unyielding roof, but will restlessly explore the neighborhood until by re-descending again he has discovered a path round its brim to the goal of his desires. Again the fixed end, the varying means!

Such contrasts between living and inanimate performances end by leading men to deny that in the physical world final purposes exist at all. Loves and desires are to-day no longer imputed to particles of iron or of air. No one supposes now that the end of any activity which they may display is an ideal purpose presiding over the activity from its outset and soliciting or drawing it into being by a sort of *vis a fronte*. The end, on the contrary, is deemed a mere passive result, pushed into being *a tergo*, having had, so to speak, no voice in its own production. Alter the pre-existing conditions, and with inorganic materials you bring forth each time a different apparent end. But with intelligent agents, altering the conditions changes the activity displayed, but not the end reached; for here the idea of the yet unrealized end co-operates with the conditions to determine what the activities shall be.

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The pursuance of future ends and the choice of means for their attainment are thus the mark and criterion of the presence of mentality in a phenomenon. We all use this test to discriminate between an intelligent and a mechanical performance. We impute no mentality to sticks and stones, because they never seem to move for *the sake of* anything, but always when pushed, and then indifferently and with no sign of choice. So we unhesitatingly call them senseless.

Just so we form our decision upon the deepest of all philosophic problems: Is the Kosmos an expression of intelligence rational in its inward nature, or a brute external fact pure and simple? If we find ourselves, in contemplating it, unable to banish the impression that it is a realm of final purposes, that it exists for the sake of something, we place intelligence at the heart of it and have a religion. If, on the contrary, in surveying its irremediable flux, we can think of the present only as so much mere mechanical sprouting from the past, occurring with no reference to the future, we are atheists and materialists.

In the lengthy discussions which psychologists have carried on about the amount of intelligence displayed by lower mammals, or the amount of consciousness involved in the functions of the nerve-centres of reptiles, the same test has always been applied: Is the character of the actions such that we must believe them to be performed *for the sake of* their result? The result in question, as we shall hereafter abundantly see, is as a rule a useful one, —the animal is, on the whole, safer under the circumstances for bringing it forth. So far the action has a teleological character; but such mere outward teleology as this might still be the blind result of *vis a tergo*. The growth and movements of plants, the processes of development, digestion, secretion, etc., in animals, supply innumerable instances of performances useful to the individual which may nevertheless be, and by most of us are supposed to be, produced by automatic mechanism. The physiologist does not confidently assert conscious intelligence in the frog's spinal cord until he has shown that the useful result which the nervous machinery brings forth under a given irritation *remains the same when the machinery is altered*. If, to take the stock instance, the right knee of a headless frog be irritated with acid, the right foot will wipe it off. When, however, this foot is amputated, the animal will often raise the *left* foot to the spot and wipe the offending material away.

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Pflüger and Lewes reason from such facts in the following way: If the first reaction were the result of mere machinery, they say; if that irritated portion of the skin discharged the right leg as a trigger discharges its own barrel of a shot-gun; then amputating the right foot would indeed frustrate the wiping, but would not make the *left* leg move. It would simply result in the right stump moving through the empty air (which is in fact the phenomenon sometimes observed). The right trigger makes no effort to discharge the left barrel if the right one be

unloaded; nor does an electrical machine ever get restless because it can only emit sparks, and not hem pillow-cases like a sewing-machine.

If, on the contrary, the right leg originally moved for the *purpose* of wiping the acid, then nothing is more natural than that, when the easiest means of effecting that purpose prove fruitless, other means should be tried. Every failure must keep the animal in a state of disappointment which will lead to all sorts of new trials and devices; and tranquillity will not ensue till one of these, by a happy stroke, achieves the wished-for end.

In a similar way Goltz ascribes intelligence to the frog's optic lobes and cerebellum. We alluded above to the manner in which a sound frog imprisoned in water will discover an outlet to the atmosphere. Goltz found that frogs deprived of their cerebral hemispheres would often exhibit a like ingenuity. Such a frog, after rising from the bottom and finding his farther upward progress checked by the glass bell which has been inverted over him, will not persist in butting his nose against the obstacle until dead of suffocation, but will often re-descend and emerge from under its rim as if, not a definite mechanical propulsion upwards, but rather a conscious desire to reach the air by hook or crook were the main-spring of his activity. Goltz concluded from this that the hemispheres are not the sole seal of intellect in frogs. He made the same inference from observing that a brainless frog will turn over from his back to his belly when one of his legs is sewed up, although the movements required are then very different from those excited under normal circumstances by the same annoying position. They seem determined, consequently, not merely by the antecedent irritant, but by the final end,—though the irritant of course is what makes the end desired.

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Another brilliant German author, Liebmann,^[2] argues against the brain's mechanism accounting for mental action, by very similar considerations. A machine as such, he says, will bring forth right results when it is in good order, and wrong results if out of repair. But both kinds of result flow with equally fatal necessity from their conditions. We cannot suppose the clock-work whose structure fatally determines it to a certain rate of speed, noticing that this speed is too slow or too fast and vainly trying to correct it. Its conscience, if it have any, should be as good as that of the best chronometer, for both alike obey equally well the same eternal mechanical laws—laws from behind. But if the *brain* be out of order and the man says "Twice four are two," instead of "Twice four are eight," or else "I must go to the coal to buy the wharf," instead of "I must go to the wharf to buy the coal," instantly there arises a consciousness of error. The wrong performance, though it obey the same mechanical law as the right, is nevertheless condemned,—condemned as contradicting the inner law—the law from in front, the purpose or ideal for which the brain *should* act, whether it do so or not.

We need not discuss here whether these writers in drawing their conclusion have done justice to all the premises I involved in the cases they treat of. We quote their arguments only to show how they appeal to the principle that *no actions but such as are done for an end, and show a choice of means, can be called indubitable expressions of Mind.*

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I shall then adopt this as the criterion by which to circumscribe the subject-matter of this work so far as action enters into it. Many nervous performances will therefore be unmentioned, as being purely physiological. Nor will the anatomy of the nervous system and organs of sense be described anew. The reader will find in H. N. Martin's 'Human Body,' in G. T. Ladd's 'Physiological Psychology,' and in all the other standard Anatomies and Physiologies, a mass of information which we must regard as preliminary and take for granted in the present work.^[3] Of the functions of the cerebral hemispheres, however, since they directly subserve consciousness, it will be well to give some little account.

- [1] Cf. Geo. T. Ladd: Elements of Physiological Psychology (1887), pt. iii, chap. iii, §§ 9, 12.
- [2] Zur Analysis der Wirklichkeit, p. 489.
- [3] Nothing is easier than to familiarize one's self with the mammalian brain. Get a sheep's head, a small saw, chisel, scalpel and forceps (all three can best be had from a surgical-instrument maker), and unravel its parts either by the aid of a human dissecting book, such as Holden's 'Manual of Anatomy,' or by the specific directions *ad hoc* given in such books as Foster and Langley's 'Practical Physiology' (Macmillan) or Morrell's 'Comparative Anatomy and Dissection of Mammalia' (Longmans).

CHAPTER II.

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THE FUNCTIONS OF THE BRAIN.

If I begin chopping the foot of a tree, its branches are unmoved by my act, and its leaves murmur as peacefully as ever in the wind. If, on the contrary, I do violence to the foot of a fellow-man, the rest of his body instantly responds to the aggression by movements of alarm or defence. The reason of this difference is that the man has a nervous system whilst the tree has none; and the function of the nervous system is to bring each part into harmonious co-operation with every other. The afferent nerves, when excited by some physical irritant, be this as gross in its mode of operation as a chopping axe or as subtle as the waves of light, conveys the excitement to the nervous centres. The commotion set up in the centres does not stop there, but discharges itself, if at all strong, through the efferent nerves into muscles and glands, exciting movements of the limbs and viscera, or acts of secretion, which vary with the animal, and with the irritant applied. These acts of response have usually the common character of being of service. They ward off the noxious stimulus and support the beneficial one; whilst if, in itself indifferent, the stimulus be a sign of some distant circumstance of practical importance, the animal's acts are addressed to this circumstance so as to avoid its perils or secure its benefits, as the case may be. To take a common example, if I hear the conductor calling 'All aboard!' as I enter the depot, my heart first stops, then palpitates, and my legs respond to the air-waves falling on my tympanum by quickening their movements. If I stumble as I run, the sensation of falling provokes a movement of the hands towards the direction of the fall, the effect of which is to shield the body from too sudden a shock. If a cinder enter my eye, its lids close forcibly and a copious flow of tears tends to wash it out.

These three responses to a sensational stimulus differ, however, in many respects. The closure of the eye and the lachrymation are quite involuntary, and so is the disturbance of the heart. Such involuntary responses we know as 'reflex' acts. The motion of the arms to break the shock of falling may also be called reflex, since it occurs too quickly to be deliberately intended. Whether it be instinctive or whether it result from the pedestrian education of childhood may be doubtful; it is, at any rate, less automatic than the previous acts, for a man might by conscious effort learn to perform it more skilfully, or even to suppress it altogether. Actions of this kind, into which instinct and volition enter upon equal terms, have been called 'semi-reflex.' The act of running towards the train, on the other hand, has no instinctive element about it. It is purely the result of education, and is preceded by a consciousness of the purpose to be attained and a distinct mandate of the will. It is a 'voluntary act.' Thus the animal's reflex and voluntary performances shade into each other gradually, being connected by acts which may often occur automatically, but may also be modified by conscious intelligence.

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An outside observer, unable to perceive the accompanying consciousness, might be wholly at a loss to discriminate between the automatic acts and those which volition escorted. But if the criterion of mind's existence be the choice of the proper means for the attainment of a supposed end, all the acts seem to be inspired by intelligence, for *appropriateness* characterizes them all alike. This fact, now, has led to two quite opposite theories about the relation to consciousness of the nervous functions. Some authors, finding that the higher voluntary ones seem to require the guidance of feeling, conclude that over the lowest reflexes some such feeling also presides, though it may be a feeling of which *we* remain unconscious. Others, finding that reflex and semi-automatic acts may, notwithstanding their appropriateness, take place with an unconsciousness apparently complete, fly to the opposite extreme and maintain that the appropriateness even of voluntary actions owes nothing to the fact that consciousness attends them. They are, according to these writers, results of physiological mechanism pure and simple. In a near chapter we shall return to this controversy again. Let us now look a little more closely at the brain and at the ways in which its states may be supposed to condition those of the mind. [Pg 14]

THE FROG'S NERVE-CENTRES.

Both the minute anatomy and the detailed physiology of the brain are achievements of the present generation, or rather we may say (beginning with Meynert) of the past twenty years. Many points are still obscure and subject to controversy; but a general way of conceiving the organ has been reached on all hands which in its main feature seems not unlikely to stand, and which even gives a most plausible scheme of the way in which cerebral and mental operations go hand in hand.

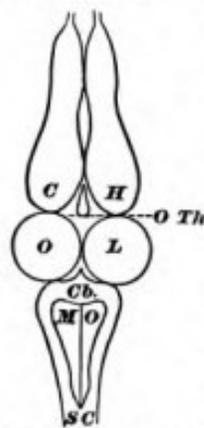


FIG. 1.—C H, cerebral Hemispheres; O Th, Optic Thalami; O L, Optic Lobes; Cb, Cerebellum; M O, Medulla Oblongata; S C, Spinal cord.

The best way to enter the subject will be to take a lower creature, like a frog, and study by the vivisectional method the functions of his different nerve-centres. The frog's nerve-centres are figured in the accompanying diagram, which needs no further explanation. I will first proceed to state what happens when various amounts of the anterior parts are removed, in different frogs, in the way in which an ordinary student removes them; that is, with no extreme precautions as to the purity of the operation. We shall in this way reach a very simple conception of the functions of the various centres, involving the strongest possible contrast between the cerebral hemispheres and the lower lobes. This sharp conception will have didactic advantages, for it is often very instructive to start with too simple a formula and correct it later on. Our first formula, as we shall later see, will have to be softened down somewhat by the results of more careful experimentation both on frogs and birds, and by those of the most recent observations on dogs, monkeys, and man. But it will put us, from the outset, in clear possession of some fundamental notions and distinctions which we could otherwise not gain so well, and none of which the later more completed view will overturn. [Pg 15]

If, then, we reduce the frog's nervous system to the spinal cord alone, by making a section behind the base of the skull, between the spinal cord and the medulla oblongata, thereby cutting off the brain from all connection with the rest of the body, the frog will still continue to live, but with a very peculiarly modified activity. It ceases to breathe or swallow; it lies flat on its belly, and does not, like a normal frog, sit up on its fore paws, though its hind legs are kept, as usual, folded against its body and immediately resume this position if drawn out. If thrown on its back, it lies there quietly, without turning over like a normal frog. Locomotion and voice seem entirely abolished. If we suspend it by the nose, and irritate different portions of its skin by acid, it performs a set of remarkable 'defensive' movements calculated to wipe away the

irritant. Thus, if the breast be touched, both fore paws will rub it vigorously; if we touch the outer side of the elbow, the hind foot of the same side will rise directly to the spot and wipe it. The back of the foot will rub the knee if that be attacked, whilst if the foot be cut away, the stump will make ineffectual movements, and then, in many frogs, a pause will come, as if for deliberation, succeeded by a rapid passage of the opposite unamputated foot to the acidulated spot.

The most striking character of all these movements, after their teleological appropriateness, is their precision. They vary, in sensitive frogs and with a proper amount of irritation, so little as almost to resemble in their machine-like regularity the performances of a jumping-jack, whose legs must twitch whenever you pull the string. The spinal cord of the frog thus contains arrangements of cells and fibres fitted to convert skin irritations into movements of defence. We may call it the *centre for defensive movements* in this animal. We may indeed go farther than this, and by cutting the spinal cord in various places find that its separate segments are independent mechanisms, for appropriate activities of the head and of the arms and legs respectively. The segment governing the arms is especially active, in male frogs, in the breeding season; and these members alone with the breast and back appertaining to them, everything else being cut away, will then actively grasp a finger placed between them and remain hanging to it for a considerable time.

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The spinal cord in other animals has analogous powers. Even in man it makes movements of defence. Paraplegics draw up their legs when tickled; and Robin, on tickling the breast of a criminal an hour after decapitation, saw the arm and hand move towards the spot. Of the lower functions of the mammalian cord, studied so ably by Goltz and others, this is not the place to speak.

If, in a second animal, the cut be made just behind the optic lobes so that the cerebellum and medulla oblongata remain attached to the cord, then swallowing, breathing, crawling, and a rather enfeebled jumping and swimming are added to the movements previously observed.

[4] There are other reflexes too. The animal, thrown on his back, immediately turns over to his belly. Placed in a shallow bowl, which is floated on water and made to rotate, he responds to the rotation by first turning his head and then waltzing around with his entire body, in the opposite direction to the whirling of the bowl. If his support be tilted so that his head points downwards, he points it up; he points it down if it be pointed upwards, to the right if it be pointed to the left, etc. But his reactions do not go farther than these movements of the head. He will not, like frogs whose thalami are preserved, climb up a board if the latter be tilted, but will slide off it to the ground.

If the cut be made on another frog between the thalami and the optic lobes, the locomotion both on land and water becomes quite normal, and, in addition to the reflexes already shown by the lower centres, he croaks regularly whenever he is pinched under the arms. He compensates rotations, etc., by movements of the head, and turns over from his back; but still drops off his tilted board. As his optic nerves are destroyed by the usual operation, it is impossible to say whether he will avoid obstacles placed in his path.

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When, finally, a frog's cerebral hemispheres alone are cut off by a section between them and the thalami which preserves the latter, an unpractised observer would not at first suspect anything abnormal about the animal. Not only is he capable, on proper instigation, of all the acts already described, but he guides himself by sight, so that if an obstacle be set up between him and the light, and he be forced to move forward, he either jumps over it or swerves to one side. He manifests sexual passion at the proper season, and, unlike an altogether brainless frog, which embraces anything placed between his arms, postpones this reflex act until a female of his own species is provided. Thus far, as aforesaid, a person unfamiliar with frogs might not suspect a mutilation; but even such a person would soon remark the almost entire absence of spontaneous motion—that is, motion unprovoked by any *present* incitation of sense. The continued movements of swimming, performed by the creature in the water, seem to be the fatal result of the contact of that fluid with its skin.

They cease when a stick, for example, touches his hands. This is a sensible irritant towards which the feet are automatically drawn by reflex action, and on which the animal remains sitting. He manifests no hunger, and will suffer a fly to crawl over his nose unsnapped at. Fear, too, seems to have deserted him. In a word, he is an extremely complex machine whose actions, so far as they go, tend to self-preservation; but still a *machine*, in this sense —that it seems to contain no incalculable element. By applying the right sensory stimulus to him we are almost as certain of getting a fixed response as an organist is of hearing a certain tone when he pulls out a certain stop.

But now if to the lower centres we add the cerebral hemispheres, or if, in other words, we make an intact animal the subject of our observations, all this is changed. In addition to the previous responses to present incitements of sense, our frog now goes through long and complex acts of locomotion *spontaneously*, or as if moved by what in ourselves we should call an idea. His reactions to outward stimuli vary their form, too. Instead of making simple defensive movements with his hind legs like a headless frog if touched, or of giving one or two leaps and then sitting still like a hemisphereless one, he makes persistent and varied efforts at escape, as if, not the mere contact of the physiologist's hand, but the notion of danger suggested by it were now his spur. Led by the feeling of hunger, too, he goes in search of insects, fish, or smaller frogs, and varies his procedure with each species of victim. The physiologist cannot by manipulating him elicit croaking, crawling up a board, swimming or stopping, at will. His conduct has become incalculable. We can no longer foretell it exactly. Effort to escape is his dominant reaction, but he *may* do anything else, even swell up and become perfectly passive in our hands.

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Such are the phenomena commonly observed, and such the impressions which one naturally receives. Certain general conclusions follow irresistibly. First of all the following:

The acts of all the centres involve the use of the same muscles. When a headless frog's hind leg wipes the acid, he calls into play all the leg-muscles which a frog with his full medulla oblongata and cerebellum uses when he turns from his back to his belly. Their contractions are, however, *combined* differently in the two cases, so that the results vary widely. We must consequently conclude that specific arrangements of cells and fibres exist in the cord for wiping, in the medulla for turning over, etc. Similarly they exist in the thalami for jumping over seen obstacles and for balancing the moved body; in the optic lobes for creeping backwards, or what not. But in the hemispheres, since the presence of these organs *brings no new elementary form of movement* with it, but only *determines differently the occasions* on which the movements shall occur, making the usual stimuli less fatal and machine-like; we need suppose no such machinery *directly* co-ordinative of muscular contractions to exist. We may rather assume, when the mandate for a wiping-movement is sent forth by the hemispheres, that a current goes straight to the wiping-arrangement in the spinal cord, exciting this arrangement as a whole. Similarly, if an intact frog wishes to jump over a stone which he sees, all he need do is to excite from the hemispheres the jumping-centre in the thalami or wherever it may be, and the latter will provide for the details of the execution. It is like a general ordering a colonel to make a certain movement, but not telling him how it shall be done.^[5]

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The same muscle, then, is repeatedly represented at different heights; and at each it enters into a different combination with other muscles to co-operate in some special form of concerted movement. *At each height the movement is discharged by some particular form of sensorial stimulus.* Thus in the cord, the skin alone occasions movements; in the upper part of the optic lobes, the eyes are added; in the thalami, the semi-circular canals would seem to play a part; whilst the stimuli which discharge the hemispheres would seem not so much to be elementary sorts of sensation, as groups of sensations forming determinate *objects* or

things. Prey is not pursued nor are *enemies* shunned by ordinary hemisphereless frogs. Those reactions upon complex circumstances which we call instinctive rather than reflex, are already in this animal dependent on the brain's highest lobes, and still more is this the case with animals higher in the zoological scale.

The results are just the same if, instead of a frog, we take a pigeon, and cut out his hemispheres as they are ordinarily cut out for a lecture-room demonstration. There is not a movement natural to him which this brainless bird cannot perform if expressly excited thereto; only the inner promptings seem deficient, and when left to himself he spends most of his time crouched on the ground with his head sunk between his shoulders as if asleep.

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GENERAL NOTION OF HEMISPHERES.

All these facts lead us, when we think about them, to some such explanatory conception as this: *The lower centres act from present sensational stimuli alone; the hemispheres act from perceptions and considerations*, the sensations which they may receive serving only as suggesters of these. But what are perceptions but sensations grouped together? and what are considerations but expectations, in the fancy, of sensations which will be felt one way or another according as action takes this course or that? If I step aside on seeing a rattlesnake, from considering how dangerous an animal he is, the mental materials which constitute my prudential reflection are images more or less vivid of the movement of his head, of a sudden pain in my leg, of a state of terror, a swelling of the limb, a chill, delirium, unconsciousness, etc., etc., and the ruin of my hopes. But all these images are constructed out of my past experiences. They are *reproductions* of what I have felt or witnessed. They are, in short, *remote* sensations; and the *difference between the hemisphereless animal and the whole one* may be concisely expressed by saying that the *one obeys absent, the other only present, objects*.

The hemispheres would then seem to be *the seat of memory*. Vestiges of past experience must in some way be stored up in them, and must, when aroused by present stimuli, first appear as representations of distant goods and evils; and then must discharge into the appropriate motor channels for warding off the evil and securing the benefits of the good. If we liken the nervous currents to electric currents, we can compare the nervous system, *C*, below the hemispheres to a direct circuit from sense-organ to muscle along the line *S ... C ... M* of Fig. 2. The hemisphere, *H*, adds the long circuit or loop-line through which the current may pass when for any reason the direct line is not used.

Thus, a tired wayfarer on a hot day throws himself on the damp earth beneath a maple-tree. The sensations of delicious rest and coolness pouring themselves through the direct line would naturally discharge into the muscles of complete extension: he would abandon himself to the dangerous repose. But the loop-line being open, part of the current is drafted along it, and awakens rheumatic or catarrhal reminiscences, which prevail over the instigations of sense, and make the man arise and pursue his way to where he may enjoy his rest more safely. Presently we shall examine the manner in which the hemispheric loop-line may be supposed to serve as a reservoir for such reminiscences as these. Meanwhile I will ask the reader to notice some corollaries of its being such a reservoir.

[Pg 21]

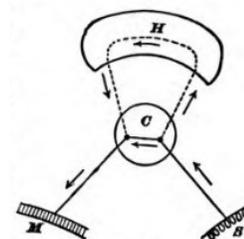


FIG. 2.

First, no animal without it can deliberate, pause, postpone, nicely weigh one motive against another, or compare. Prudence, in a word, is for such a creature an impossible virtue. Accordingly we see that nature removes those functions in the exercise of which prudence is a virtue from the lower centres and hands them over to the cerebrum. Wherever a creature has to deal with complex features of the environment, prudence is a virtue. The higher animals have so to deal; and the more complex the features, the higher we call the animals.

The fewer of his acts, then, can *such* an animal perform without the help of the organs in question. In the frog many acts devolve wholly on the lower centres; in the bird fewer; in the rodent fewer still; in the dog very few indeed; and in apes and men hardly any at all.

The advantages of this are obvious. Take the prehension of food as an example and suppose it to be a reflex performance of the lower centres. The animal will be condemned fatally and irresistibly to snap at it whenever presented, no matter what the circumstances may be; he can no more disobey this prompting than water can refuse to boil when a fire is kindled under the pot. His life will again and again pay the forfeit of his gluttony. Exposure to retaliation, to other enemies, to traps, to poisons, to the dangers of repletion, must be regular parts of his existence. His lack of all thought by which to weigh the danger against the attractiveness of the bait, and of all volition to remain hungry a little while longer, is the direct measure of his lowness in the mental scale. And those fishes which, like our cunners and sculpins, are no sooner thrown back from the hook into the water, than they automatically seize the hook again, would soon expiate the degradation of their intelligence by the extinction of their type, did not their exaggerated fecundity atone for their imprudence. Appetite and the acts it prompts have consequently become in all higher vertebrates functions of the cerebrum. They disappear when the physiologist's knife has left the subordinate centres alone in place. The brainless pigeon will starve though left on a corn-heap.

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Take again the sexual function. In birds this devolves exclusively upon the hemispheres. When these are shorn away the pigeon pays no attention to the billings and cooings of its mate. And Goltz found that a bitch in heat would excite no emotion in male dogs who had suffered large loss of cerebral tissue. Those who have read Darwin's 'Descent of Man' know what immense importance in the amelioration of the breed in birds this author ascribes to the mere fact of sexual selection. The sexual act is not performed until every condition of circumstance and sentiment is fulfilled, until time, place, and partner all are fit. But in frogs and toads this passion devolves on the lower centres. They show consequently a machine-like obedience to the present incitement of sense, and an almost total exclusion of the power of choice. Copulation occurs *per fas aut nefas*, occasionally between males, often with dead females, in puddles exposed on the highway, and the male may be cut in two without letting go his hold. Every spring an immense sacrifice of batrachian life takes place from these causes alone.

No one need be told how dependent all human social elevation is upon the prevalence of chastity. Hardly any factor measures more than this the difference between civilisation and barbarism. Physiologically interpreted, chastity means nothing more than the fact that present solicitations of sense are overpowered by suggestions of æsthetic and moral fitness which the circumstances awaken in the cerebrum; and that upon the inhibitory or permissive influence of these alone action directly depends.

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Within the psychic life due to the cerebrum itself the same general distinction obtains, between considerations of the more immediate and considerations of the more remote. In all ages the man whose determinations are swayed by reference to the most distant ends has been held to possess the highest intelligence. The tramp who lives from hour to hour; the bohemian whose engagements are from day to day; the bachelor who builds but for a single life; the father who acts for another generation; the patriot who thinks of a whole community and many generations; and finally, the philosopher and saint whose cares are for humanity and for eternity,—these range themselves in an unbroken hierarchy, wherein each successive grade results from an increased manifestation of the special form of action by which the cerebral centres are distinguished from all below them.

In the 'loop-line' along which the memories and ideas of the distant are supposed to lie, the action, so far as it is a physical process, must be interpreted after the type of the action in the lower centres. If regarded here as a reflex process, it must be reflex there as well. The current in both places runs out into the muscles only after it has first run in; but whilst the

path by which it runs out is determined in the lower centres by reflections few and fixed amongst the cell-arrangements, in the hemispheres the reflections are many and instable. This, it will be seen, is only a difference of degree and not of kind, and does not change the reflex type. The conception of *all* action as conforming to this type is the fundamental conception of modern nerve-physiology. So much for our general preliminary conception of the nerve-centres! Let us define it more distinctly before we see how well physiological observation will bear it out in detail.

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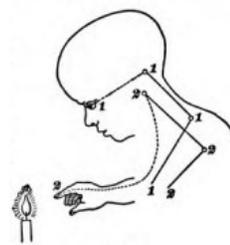
THE EDUCATION OF THE HEMISPHERES.

Nerve-currents run in through sense-organs, and whilst provoking reflex acts in the lower centres, they arouse ideas in the hemispheres, which either permit the reflexes in question, check them, or substitute others for them. All ideas being in the last resort reminiscences, the question to answer is: *How can processes become organized in the hemispheres which correspond to reminiscences in the mind?*^[6]

Nothing is easier than to conceive a *possible* way in which this might be done, provided four assumptions be granted. These assumptions (which after all are inevitable in any event) are:

- 1) The same cerebral process which, when aroused from without by a sense-organ, gives the perception of an object, will give an *idea* of the same object when aroused by other cerebral processes from within.
- 2) If processes 1, 2, 3, 4 have once been aroused together or in immediate succession, any subsequent arousal of any one of them (whether from without or within) will tend to arouse the others in the original order. [This is the so-called law of association.]
- 3) Every sensorial excitement propagated to a lower centre tends to spread upwards and arouse an idea.
- 4) Every idea tends ultimately either to produce a movement or to check one which otherwise would be produced.

Suppose now (these assumptions being granted) that we have a baby before us who sees a candle-flame for the first time, and, by virtue of a reflex tendency common in babies of a certain age, extends his hand to grasp it, so that his fingers get burned. So far we have two reflex currents in play: first, from the eye to the extension movement, along the line 1—1—1—1 of Fig. 3; and second, from the finger to the movement of drawing back the hand, along the line 2—2—2—2. If this were the baby's whole nervous system, and if the reflexes were once for all organic, we should have no alteration in his behavior, no matter how often the experience recurred. The retinal image of the flame would always make the arm shoot forward, the burning of the finger would always send it back. But we know that 'the burnt child dreads the fire,' and that one experience usually protects the fingers forever. The point is to see how the hemispheres may bring this result to pass.



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FIG. 3.

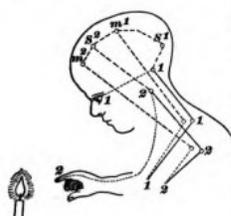


FIG. 4.—The dotted lines stand

We must complicate our diagram (see Fig. 4). Let the current 1—1, from the eye, discharge upward as well as downward when it reaches the lower centre for vision, and arouse the perceptual process s^1 in the hemispheres; let the feeling of the arm's extension also send up a current which leaves a trace of itself, m^1 ; let the burnt finger leave an analogous trace, s^2 ; and let the movement of retraction leave m^2 . These four processes will now, by virtue of assumption 2), be associated together by the path $s^1-m^1-s^2-m^2$, running from the first to the last,

for afferent paths,
the broken lines
for paths between
the centres; the
entire lines for
efferent paths.

so that if anything touches off s^1 , ideas of the extension, of the burnt finger, and of the retraction will pass in rapid succession through the mind. The effect on the child's conduct when the candle-flame is next presented is easy to imagine. Of course the sight of it arouses the grasping reflex; but it arouses simultaneously the idea thereof, together with that of the consequent pain, and of the final retraction of the hand;

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and if these cerebral processes prevail in strength over the immediate sensation in the centres below, the last idea will be the cue by which the final action is discharged. The grasping will be arrested in mid-career, the hand drawn back, and the child's fingers saved.

In all this we assume that the hemispheres do not *natively* couple any particular sense-impression with any special motor discharge. They only register, and preserve traces of, such couplings as are already organized in the reflex centres below. But this brings it inevitably about that, when a chain of experiences has been already registered and the first link is impressed once again from without, the last link will often be awakened in *idea* long before it can exist in *fact*. And if this last link were previously coupled with a motion, that motion may now come from the mere ideal suggestion without waiting for the actual impression to arise. Thus an animal with hemispheres acts in *anticipation* of future things; or, to use our previous formula, he acts from considerations of distant good and ill. If we give the name of *partners* to the original couplings of impressions with motions in a reflex way, then we may say that the function of the hemispheres is simply to bring about *exchanges among the partners*. Movement m^n , which natively is sensation s^m 's partner, becomes through the hemispheres the partner of sensation s^1 , s^2 , or s^3 . It is like the great commutating switch-board at a central telephone station. No new elementary process is involved; no impression nor any motion peculiar to the hemispheres; but any number of combinations impossible to the lower machinery taken alone, and an endless consequent increase in the possibilities of behavior on the creature's part.

All this, as a mere scheme,^[7] is so clear and so concordant with the general look of the facts as almost to impose itself on our belief; but it is anything but clear in detail. The brain-physiology of late years has with great effort sought to work out the paths by which these couplings of sensations with movements take place, both in the hemispheres and in the centres below.

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So we must next test our scheme by the facts discovered in this direction. We shall conclude, I think, after taking them all into account, that the scheme probably makes the lower centres too machine-like and the hemispheres not quite machine-like enough, and must consequently be softened down a little. So much I may say in advance. Meanwhile, before plunging into the details which await us, it will somewhat clear our ideas if we contrast the modern way of looking at the matter with the *phrenological* conception which but lately preceded it.

THE PHRENOLOGICAL CONCEPTION.

In a certain sense Gall was the first to seek to explain in detail how the brain could subserve our mental operations. His way of proceeding was only too simple. He took the faculty-psychology as his ultimatum on the mental side, and he made no farther psychological analysis. Wherever he found an individual with some strongly-marked trait of character he examined his head; and if he found the latter prominent in a certain region, he said without more ado that that region was the 'organ' of the trait or faculty in question. The traits were of very diverse constitution, some being simple sensibilities like 'weight' or 'color;' some being instinctive tendencies like 'alimentiveness' or 'amativeness;' and others, again, being complex resultants like 'conscientiousness,' 'individuality.' Phrenology fell promptly into disrepute among scientific men because observation seemed to show that large faculties and

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large 'bumps' might fail to coexist; because the scheme of Gall was so vast as hardly to admit of accurate determination at all—who of us can say even of his own brothers whether their perceptions of *weight* and of *time* are well developed or not?—because the followers of Gall and Spurzheim were unable to reform these errors in any appreciable degree; and, finally, because the whole analysis of faculties was vague and erroneous from a psychologic point of view. Popular professors of the lore have nevertheless continued to command the admiration of popular audiences; and there seems no doubt that Phrenology, however little it satisfy our scientific curiosity about the functions of different portions of the brain, may still be, in the hands of intelligent practitioners, a useful help in the art of reading character. A hooked nose and a firm jaw are usually signs of practical energy; soft, delicate hands are signs of refined sensibility. Even so may a prominent eye be a sign of power over language, and a bull-neck a sign of sensuality. But the brain behind the eye and neck need no more be the *organ* of the signified faculty than the jaw is the organ of the will or the hand the organ of refinement. These correlations between mind and body are, however, so frequent that the 'characters' given by phrenologists are often remarkable for knowingness and insight.

Phrenology hardly does more than restate the problem. To answer the question, "Why do I like children?" by saying, "Because you have a large organ of philoprogenitiveness," but renames the phenomenon to be explained. What *is* my philoprogenitiveness? Of what mental elements does it consist? And how *can* a part of the brain be its organ? A science of the mind must reduce such complex manifestations as 'philoprogenitiveness' to their *elements*. A science of the brain must point out the functions of *its* elements. A science of the relations of mind and brain must show how the elementary ingredients of the former correspond to the elementary functions of the latter. But phrenology, except by occasional coincidence, takes no account of elements at all. Its 'faculties,' as a rule, are fully equipped persons in a particular mental attitude. Take, for example, the 'faculty' of language. It involves in reality a host of distinct powers. We must first have images of concrete things and ideas of abstract qualities and relations; we must next have the memory of words and then the capacity so to associate each idea or image with a particular word that, when the word is heard, the idea shall forthwith enter our mind. We must conversely, as soon as the idea arises in our mind, associate with it a mental image of the word, and by means of this image we must innervate our articulatory apparatus so as to reproduce the word as physical sound. To read or to write a language other elements still must be introduced. But it is plain that the faculty of spoken language alone is so complicated as to call into play almost all the elementary powers which the mind possesses, memory, imagination, association, judgment, and volition. A portion of the brain competent to be the adequate seat of such a faculty would needs be an entire brain in miniature,—just as the faculty itself is really a specification of the entire man, a sort of homunculus.

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Yet just such homunculi are for the most part the phrenological organs. As Lange says:

"We have a parliament of little men together, each one of whom, as happens also in a real parliament, possesses but a single idea which he ceaselessly strives to make prevail"—benevolence, firmness, hope, and the rest. "Instead of one soul, phrenology gives us forty, each alone as enigmatic as the full aggregate psychic life can be. Instead of dividing the latter into effective elements, she divides it into personal beings of peculiar character.... 'Herr Pastor, sure there be a horse inside,' called out the peasants to X after their spiritual shepherd had spent hours in explaining to them the construction of the locomotive. With a horse inside truly everything becomes clear, even though it be a queer enough sort of horse—the horse itself calls for no explanation! Phrenology takes a start to get beyond the point of view of the ghost-like soul entity, but she ends by populating the whole skull with ghosts of the same order."^[8]

Modern Science conceives of the matter in a very different way. *Brain and mind alike consist of simple elements, sensory and motor.* "All nervous centres," says Dr. Hughlings Jackson,^[9] "from the lowest to the very highest (the substrata of consciousness), are made up of nothing else than nervous arrangements, representing impressions and movements.... I do not see of what other materials the brain *can* be made." Meynert represents the matter similarly when he calls the cortex of the hemispheres the surface of projection for every muscle and every sensitive point of the body. The muscles and the sensitive points are *represented* each by a cortical point, and the brain is nothing but the sum of all these cortical points, to which, on the mental side, as many *ideas* correspond. *Ideas of sensation, ideas of motion* are, on the other hand, *the elementary factors out of which the mind is built up by the associationists in psychology.* There is a complete parallelism between the two analyses, the same diagram of little dots, circles, or triangles joined by lines symbolizes equally well the cerebral and mental processes: the dots stand for cells or ideas, the lines for fibres or associations. We shall have later to criticise this analysis so far as it relates to the mind; but there is no doubt that it is a most convenient, and has been a most useful, hypothesis, formulating the facts in an extremely natural way.

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If, then, we grant that motor and sensory ideas variously associated are the materials of the mind, all we need do to get a complete diagram of the mind's and the brain's relations should be to ascertain which sensory idea corresponds to which sensational surface of projection, and which motor idea to which muscular surface of projection. The associations would then correspond to the fibrous connections between the various surfaces. This distinct *cerebral localization* of the various elementary sorts of idea has been treated as a 'postulate' by many physiologists (e.g. Munk); and the most stirring controversy in nerve-physiology which the present generation has seen has been the *localization-question*.

THE LOCALIZATION OF FUNCTIONS IN THE HEMISPHERES.

Up to 1870, the opinion which prevailed was that which the experiments of Flourens on pigeons' brains had made plausible, namely, that the different functions of the hemispheres were not locally separated, but carried on each by the aid of the whole organ. Hitzig in 1870 showed, however, that in a dog's brain highly specialized movements could be produced by electric irritation of determinate regions of the cortex; and Ferrier and Munk, half a dozen years later, seemed to prove, either by irritations or excisions or both, that there were equally determinate regions connected with the senses of sight, touch, hearing, and smell. Munk's special sensorial localizations, however, disagreed with Ferrier's; and Goltz, from his extirpation-experiments, came to a conclusion adverse to strict localization of any kind. The controversy is not yet over. I will not pretend to say anything more of it historically, but give a brief account of the condition in which matters at present stand.

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The one thing which is *perfectly* well established is this, that the 'central' convolutions, on either side of the fissure of Rolando, and (at least in the monkey) the calloso-marginal convolution (which is continuous with them on the mesial surface where one hemisphere is applied against the other), form the region by which all the motor incitations which leave the cortex pass out, on their way to those executive centres in the region of the pons, medulla, and spinal cord from which the muscular contractions are discharged in the last resort. The existence of this so-called 'motor zone' is established by the lines of evidence successively given below:

(1) *Cortical Irritations.* Electrical currents of small intensity applied to the surface of the said convolutions in dogs, monkeys, and other animals, produce well-defined movements in face, fore-limb, hind-limb, tail, or trunk, according as one point or another of the surface is irritated. These movements affect almost invariably the side opposite to the brain irritations: If the left hemisphere be excited, the movement is of the right leg, side of face, etc. All the objections at first raised against the validity of these experiments have been overcome. The

movements are certainly not due to irritations of the base of the brain by the downward spread of the current, for: *a*) mechanical irritations will produce them, though less easily than electrical; *b*) shifting the electrodes to a point close by on the surface changes the movement in ways quite inexplicable by changed physical conduction of the current; *c*) if the cortical 'centre' for a certain movement be cut under with a sharp knife but left *in situ*, although the electric conductivity is physically unaltered by the operation, the physiological conductivity is gone and currents of the same strength no longer produce the movements which they did; *d*) the time-interval between the application of the electric stimulus to the cortex and the resultant movement is what it would be if the cortex acted physiologically and not merely physically in transmitting the irritation. It is namely a well-known fact that when a nerve-current has to pass through the spinal cord to excite a muscle by reflex action, the time is longer than if it passes directly down the motor nerve: the cells of the cord take a certain time to discharge. Similarly, when a stimulus is applied directly to the cortex the muscle contracts two or three hundredths of a second later than it does when the place on the cortex is cut away and the electrodes are applied to the white fibres below.^[10]

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(2) *Cortical Ablations*. When the cortical spot which is found to produce a movement of the fore-leg, in a dog, is excised (see spot 5 in Fig. 5), the leg in question becomes peculiarly affected. At first it seems paralyzed. Soon, however, it is used with the other legs, but badly. The animal does not bear his weight on it, allows it to rest on its dorsal surface, stands with it crossing the other leg, does not remove it if it hangs over the edge of a table, can no longer 'give the paw' at word of command if able to do so before the operation, does not use it for scratching the ground, or holding a bone as formerly, lets it slip out when running on a smooth surface or when shaking himself, etc., etc. Sensibility of all kinds seems diminished as well as motility, but of this I shall speak later on. Moreover the dog tends in voluntary movements to swerve towards the side of the brain-lesion instead of going straight forward. All these symptoms gradually decrease, so that even with a very severe brain-lesion the dog may be outwardly indistinguishable from a well dog after eight or ten weeks. Still, a slight chloroformization will reproduce the disturbances, even then. There is a certain appearance of ataxic in-coordination in the movements—the dog lifts his fore-feet high and brings them down with more strength than usual, and yet the trouble is not ordinary lack of co-ordination. Neither is there paralysis. The strength of whatever movements are made is as great as ever—dogs with extensive destruction of the motor zone can jump as high and bite as hard as ever they did, but they seem *less easily moved* to do *anything* with the affected parts. Dr. Loeb, who has studied the motor disturbances of dogs more carefully than any one, conceives of them *en masse* as effects of an increased inertia in all the processes of innervation towards the side opposed to the lesion. All such movements require an unwonted effort for their execution; and when only the normally usual effort is made they fall behind in effectiveness.^[11]

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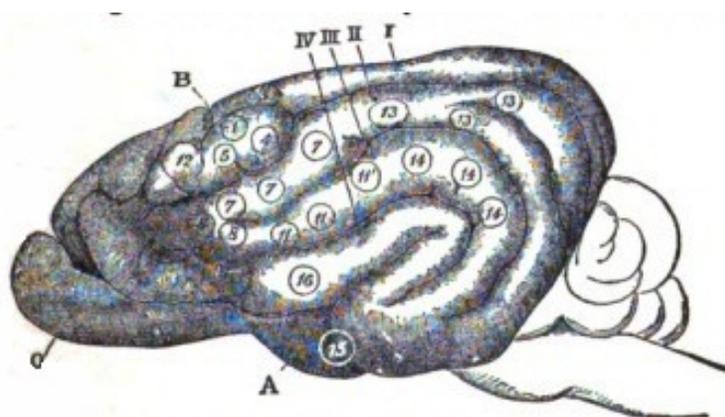


FIG. 5.—Left Hemisphere of Dog's Brain, after Ferrier. A, the fissure of Sylvius. B, the crucial sulcus. O, the olfactory bulb. I, II, III, IV, indicate the first, second, third, and fourth external

convolutions respectively. (1), (4), and (5) are on the *sigmoid gyrus*.

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FIG. 6.—Left Hemisphere of Monkey's Brain. Outer Surface.

Even when the entire motor zone of a dog is removed, there is no permanent paralysis of any part, but only this curious sort of relative inertia when the two sides of the body are compared; and this itself becomes hardly noticeable after a number of weeks have elapsed. Prof. Goltz has described a dog whose entire left hemisphere was destroyed, and who retained only a slight motor inertia on the right half of the body. In particular he could use his right paw for holding a bone whilst gnawing it, or for reaching after a piece of meat. Had he been taught to give his paw Before the operations, it would have been curious to see whether that faculty also came back. His tactile sensibility was permanently diminished on the right side.^[12] In *monkeys* a genuine paralysis follows upon ablations of the cortex in the motor region. This paralysis affects parts of the body which vary with the brain-parts removed. The monkey's opposite arm or leg hangs flaccid, or at most takes a small part in associated movements. When the entire region is removed there is a genuine and permanent hemiplegia in which the arm is more affected than the leg; and this is followed months later by contracture of the muscles, as in man after inveterate hemiplegia.^[13] According to Schaefer and Horsley, the trunk-muscles also become paralyzed after destruction of the *marginal* convolution on *both* sides (see Fig. 7). These differences between dogs and monkeys show the danger of drawing general conclusions from experiments done on any one sort of animal. I subjoin the figures given by the last-named authors of the motor regions in the monkey's brain.^[14]

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FIG. 7.—Left Hemisphere of Monkey's Brain. Mesial Surface.

In man we are necessarily reduced to the observation *post-mortem* of cortical ablations produced by accident or disease (tumor, hemorrhage, softening, etc.). What results during life from such conditions is either localized spasm, or palsy of certain muscles of the opposite side. The cortical regions which invariably produce these results are homologous with those which we have just been studying in the dog, cat, ape, etc. Figs. 8 and 9 show the result of 169 cases carefully studied by Exner. The parts shaded are regions where lesions produced *no* motor disturbance. Those left white were, on the contrary, never injured without motor disturbances of some sort. Where the injury to the cortical substance is profound in man, the paralysis is permanent and is succeeded by muscular rigidity in the paralyzed parts, just as it may be in the monkey.

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FIG. 8.—Right Hemisphere of Human Brain. Lateral Surface.

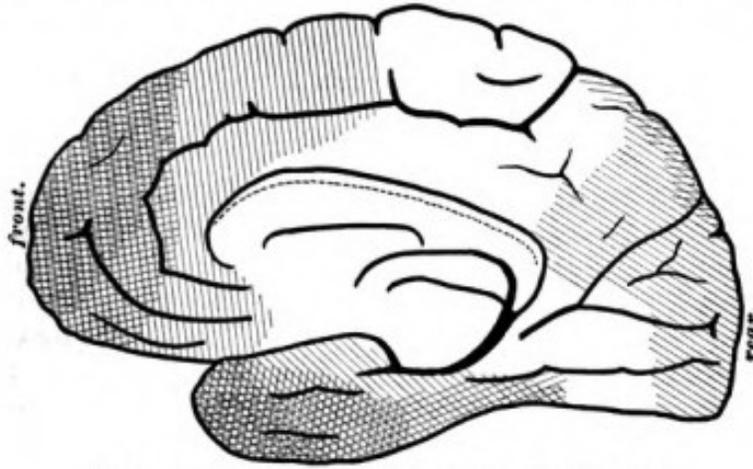


FIG. 9.—Right Hemisphere of Human Brain. Mesial Surface.

(3) *Descending degenerations* show the intimate connection of the rolandic regions of the cortex with the motor tracts of the cord. When, either in man or in the lower animals, these regions are destroyed, a peculiar degenerative change known as secondary sclerosis is found to extend downwards through the white fibrous substance of the brain in a perfectly definite manner, affecting certain distinct strands which pass through the inner capsule, crura, and pons, into the anterior pyramids of the medulla oblongata, and from thence (partly crossing to the other side) downwards into the anterior (direct) and lateral (crossed) columns of the spinal cord. [Pg 37]

(4) *Anatomical proof* of the continuity of the rolandic regions with these motor columns of the cord is also clearly given. Flechsig's 'Pyramidenbahn' forms an uninterrupted strand (distinctly traceable in human embryos, before its fibres have acquired their white 'medullary sheath') passing upwards from the pyramids of the medulla, and traversing the internal capsule and corona radiata to the convolutions in question (Fig. 10). None of the inferior gray matter of the brain seems to have any connection with this important fibrous strand. It passes directly from the cortex to the motor arrangements in the cord, depending for its proper nutrition (as the facts of degeneration show) on the influence of the cortical cells, just as motor nerves depend for their nutrition on that of the cells of the spinal cord. Electrical stimulation of this motor strand in any accessible part of its course has been shown in dogs to produce movements analogous to those which excitement of the cortical surface calls forth.

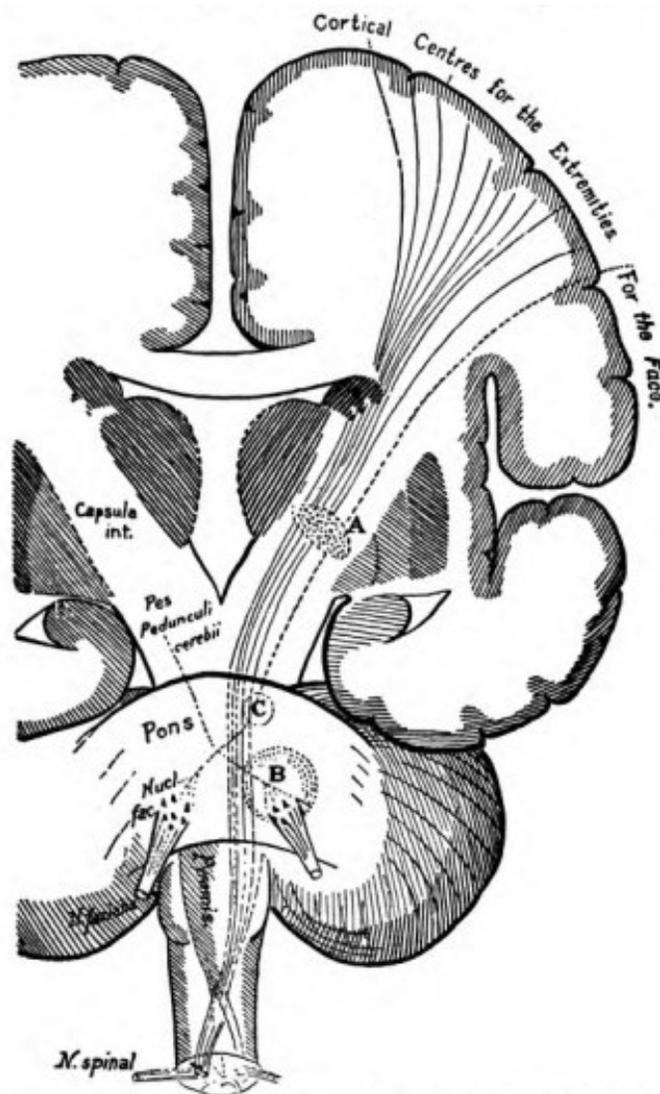


FIG. 10.—Schematic Transverse Section of Brain showing Motor Strand.—After Edinger.

One of the most instructive proofs of motor localization in the cortex is that furnished by the disease now called aphemia, or *motor Aphasia*. Motor aphasia is neither loss of voice nor paralysis of the tongue or lips. The patient's voice is as strong as ever, and all the innervations of his hypoglossal and facial nerves, except those necessary for speaking, may go on perfectly well. He can laugh and cry, and even sing; but he either is unable to utter any words at all; or a few meaningless stock phrases form his only speech; or else he speaks incoherently and confusedly, mispronouncing, misplacing, and misusing his words in various degrees. Sometimes his speech is a mere broth of unintelligible syllables. In cases of pure motor aphasia the patient recognizes his mistakes and suffers acutely from them. Now whenever a patient dies in such a condition as this, and an examination of his brain is permitted, it is found that the lowest frontal gyrus (see Fig. 11) is the seat of injury. Broca first noticed this fact in 1861, and since then the gyrus has gone by the name of Broca's convolution. The injury in right-handed people is found on the left hemisphere, and in left-handed people on the right hemisphere. Most people, in fact, are left-brained, that is, all their delicate and specialized movements are handed over to the charge of the left hemisphere. The ordinary right-handedness for such movements is only a consequence of that fact, a consequence which shows outwardly on account of that extensive decussation of the fibres whereby most of those from the left hemisphere pass to the right half of the body only. But the left-brainedness might exist in equal measure and not show outwardly. This would happen wherever organs on *both* sides of the body could be governed by the left hemisphere; and just such a case seems offered by the vocal organs, in that highly delicate

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and special motor service which we call speech. Either hemisphere *can* innervate them bilaterally, just as either seems able to innervate bilaterally the muscles of the trunk, ribs, and diaphragm. Of the special movements of speech, however, it would appear (from the facts of aphasia) that the left hemisphere in most persons habitually takes exclusive charge. With that hemisphere thrown out of gear, speech is undone; even though the opposite hemisphere still be there for the performance of less specialized acts, such as the various movements required in eating.

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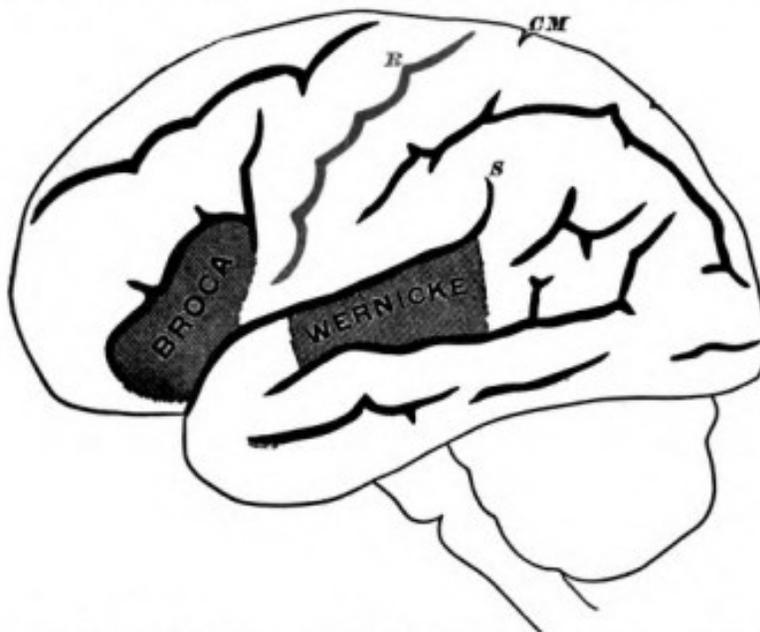


FIG. 11.—Schematic Profile of Left Hemisphere, with the parts shaded whose destruction causes motor ('Broca') and sensory ('Wernicke') Aphasia.

It will be noticed that Broca's region is homologous with the parts ascertained to produce movements of the lips, tongue, and larynx when excited by electric currents in apes (cf. Fig. 6). The evidence is therefore as complete as it well can be that the motor incitations to these organs leave the brain by the lower frontal region.

Victims of motor aphasia generally have other disorders. One which interests us in this connection has been called *agraphia*: they have lost the power to *write*. They can read writing and understand it; but either cannot use the pen at all or make egregious mistakes with it. The seat of the lesion here is less well determined, owing to an insufficient number of good cases to conclude from.^[15] There is no doubt, however, that it is (in right-handed people) on the left side, and little doubt that it consists of elements of the hand-and-arm region specialized for that service. The symptom may exist when there is little or no disability in the hand for other uses. If it does not get well, the patient usually educates his right hemisphere, i.e. learns to write with his left hand. In other cases of which we shall say more a few pages later on, the patient can write both spontaneously and at dictation, but cannot *read* even what he has himself written! All these phenomena are now quite clearly explained by separate brain-centres for the various feelings and movements and tracts for associating these together. But their minute discussion belongs to medicine rather than to general psychology, and I can only use them here to illustrate the principles of motor localization.^[16] Under the heads of sight and hearing I shall have a little more to say.

The different lines of proof which I have taken up establish conclusively the proposition that *all the motor impulses which leave the cortex pass out, in healthy animals, from the convolutions about the fissure of Rolando.*

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When, however, it comes to defining precisely what is involved in a motor impulse leaving the cortex, things grow more obscure. Does the impulse start independently from the

convolutions in question, or does it start elsewhere and merely flow through? And to what particular phase of psychic activity does the activity of these centres correspond? Opinions and authorities here divide; but it will be better, before entering into these deeper aspects of the problem, to cast a glance at the facts which have been made out concerning the relations of the cortex to sight, hearing, and smell.

Sight.

Ferrier was the first in the field here. He found, when the *angular* convolution (that lying between the 'intra parietal' and 'external occipital' fissures, and bending round the top of the fissure of Sylvius, in Fig. 6) was excited in the monkey, that movements of the eyes and head as if for vision occurred; and that when it was extirpated, what he supposed to be total and permanent blindness of the opposite eye followed. Munk almost immediately declared total and permanent blindness to follow from destruction of the *occipital lobe* in monkeys as well as dogs, and said that the angular gyrus had nothing to do with sight, but was only the centre for tactile sensibility of the eyeball. Hunk's absolute tone about his observations and his theoretic arrogance have led to his ruin as an authority. But he did two things of permanent value. He was the first to distinguish in these vivisections between sensorial and *psychic* blindness, and to describe the phenomenon of *restitution* of the visual function after its first impairment by an operation; and the first to notice the *hemiopic* character of the visual disturbances which result when only one hemisphere is injured. Sensorial blindness is absolute insensibility to light; psychic blindness is inability to recognize the *meaning* of the optical impressions, as when we see a page of Chinese print but it suggests nothing to us. A hemiopic disturbance of vision is one in which neither retina is affected in its totality, but in which, for example, the left portion of *each* retina is blind, so that the animal sees nothing situated in space towards its right. Later observations have corroborated this hemiopic character of all the disturbances of sight from injury to a single hemisphere in the higher animals; and the question whether an animal's apparent blindness is sensorial or only psychic has, since Munk's first publications, been the most urgent one to answer, in all observations relative to the function of sight.

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Goltz almost simultaneously with Ferrier and Munk reported experiments which led him to deny that the visual function was essentially bound up with any one localized portion of the hemispheres. Other divergent results soon came in from many quarters, so that, without going into the history of the matter any more, I may report the existing state of the case as follows:^[17]

In *fishes, frogs, and lizards* vision persists when the hemispheres are entirely removed. This is admitted for frogs and fishes even by Munk, who denies it for birds.

All of Munk's *birds* seemed totally blind (blind sensorially) after removal of the hemispheres by his operation. The following of a candle by the head and winking at a threatened blow, which are ordinarily held to prove the retention of crude optical sensations by the lower centres in supposed hemisphereless pigeons, are by Munk ascribed to vestiges of the visual sphere of the cortex left behind by the imperfection of the operation. But Schrader, who operated after Munk and with every apparent guarantee of completeness, found that all his pigeons saw after two or three weeks had elapsed, and the inhibitions resulting from the wound had passed away. They invariably avoided even the slightest obstacles, flew very regularly towards certain perches, etc., differing *toto cælo* in these respects with certain simply *blinded* pigeons who were kept with them for comparison. They did not pick up food strewn on the ground, however. Schrader found that they would do this if even a small part of the frontal region of the hemispheres was left, and ascribes their non-self-feeding when deprived of their occipital cerebrum not to a visual, but to a motor, defect, a sort of alimentary aphasia.^[18]

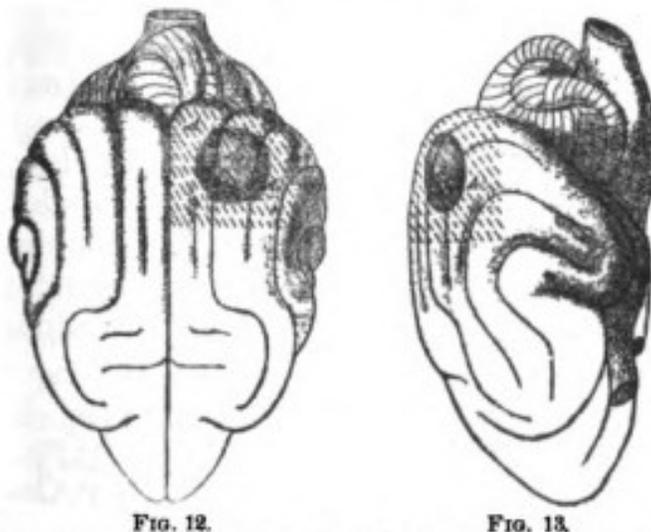
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In presence of such discord as that between Munk and his opponents one must carefully note how differently significant is *loss*, from *preservation*, of a function after an operation on the brain. The *loss* of the function does not necessarily show that it *is* dependent on the part cut out; but its *preservation* does show that it is *not* dependent: and this is true though the loss should be observed ninety-nine times and the preservation only once in a hundred similar excisions. That birds and mammals *can* be blinded by cortical ablation is undoubted; the only question is, *must* they be so? Only then can the cortex be certainly called the 'seat of sight.' The blindness may always be due to one of those remote effects of the wound on distant parts, inhibitions, extensions of inflammation,—interferences, in a word,—upon which Brown-Séguard and Goltz have rightly insisted, and the importance of which becomes more manifest every day. Such effects are transient; whereas the *symptoms of deprivation* (*Ausfallserscheinungen*, as Goltz calls them) which come from the actual loss of the cut-out region must from the nature of the case be permanent. Blindness in the pigeons, *so far as it passes away*, cannot possibly be charged to their seat of vision being lost, but only to some influence which temporarily depresses the activity of that seat. The same is true *mutatis mutandis* of all the other effects of operations, and as we pass to mammals we shall see still more the importance of the remark.

In rabbits loss of the entire cortex seems compatible with the preservation of enough sight to guide the poor animals' movements, and enable them to avoid obstacles. Christiani's observations and discussions seem conclusively to have established this, although Munk found that all *his* animals were made totally blind.^[19]

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In dogs also Munk found absolute stone-blindness after ablation of the occipital lobes. He went farther and mapped out determinate portions of the cortex thereupon, which he considered correlated with definite segments of the two retinae, so that destruction of given portions of the cortex produces blindness of the retinal centre, top, bottom, or right or left side, of the same or opposite eye. There seems little doubt that this definite correlation is mythological. Other observers, Hitzig, Goltz, Luciani, Loeb, Exner, etc., find, whatever part of the cortex may be ablated on one side, that there usually results a *hemiopic* disturbance of *both* eyes, slight and transient when the anterior lobes are the parts attacked, grave when an occipital lobe is the seat of injury, and lasting in proportion to the latter's extent. According to Loeb, the defect is a dimness of vision ('hemiamblyopia') in which (however severe) the centres remain the best seeing portions of the retina, just as they are in normal dogs. The lateral or temporal part of each retina seems to be in exclusive connection with the cortex of its own side. The centre and nasal part of each seems, on the contrary, to be connected with the cortex of the opposite hemispheres. Loeb, who takes broader views than any one, conceives the hemiamblyopia as he conceives the motor disturbances, namely, as the expression of an increased inertia in the whole optical machinery, of which the result is to make the animal respond with greater effort to impressions coming from the half of space opposed to the side of the lesion. If a dog has right hemiamblyopia, say, and two pieces of meat are hung before him at once, he invariably turns first to the one on his left. But if the lesion be a slight one, *shaking* slightly the piece of meat on his right (this makes of it a stronger stimulus) makes him seize upon it first. If only one piece of meat be offered, he takes it, on whichever side it be.



FIGS. 12 and 13. The Dog's visual centre according to Munk, the entire striated region, A, A, being the exclusive seat of vision, and the dark central circle, A¹, being correlated with the retinal centre of the opposite eye.

When both occipital lobes are extensively destroyed total blindness may result. Munk maps out his 'Sehspähre' definitely, and says that blindness *must* result when the entire shaded part, marked A, A, in Figs. 12 and 13, is involved in the lesion. Discrepant reports of other observations he explains as due to incomplete ablation. Luciani, Goltz, and Lannegrace, however, contend that they have made complete bilateral extirpations of Munk's Sehspähre more than once, and found a sort of crude indiscriminating sight of objects to return in a few weeks.^[20] The question whether a dog is blind or not is harder to solve than would at first appear; for simply blinded dogs, in places to which they are accustomed, show little of their loss and avoid all obstacles; whilst dogs whose occipital lobes are gone may run against things frequently and yet see notwithstanding. The best proof that they may see is that which Goltz's dogs furnished: they carefully avoided, as it seemed, strips of sunshine or paper on the floor, as if they were solid obstacles. This no really blind dog would do. Luciani tested his dogs when hungry (a condition which sharpens their attention) by strewing pieces of meat and pieces of cork before them. If they went straight at them, they *saw*; and if they chose the meat and left the cork, they *saw discriminately*. The quarrel is very acrimonious; indeed the subject of localization of functions in the brain seems to have a peculiar effect on the temper of those who cultivate it experimentally. The amount of preserved vision which Goltz and Luciani report seems hardly to be worth considering, on the one hand; and on the other, Munk admits in his penultimate paper that out of 85 dogs he only 'succeeded' 4 times in his operation of producing complete blindness by complete extirpation of his 'Sehspähre'.^[21] The safe conclusion for *us* is that Luciani's diagram, Fig. 14, represents something like the truth. The occipital lobes are far more important for vision than any other part of the cortex, so that their complete destruction makes the animal almost blind. As for the crude sensibility to light which *may* then remain, nothing exact is known either about its nature or its seat.

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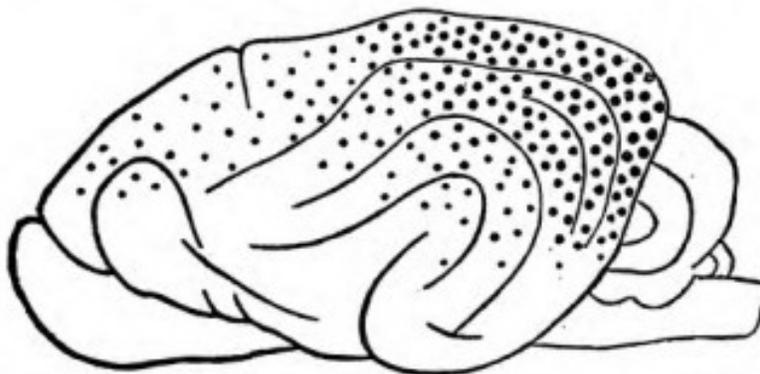


FIG. 14.—Distribution of the Visual Function in the Cortex, according to Luciani.

In the monkey, doctors also disagree. The truth seems, however, to be that the *occipital lobes* in this animal also are the part connected most intimately with the visual function. The function would seem to go on when very small portions of them are left, for Ferrier found no 'appreciable impairment' of it after almost complete destruction of them on both sides. On the other hand, he found complete and permanent blindness to ensue when they and the *angular gyri* in addition were destroyed on both sides. Munk, as well as Brown and Schaefer, found no disturbance of sight from destroying the *angular gyri* alone, although Ferrier found blindness to ensue. This blindness was probably due to inhibitions exerted *in distans*, or to cutting of the white optical fibres passing under the angular gyri on their way to the occipital lobes. Brown and Schaefer got complete and permanent blindness in one monkey from total destruction of both occipital lobes. Luciani and Seppili, performing this operation on two monkeys, found that the animals were only mentally, not sensorially, blind. After some weeks they saw their food, but could not distinguish by sight between figs and pieces of cork. Luciani and Seppili seem, however, not to have extirpated the entire lobes. When one lobe only is injured the affection of sight is hemiopic in monkeys: in this all observers agree. On the whole, then, Munk's original location of vision in the occipital lobes is confirmed by the later evidence.^[22]

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In man we have more exact results, since we are not driven to interpret the vision from the outward conduct. On the other hand, however, we cannot vivisect, but must wait for pathological lesions to turn up. The pathologists who have discussed these (the literature is tedious *ad libitum*) conclude that the occipital lobes are the indispensable part for vision in man. Hemiopic disturbance in both eyes comes from lesion of either one of them, and total blindness, sensorial as well as psychic, from destruction of both.

Hemiopia may also result from lesion in other parts, especially the neighboring angular and supra-marginal gyri, and it may accompany extensive injury in the motor region of the cortex. In these cases it seems probable that it is due to an *actio in distans*, probably to the interruption of fibres proceeding from the occipital lobe. There seem to be a few cases on record where there was injury to the occipital lobes without visual defect. Ferrier has collected as many as possible to prove his localization in the angular gyrus.^[23] A strict application of logical principles would make one of these cases outweigh one hundred contrary ones. And yet, remembering how imperfect observations may be, and how individual brains may vary, it would certainly be rash for their sake to throw away the enormous amount of positive evidence for the occipital lobes. Individual variability is always a *possible* explanation of an anomalous case. There is no more prominent anatomical fact than that of the 'decussation of the pyramids,' nor any more usual pathological fact than its consequence, that left-handed hemorrhages into the motor region produce right-handed paralyses. And yet the decussation is variable in amount, and seems sometimes to be absent altogether.^[24] If, in such a case as this last, the left brain were to become the seat of apoplexy, the left and not the right half of the body would be the one to suffer paralysis.

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certain articulatory movements. If the connection between the articulating or auditory centres, on the one hand, and the visual centres on the other, be ruptured we ought *a priori* to expect that the sight of words would fail to awaken the idea of their sound, or the movement for pronouncing them. We ought, in short, to have *alexia*, or inability to read: and this is just what we do have in many cases of extensive injury about the fronto-temporal regions, as a complication of *aphasic* disease. Nothnagel suggests that whilst the *cuneus* is the seat of optical *sensations*, the other parts of the occipital lobe may be the field of optical *memories and ideas*, from the loss of which mental blindness should ensue. In fact, all the medical authors speak of mental blindness as if it must consist in the loss of visual images from the memory. It seems to me, however, that this is a psychological misapprehension. A man whose power of visual imagination has decayed (no unusual phenomenon in its lighter grades) is not mentally blind in the least, for he recognizes perfectly all that he sees. On the other hand, he *may* be mentally blind, with his optical imagination well preserved; as in the interesting case published by Wilbrand in 1887.^[26] In the still more interesting case of mental blindness recently published by Lissauer,^[27] though the patient made the most ludicrous mistakes, calling for instance a clothes-brush a pair of spectacles, an umbrella a plant with flowers, an apple a portrait of a lady, etc. etc., he seemed, according to the reporter, to have his mental images fairly well preserved. It is in fact the momentary loss of our *non-optical* images which makes us mentally blind, just as it is that of our *non-auditory* images which makes us mentally deaf. I am mentally deaf if, *hearing* a bell, I can't recall how it *looks*; and mentally blind if, *seeing* it, I can't recall its *sound or its name*. As a matter of fact, I should have to be not merely mentally blind, but stone-blind, if all my visual images were lost. For although I am blind to the right half of the field of view if my left occipital region is injured, and to the left half if my right region is injured, such hemianopsia does not deprive me of visual *images*, experience seeming to show that the unaffected hemisphere is always sufficient for production of these. To abolish them entirely I should have to be deprived of both occipital lobes, and that would deprive me not only of my inward images of sight, but of my sight altogether.^[28] Recent pathological annals seem to offer a few such cases.^[29] Meanwhile there are a number of cases of mental blindness, especially for written language, coupled with hemianopsia, usually of the rightward field of view. These are all explicable by the breaking down, through disease, of the *connecting tracts* between the occipital lobes and other parts of the brain, especially those which go to the centres for speech in the frontal and temporal regions of the left hemisphere. They are to be classed among disturbances of *conduction* or of *association*; and nowhere can I find any fact which should force us to believe that optical images need^[30] be lost in mental blindness, or that the cerebral centres for such images are locally distinct from those for direct sensations from the eyes.^[31]

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Where an object fails to be recognized by sight, it often happens that the patient will recognize and name it as soon as he touches it with his hand. This shows in an interesting way how numerous the associative paths are which all end by running out of the brain through the channel of speech. The hand-path is open, though the eye-path be closed. When mental blindness is most complete, neither sight, touch, nor sound avails to steer the patient, and a sort of dementia which has been called *asymbolia* or *apraxia* is the result. The commonest articles are not understood. The patient will put his breeches on one shoulder and his hat upon the other, will bite into the soap and lay his shoes on the table, or take his food into his hand and throw it down again, not knowing what to do with it, etc. Such disorder can only come from extensive brain-injury.^[32]

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The *method of degeneration* corroborates the other evidence localizing the tracts of vision. In young animals one gets secondary degeneration of the occipital regions from destroying an eyeball, and, *vice versâ*, degeneration of the optic nerves from destroying the occipital regions. The corpora geniculata, thalami, and subcortical fibres leading to the occipital lobes are also found atrophied in these cases. The phenomena are not uniform, but are

indisputable;^[33] so that, taking all lines of evidence together, the special connection of vision with the occipital lobes is perfectly made out. It should be added, that the occipital lobes have frequently been found shrunken in cases of inveterate blindness in man.

Hearing.

Hearing is hardly as definitely localized as sight. *In the dog*, Luciani's diagram will show the regions which directly or indirectly affect it for the worse when injured. As with sight, one-sided lesions produce symptoms on both sides. The mixture of black dots and gray dots in the diagram is meant to represent this mixture of 'crossed' and 'uncrossed' connections, though of course no topographical exactitude is aimed at. Of all the region, the temporal lobe is the most important part; yet permanent absolute deafness did not result in a dog of Luciani's, even from bilateral destruction of both temporal lobes in their entirety.^[34]

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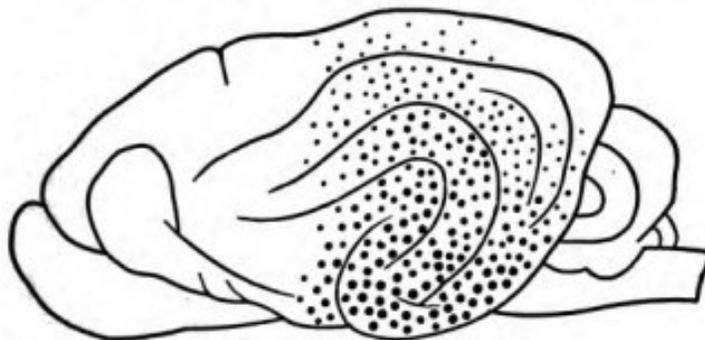


FIG. 16.—Luciani's Hearing Region.

In the monkey, Ferrier and Yeo once found permanent deafness to follow destruction of the upper temporal convolution (the one just below the fissure of Sylvius in Fig. 6) on both sides. Brown and Schaefer found, on the contrary, that in several monkeys this operation failed to noticeably affect the hearing. In one animal, indeed, both entire temporal lobes were destroyed. After a week or two of depression of the mental faculties this beast recovered and became one of the brightest monkeys possible, domineering over all his mates, and admitted by all who saw him to have all his senses, including hearing, 'perfectly acute.'^[35] Terrible recriminations have, as usual, ensued between the investigators, Ferrier denying that Brown and Schaefer's ablations were complete,^[36] Schaefer that Ferrier's monkey was really deaf.^[37] In this unsatisfactory condition the subject must be left, although there seems no reason to doubt that Brown and Schaefer's observation is the more important of the two.

In man the temporal lobe is unquestionably the seat of the hearing function, and the superior convolution adjacent to the sylvian fissure is its most important part. The phenomena of aphasia show this. We studied motor aphasia a few pages back; we must now consider *sensory aphasia*. Our knowledge of this disease has had three stages: we may talk of the period of Broca, the period of Wernicke, and the period of Charcot. What Broca's discovery was we have seen. Wernicke was the first to discriminate those cases in which the patient can *not even understand* speech from those in which he can understand, only not talk; and to ascribe the former condition to lesion of the temporal lobe.^[38] The condition in question is *word-deafness*, and the disease is *auditory aphasia*. The latest statistical survey of the subject is that by Dr. Allen Starr.^[39] In the seven cases of *pure* word-deafness which he has collected, cases in which the patient could read, talk, and write, but not understand what was said to him, the lesion was limited to the first and second temporal convolutions in their posterior two thirds. The lesion (in right-handed, i.e. left-brained, persons) is always on the left side, like the lesion in motor aphasia. Crude hearing would not be abolished, even were the left centre for it utterly destroyed; the right centre would still provide for that. But the

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linguistic use of hearing appears bound up with the integrity of the left centre more or less exclusively. Here it must be that words heard enter into association with the things which they represent, on the one hand, and with the movements necessary for pronouncing them, on the other. In a large majority of Dr. Starr's fifty cases, the power either to name objects or to talk coherently was impaired. This shows that in most of us (as Wernicke said) speech must go on from auditory cues; that is, it must be that our ideas do not innervate our motor centres directly, but only after first arousing the mental sound of the words. This is the immediate stimulus to articulation; and where the possibility of this is abolished by the destruction of its usual channel in the left temporal lobe, the articulation must suffer. In the few cases in which the channel is abolished with no bad effect on speech we must suppose an idiosyncrasy. The patient must innervate his speech-organs either from the corresponding portion of the other hemisphere or directly from the centres of ideation, those, namely, of vision, touch, etc., without leaning on the auditory region. It is the minuter analysis of the facts in the light of such individual differences as these which constitutes Charcot's contribution towards clearing up the subject.

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Every nameable thing, act, or relation has numerous properties, qualities, or aspects. In our minds the properties of each thing, together with its name, form an associated group. If different parts of the brain are severally concerned with the several properties, and a farther part with the hearing, and still another with the uttering, of the name, there must inevitably be brought about (through the law of association which we shall later study) such a dynamic connection amongst all these brain-parts that the activity of any one of them will be likely to awaken the activity of all the rest. When we are talking as we think, the *ultimate* process is that of utterance. If the brain-part for *that* be injured, speech is impossible or disorderly, even though all the other brain-parts be intact: and this is just the condition of things which, on [page 37](#), we found to be brought about by limited lesion of the left inferior frontal convolution. But back of that last act various orders of succession are possible in the associations of a talking man's ideas. The more usual order seems to be from the tactile, visual, or other properties of the things thought-about to the sound of their names, and then to the latter's utterance. But if in a certain individual the thought of the *look* of an object or of the *look* of its printed name be the process which habitually precedes articulation, then the loss of the *hearing* centre will *pro tanto* not affect that individual's speech. He will be mentally deaf, i.e. his *understanding* of speech will suffer, but he will not be aphasic. In this way it is possible to explain the seven cases of *pure* word-deafness which figure in Dr. Starr's table.

If this order of association be ingrained and habitual in that individual, injury to his *visual* centres will make him not only word-blind, but aphasic as well. His speech will become confused in consequence of an occipital lesion. Naunyn, consequently, plotting out on a diagram of the hemisphere the 71 irreproachably reported cases of aphasia which he was able to collect, finds that the lesions concentrate themselves in three places: first, on Broca's centre; second, on Wernicke's; third, on the supra-marginal and angular gyri under which those fibres pass which connect the visual centres with the rest of the brain^[40] (see Fig. 17). With this result Dr. Starr's analysis of purely sensory cases agrees.

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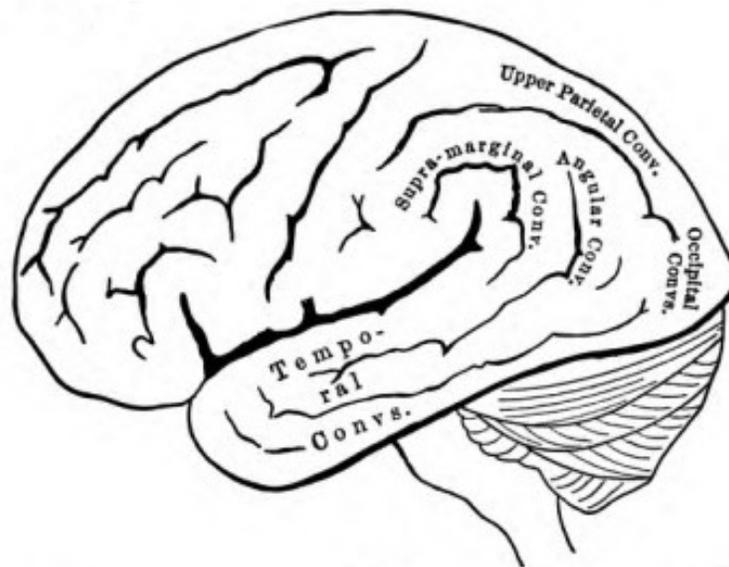


FIG. 17.

In a later chapter we shall again return to these differences in the effectiveness of the sensory spheres in different individuals. Meanwhile few things show more beautifully than the history of our knowledge of aphasia how the sagacity and patience of many banded workers are in time certain to analyze the darkest confusion into an orderly display.^[41] There is no 'centre of Speech' in the brain any more than there is a faculty of Speech in the mind. The entire brain, more or less, is at work in a man who uses language. The subjoined diagram, from Boss, shows the four parts most critically concerned, and, in the light of our text, needs no farther explanation (see Fig. 18).

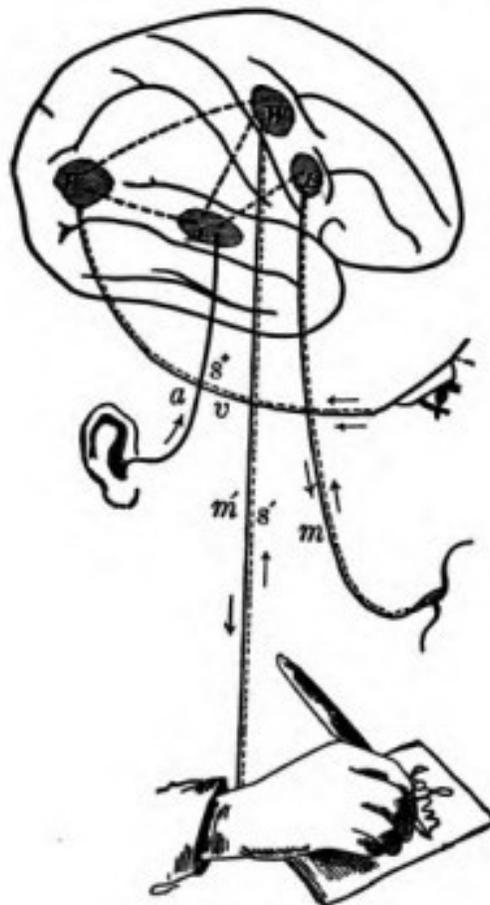


FIG. 18.

Smell.

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Everything conspires to point to the median descending part of the temporal lobes as being the organs of smell. Even Ferrier and Munk agree on the hippocampal gyrus, though Ferrier restricts olfaction, as Munk does not, to the lobule or uncinatè process of the convolution, reserving the rest of it for touch. Anatomy and pathology also point to the hippocampal gyrus; but as the matter is less interesting from the point of view of human psychology than were sight and hearing, I will say no more, but simply add Luciani and Seppili's diagram of the dog's smell-centre.^[42] Of

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Taste

we know little that is definite. What little there is points to the lower temporal regions again. Consult Ferrier as below.

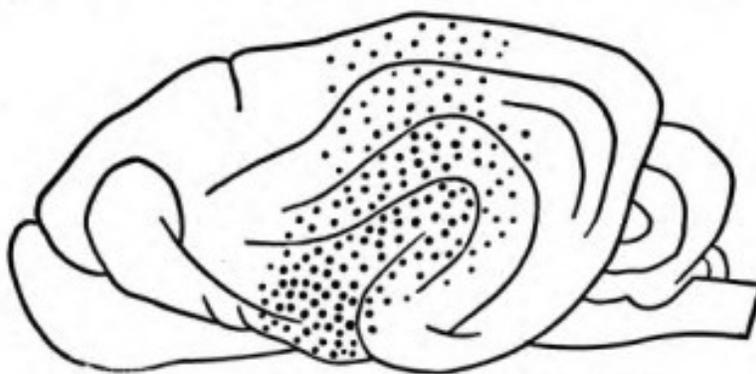


FIG. 19.—Luciani's Olfactory Region in the Dog.

Touch.

Interesting problems arise with regard to the seat of tactile and muscular sensibility. Hitzig, whose experiments on *dogs' brains* fifteen years ago opened the entire subject which we are discussing, ascribed the disorders of motility observed after ablations of the motor region to a loss of what he called muscular consciousness. The animals do not notice eccentric positions of their limbs, will stand with their legs crossed, with the affected paw resting on its back or hanging over a table's edge, etc.; and do not resist our bending and stretching of it as they resist with the unaffected paw. Goltz, Munk, Schiff, Herzen, and others promptly ascertained an equal defect of cutaneous sensibility to pain, touch, and cold. The paw is not withdrawn when pinched, remains standing in cold water, etc. Ferrier meanwhile denied that there was any true anæsthesia produced by ablations in the motor zone, and explains the appearance of it as an effect of the sluggish motor responses of the affected side.^[43] Munk^[44] and Schiff^[45], on the contrary, conceive of the 'motor zone' as essentially sensory, and in different ways explain the motor disorders as secondary results of the anæsthesia which is always there, Munk calls the motor zone the *Fühlsphäre* of the animal's limbs, etc., and makes it coordinate with the *Sehsphäre*, the *Hörsphäre*, etc., the entire cortex being, according to him, nothing but a projection-surface for sensations, with no exclusively or essentially motor part. Such a view would be important if true, through its bearings on the psychology of volition. What is the truth? As regards the fact of cutaneous anæsthesia from motor-zone ablations, all other observers are against Ferrier, so that he is probably wrong in denying it. On the other hand, Munk and Schiff are wrong in making the motor symptoms *depend* on the anæsthesia, for in certain rare cases they have been observed to exist not only

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without insensibility, but with actual hyperæsthesia of the parts.^[46] The motor and sensory symptoms seem, therefore, to be independent variables.

In monkeys the latest experiments are those of Horsley and Schaefer,^[47] whose results Ferrier accepts. They find that excision of the hippocampal convolution produces transient insensibility of the opposite side of the body, and that permanent insensibility is produced by destruction of its continuation upwards above the corpus callosum, the so-called *gyrus fornicatus* (the part just below the 'calloso-marginal fissure' in Fig. 7). The insensibility is at its maximum when the entire tract comprising both convolutions is destroyed. Ferrier says that the sensibility of monkeys is 'entirely unaffected' by ablations of the motor zone,^[48] and Horsley and Schaefer consider it by no means necessarily abolished.^[49] Luciani found it diminished in his three experiments on apes.^[50]

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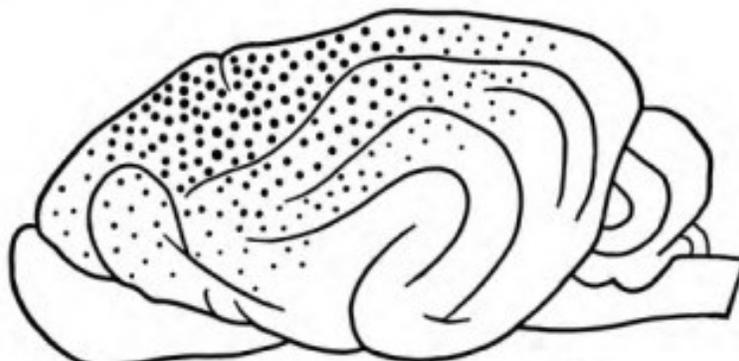


FIG. 20.—Luciani's Tactile Region in the Dog.

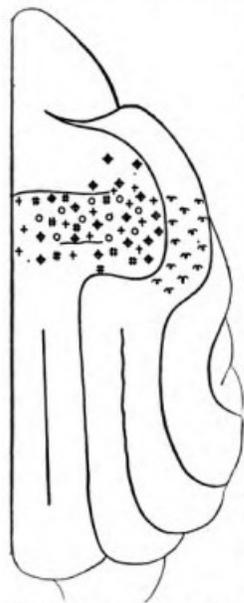
In man we have the fact that one-sided paralysis from disease of the opposite motor zone may or may not be accompanied with anæsthesia of the parts. Luciani, who believes that the motor zone is also sensory, tries to minimize the value of this evidence by pointing to the insufficiency with which patients are examined. He himself believes that in dogs the tactile sphere extends backwards and forwards of the directly excitable region, into the frontal and parietal lobes (see Fig. 20). Nothnagel considers that pathological evidence points in the same direction;^[51] and Dr. Mills, carefully reviewing the evidence, adds the gyri fornicatus and hippocampi to the cutaneo-muscular region in man.^[52] If one compare Luciani's diagrams together (Figs. 14, 16, 19, 20) one will see that the entire parietal region of the dog's skull is common to the four senses of sight, hearing, smell, and touch, including muscular feeling. The corresponding region in the human brain (upper parietal and supra-marginal gyri—see Fig. 17) seems to be a somewhat similar place of conflux. Optical aphasias and motor and tactile disturbances all result from its injury, especially when that is on the left side.^[53] The lower we go in the animal scale the less differentiated the functions of the several brain-parts seem to be.^[54] It may be that the region in question still represents in ourselves something like this primitive condition, and that the surrounding parts, in adapting themselves more and more to specialized and narrow functions, have left it as a sort of *carrefour* through which they send currents and converse. That it should be connected with musculo-cutaneous feeling is, however, no reason why the motor zone proper should not be so connected too. And the cases of paralysis from the motor zone with no accompanying anæsthesia may be explicable without denying all sensory function to that region. For, as my colleague Dr. James Putnam informs me, sensibility is always harder to kill than motility, even where we know for a certainty that the lesion affects tracts that are both sensory and motor. Persons whose hand is paralyzed in its movements from compression of arm-nerves during sleep, still feel with their fingers; and they may still feel in their feet when their legs are paralyzed by bruising of the spinal cord. In a similar way, the motor cortex might be sensitive as well as motor, and yet by this greater subtlety (or whatever the peculiarity may be) in the sensory currents, the sensibility might survive an

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amount of injury there by which the motility was destroyed. Nothnagel considers that there are grounds for supposing the *muscular* sense to be exclusively connected with the parietal lobe and not with the motor zone. "Disease of this lobe gives pure ataxy without palsy, and of the motor zone pure palsy without loss of muscular sense."^[55] He fails, however, to convince more competent critics than the present writer,^[56] so I conclude with them that as yet we have no decisive grounds for locating muscular and cutaneous feeling apart. Much still remains to be learned about the relations between musculo-cutaneous sensibility and the cortex, but one thing is certain: that neither the occipital, the forward frontal, nor the temporal lobes seem to have anything essential to do with it in man. It is knit up with the performances of the *motor zone and of the convolutions backwards and midwards of them*. The reader must remember this conclusion when we come to the chapter on the Will.

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I must add a word about the connection of aphasia with the tactile sense. On [p. 40](#) I spoke of those cases in which the patient can write but not read his own writing. He cannot read by his eyes; but he can read by the feeling in his fingers, if he retrace the letters in the air. It is convenient for such a patient to have a pen in hand whilst reading in this way, in order to make the usual feeling of writing more complete.^[57] In such a case we must suppose that the path between the optical and the graphic centres remains open, whilst that between the optical and the auditory and articulatory centres is closed. Only thus can we understand how the look of the writing should fail to suggest the sound of the words to the patient's mind, whilst it still suggests the proper movements of graphic imitation. These movements in their turn must of course be felt, and the feeling of them must be associated with the centres for hearing and pronouncing the words. The injury in cases like this where very special combinations fail, whilst others go on as usual, must always be supposed to be of the nature of increased resistance to the passage of certain currents of association. If any of the *elements* of mental function were destroyed the incapacity would necessarily be much more formidable. A patient who can both read and write with his fingers most likely uses an identical 'graphic' centre, at once sensory and motor, for both operations.



I have now given, as far as the nature of this book will allow, a complete account of the present state of the localization-question. In its main outlines it stands firm, though much has still to be discovered. The anterior frontal lobes, for example, so far as is yet known, have no definite functions. Goltz finds that dogs bereft of them both are incessantly in motion, and excitable by every small stimulus. They are irascible and amative in an extraordinary degree, and their sides grow bare with perpetual reflex scratching; but they show no *local* troubles of either motion or sensibility. In monkeys not even this lack of inhibitory ability is shown, and neither stimulation nor excision of the prefrontal lobes produces any symptoms whatever. One monkey of Horsley and Schaefer's was as tame, and did certain tricks as well, after as before the operation.^[58] It is probable that we have about reached the limits of what can be learned about brain-functions from vivisection inferior animals, and that we must hereafter look more exclusively to human pathology for light. The existence of separate speech and writing centres in the left hemisphere in man; the fact that palsy from cortical injury is so much more complete and enduring in man and the monkey than in dogs; and the farther fact that it seems

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Dog's motor centres, right hemisphere, according to Paneth.—The points of the motor region are correlated as follows with muscles: the *loops* with the *orbicularis palpebrarum*; the *plain crosses* with the *flexor*, the *crosses inscribed in circles* with the *extensor, digitorum communis* of the fore-paw; the *plain circles* with the *abductor pollicis longus*; the *double crosses* with the *extensor communis* of the hind-limb.

more difficult to get complete sensorial blindness from cortical ablations in the lower animals than in man, all show that functions get more specially localized as evolution goes on. In birds localization seems hardly to exist, and in rodents it is much less conspicuous than in carnivora. Even for man, however, Munk's way of mapping out the cortex into absolute areas within which only one movement or sensation is represented is surely false. The truth seems to be rather that, although there is a correspondence of certain regions of the brain to certain regions of the body, yet the several *parts* within each bodily region are represented throughout the *whole* of the corresponding brain-region like pepper and salt sprinkled from the same caster. This, however, does not prevent each 'part' from having its *focus* at one spot within the brain-region. The various brain-regions merge into each other in the same mixed way. As Mr. Horsley says: "There are border centres, and the area of representation of the face merges into that for the representation of the upper limb. If there was a focal lesion at that point, you would have the movements of these two parts starting together."^[59] The accompanying figure from Paneth shows just how the matter stands in the dog.^[60]

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I am speaking now of localizations breadthwise over the brain-surface. It is conceivable that there might be also localizations depthwise through the cortex. The more superficial cells are smaller, the deepest layer of them is large; and it has been suggested that the superficial cells are sensorial, the deeper ones motor,^[61] or that the superficial ones in the motor region are correlated with the extremities of the organs to be moved (fingers, etc.), the deeper ones with the more central segments (wrist, elbow, etc.).^[62] It need hardly be said that all such theories are as yet but guesses.

We thus see that the postulate of Meynert and Jackson which we started with on [p. 30](#) is on the whole most satisfactorily corroborated by subsequent objective research. *The highest centres do probably contain nothing but arrangements for representing impressions and movements, and other arrangements for coupling the activity Of these arrangements together.*^[63] Currents pouring in from the sense-organs first excite some arrangements, which in turn excite others, until at last a motor discharge downwards of some sort occurs. When this is once clearly grasped there remains little ground for keeping up that old controversy about the motor zone, as to whether it is in reality motor or sensitive. The whole cortex, inasmuch as currents run through it, is both. All the currents probably have feelings going with them, and sooner or later bring movements about. In one aspect, then, every centre is afferent, in another efferent, even the motor cells of the spinal cord having these two aspects inseparably conjoined. Marique,^[64] and Exner and Paneth^[65] have shown that by cutting *round* a 'motor' centre and so separating it from the influence of the rest of the cortex, the same disorders are produced as by cutting it out, so that really it is only the mouth of the funnel, as it were, through which the stream of innervation, starting from elsewhere, pours;^[66] consciousness accompanying the stream, and being mainly of things seen if the stream is strongest occipitally, of things heard if it is strongest temporally, of things felt, etc., if the stream occupies most intensely the 'motor zone.' It seems to me that some broad and vague formulation like this is as much as we can safely venture on in the present state of science; and in subsequent chapters I expect to give confirmatory reasons for my view.

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MAN'S CONSCIOUSNESS LIMITED TO THE HEMISPHERES.

But is the consciousness which accompanies the activity of the cortex the only consciousness that man has? or are his lower centres conscious as well?

This is a difficult question to decide, how difficult one only learns when one discovers that the cortex-consciousness itself of certain objects can be seemingly annihilated in any good hypnotic subject by a bare wave of his operator's hand, and yet be proved by circumstantial evidence to exist all the while in a split-off condition, quite as 'ejective'^[67] to the rest of the subject's mind as that mind is to the mind of the bystanders.^[68] The lower centres themselves may conceivably all the while have a split-off consciousness of their own, similarly ejective to the cortex-consciousness; but whether they have it or not can never be known from merely introspective evidence. Meanwhile the fact that occipital destruction in man may cause a blindness which is apparently absolute (no feeling remaining either of light or dark over one half of the field of view), would lead us to suppose that if our lower optical centres, the corpora quadrigemina, and thalami, do have any consciousness, it is at all events a consciousness which does not mix with that which accompanies the cortical activities, and which has nothing to do with our personal Self. In lower animals this may not be so much the case. The traces of sight found (supra, [p. 46](#)) in dogs and monkeys whose occipital lobes were entirely destroyed, may possibly have been due to the fact that the lower centres of these animals saw, and that what they saw was not ejective but objective to the remaining cortex, i.e. it formed part of one and the same inner world with the things which that cortex perceived. It may be, however, that the phenomena were due to the fact that in these animals the cortical 'centres' for vision reach outside of the occipital zone, and that destruction of the latter fails to remove them as completely as in man. This, as we know, is the opinion of the experimenters themselves. For practical purposes, nevertheless, and limiting the meaning of the word consciousness to the personal self of the individual, we can pretty confidently answer the question prefixed to this paragraph by saying that *the cortex is the sole organ of consciousness in man.*^[69] If there be any consciousness pertaining to the lower centres, it is a consciousness of which the self knows nothing.

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THE RESTITUTION OF FUNCTION.

Another problem, not so metaphysical, remains. The most general and striking fact connected with cortical injury is that of the *restoration of function*. Functions lost at first are after a few days or weeks restored. *How are we to understand this restitution?*

Two theories are in the field:

- 1) Restitution is due to the vicarious action either of the rest of the cortex or of centres lower down, acquiring functions which until then they had not performed;
- 2) It is due to the remaining centres (whether cortical or 'lower') resuming functions which they had always had, but of which the wound had temporarily inhibited the exercise. This is the view of which Goltz and Brown-Séquard are the most distinguished defenders.

Inhibition is a *vera causa*, of that there can be no doubt. The pneumogastric nerve inhibits the heart, the splanchnic inhibits the intestinal movements, and the superior laryngeal those of inspiration. The nerve-irritations which may inhibit the contraction of arterioles are innumerable, and reflex actions are often repressed by the simultaneous excitement of other sensory nerves. For all such facts the reader must consult the treatises on physiology. What concerns us here is the inhibition exerted by different parts of the nerve-centres, when irritated, on the activity of distant parts. The flaccidity of a frog from 'shock,' for a minute or so after his medulla oblongata is cut, is an inhibition from the seat of injury which quickly passes away.

What is known as 'surgical shock' (unconsciousness, pallor, dilatation of splanchnic blood-vessels, and general syncope and collapse) in the human subject is an inhibition which lasts

a longer time. Goltz, Freusberg, and others, cutting the spinal cord in dogs, proved that there were functions inhibited still longer by the wound, but which re-established themselves ultimately if the animal was kept alive. The lumbar region of the cord was thus found to contain independent vaso-motor centres, centres for erection, for control of the sphincters, etc., which could be excited to activity by tactile stimuli and as readily reinhibited by others simultaneously applied.^[70] We may therefore plausibly suppose that the rapid reappearance of motility, vision, etc., after their first disappearance in consequence of a cortical mutilation, is due to the passing off of inhibitions exerted by the irritated surface of the wound. The only question is whether *all* restorations of function must be explained in this one simple way, or whether some part of them may not be owing to the formation of entirely new paths in the remaining centres, by which they become 'educated' to duties which they did not originally possess. In favor of an indefinite extension of the inhibition theory facts may be cited such as the following: In dogs whose disturbances due to cortical lesion have disappeared, they may in consequence of some inner or outer accident reappear in all their intensity for 24 hours or so and then disappear again.^[71] In a dog made half blind by an operation, and then shut up in the dark, vision comes back just as quickly as in other similar dogs whose sight is exercised systematically every day.^[72] A dog which has learned to beg before the operation recommences this practice quite *spontaneously* a week after a double-sided ablation of the motor zone.^[73] Occasionally, in a pigeon (or even, it is said, in a dog) we see the disturbances less marked immediately after the operation than they are half an hour later.^[74] This would be impossible were they due to the subtraction of the organs which normally carried them on. Moreover the entire drift of recent physiological and pathological speculation is towards enthroning inhibition as an ever-present and indispensable condition of orderly activity. We shall see how great is its importance, in the chapter on the Will. Mr. Charles Mercier considers that no muscular contraction, once begun, would ever stop without it, short of exhaustion of the system;^[75] and Brown-Séquard has for years been accumulating examples to show how far its influence extends.^[76] Under these circumstances it seems as if error might more probably lie in curtailing its sphere too much than in stretching it too far as an explanation of the phenomena following cortical lesion.^[77]

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On the other hand, if we admit *no* re-education of centres, we not only fly in the face of an *a priori* probability, but we find ourselves compelled by facts to suppose an almost incredible number of functions natively lodged in the centres below the *thalami* or even in those below the *corpora quadrigemina*. I will consider the *a priori* objection after first taking a look at the facts which I have in mind. They confront us the moment we ask ourselves just *which are the parts which perform the functions abolished by an operation after sufficient time has elapsed for restoration to occur?*

The first observers thought that they must be the *corresponding parts of the opposite or intact hemisphere*. But as long ago as 1875 Carville and Duret tested this by cutting out the fore-leg-centre on one side, in a dog, and then, after waiting till restitution had occurred, cutting it out on the opposite side as well. Goltz and others have done the same thing.^[78] If the opposite side were really the seat of the restored function, the original palsy should have appeared again and been permanent. But it did not appear at all; there appeared only a palsy of the hitherto unaffected side. The next supposition is that *the parts surrounding the cut-out region* learn vicariously to perform its duties. But here, again, experiment seems to upset the hypothesis, so far as the motor zone goes at least; for we may wait till motility has returned in the affected limb, and then both irritate the cortex surrounding the wound without exciting the limb to movement, and ablate it, without bringing back the vanished palsy.^[79] It would accordingly seem that *the cerebral centres below the cortex* must be the seat of the regained activities. But Goltz destroyed a dog's entire left hemisphere, together with the *corpus striatum* and the *thalamus* on that side, and kept him alive until a surprisingly small

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amount of motor and tactile disturbance remained.^[80] These centres cannot here have accounted for the restitution. He has even, as it would appear,^[81] ablated both the hemispheres of a dog, and kept him alive 51 days, able to walk and stand. The corpora striata and thalami in this dog were also practically gone. In view of such results we seem driven, with M. François-Franck,^[82] to fall back on the *ganglia lower still*, or even on the *spinal cord* as the 'vicarious' organ of which we are in quest. If the abeyance of function between the operation and the restoration was due *exclusively* to inhibition, then we must suppose these lowest centres to be in reality extremely accomplished organs. They must always have done what we now find them doing after function is restored, even when the hemispheres were intact. Of course this is conceivably the case; yet it does not seem very plausible. And the *a priori* considerations which a moment since I said I should urge, make it less plausible still.

For, in the first place, the brain is essentially a place of currents, which run in organized paths. Loss of function can only mean one of two things, either that a current can no longer run in, or that if it runs in, it can no longer run out, by its old path. Either of these inabilities may come from a local ablation; and 'restitution' can then only mean that, in spite of a temporary block, an inrunning current has at last become enabled to flow out by its old path again—e.g., the sound of 'give your paw' discharges after some weeks into the same canine muscles into which it used to discharge before the operation. As far as the cortex itself goes, since one of the purposes for which it actually exists is the production of new paths,^[83] the only question before us is: Is the formation of *these particular 'vicarious' paths* too much to expect of its plastic powers? It would certainly be too much to expect that a hemisphere should receive currents from optic fibres whose *arriving-place* within it is destroyed, or that it should discharge into fibres of the pyramidal strand if their *place of exit* is broken down. Such lesions as these must be irreparable *within that hemisphere*. Yet even then, through the other hemisphere, the *corpus callosum*, and the bilateral connections in the spinal cord, one can imagine some road by which the old muscles might eventually be innervated by the same incoming currents which innervated them before the block. And for all minor interruptions, not involving the arriving-place of the 'cortico-petal' or the place of exit of the 'cortico-fugal' fibres, roundabout paths of some sort through the affected hemisphere itself must exist, for every point of it is, remotely at least, in potential communication with every other point. The normal paths are only paths of least resistance. If they get blocked or cut, paths formerly more resistant become the least resistant paths under the changed conditions. It must never be forgotten that a current that runs in has got to run out *somewhere*; and if it only once succeeds by accident in striking into its old place of exit again, the thrill of satisfaction which the consciousness connected with the whole residual brain then receives will reinforce and fix the paths of that moment and make them more likely to be struck into again. The resultant feeling that the old habitual act is at last successfully back again, becomes itself a new stimulus which stamps all the existing currents in. It is matter of experience that such feelings of successful achievement do tend to fix in our memory whatever processes have led to them; and we shall have a good deal more to say upon the subject when we come to the Chapter on the Will.

My conclusion then is this: that some of the restitution of function (especially where the cortical lesion is not too great) is probably due to genuinely vicarious function on the part of the centres that remain; whilst some of it is due to the passing off of inhibitions. In other words, both the vicarious theory and the inhibition theory are true in their measure. But as for determining that measure, or saying which centres are vicarious, and to what extent they can learn new tricks, that is impossible at present.

FINAL CORRECTION OF THE MEYNERT SCHEME.

And now, after learning all these facts, what are we to think of the child and the candle-flame, and of that scheme which provisionally imposed itself on our acceptance after surveying the actions of the frog? (*Cf. pp. 25-6, supra.*) It will be remembered that we then considered the lower centres *en masse* as machines for responding to present sense-impressions exclusively, and the hemispheres as equally exclusive organs of action from inward considerations or ideas; and that, following Meynert, we supposed the hemispheres to have no native tendencies to determinate activity, but to be merely superadded organs for breaking up the various reflexes performed by the lower centres, and combining their motor and sensory elements in novel ways. It will also be remembered that I prophesied that we should be obliged to soften down the sharpness of this distinction after we had completed our survey of the farther facts. The time has now come for that correction to be made.

Wider and completer observations show us both that the lower centres are more spontaneous, and that the hemispheres are more automatic, than the Meynert scheme allows. Schrader's observations in Goltz's Laboratory on hemisphereless frogs^[84] and pigeons^[85] give an idea quite different from the picture of these creatures which is classically current. Steiner's^[86] observations on frogs already went a good way in the same direction, showing, for example, that locomotion is a well-developed function of the medulla oblongata. But Schrader, by great care in the operation, and by keeping the frogs a long time alive, found that at least in some of them the spinal cord would produce movements of locomotion when the frog was smartly roused by a poke, and that swimming and croaking could sometimes be performed when nothing above the medulla oblongata remained.^[87] Schrader's hemisphereless frogs moved spontaneously, ate flies, buried themselves in the ground, and in short did many things which before his observations were supposed to be impossible unless the hemispheres remained. Steiner^[88] and Vulpian have remarked an even greater vivacity in fishes deprived of their hemispheres. Vulpian says of his brainless carps^[89] that three days after the operation one of them darted at food and at a knot tied on the end of a string, holding the latter so tight between his jaws that his head was drawn out of water. Later, "they see morsels of white of egg; the moment these sink through the water in front of them, they follow and seize them, sometimes after they are on the bottom, sometimes before they have reached it. In capturing and swallowing this food they execute just the same movements as the intact carps which are in the same aquarium. The only difference is that they seem to see them at less distance, seek them with less impetuosity and less perseverance in all the points of the bottom of the aquarium, but they struggle (so to speak) sometimes with the sound carps to grasp the morsels. It is certain that they do not confound these bits of white of egg with other white bodies, small pebbles for example, which are at the bottom of the water. The same carp which, three days after operation, seized the knot on a piece of string, no longer snaps at it now, but if one brings it near her, she draws away from it by swimming backwards before it comes into contact with her mouth."^[90] Already on [pp. 9-10](#), as the reader may remember, we instanced those adaptations of conduct to new conditions, on the part of the frog's spinal cord and thalami, which led Pflüger and Lewes on the one hand and Goltz on the other to locate in these organs an intelligence akin to that of which the hemispheres are the seat.

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When it comes to birds deprived of their hemispheres, the evidence that some of their acts have conscious purpose behind them is quite as persuasive. In pigeons Schrader found that the state of somnolence lasted only three or four days, after which time the birds began indefatigably to walk about the room. They climbed out of boxes in which they were put, jumped over or flew up upon obstacles, and their sight was so perfect that neither in walking nor flying did they ever strike any object in the room. They had also definite ends or purposes, flying straight for more convenient perching places when made uncomfortable by movements imparted to those on which they stood; and of several possible perches they always chose the most convenient. "If we give the dove the choice of a horizontal bar (*Reck*) or an equally distant table to fly to, she always gives decided preference to the table. Indeed

she chooses the table even if it is several meters farther off than the bar or the chair." Placed on the back of a chair, she flies first to the seat and then to the floor, and in general "will forsake a high position, although it give her sufficiently firm support, and in order to reach the ground will make use of the environing objects as intermediate goals of flight, showing a perfectly correct judgment of their distance. Although able to fly directly to the ground, she prefers to make the journey in successive stages.... Once on the ground, she hardly ever rises spontaneously into the air."^[91]

Young rabbits deprived of their hemispheres will stand, run, start at noises, avoid obstacles in their path, and give responsive cries of suffering when hurt. Rats will do the same, and throw themselves moreover into an attitude of defence. Dogs never survive such an operation if performed at once. But Goltz's latest dog, mentioned on [p. 70](#), which is said to have been kept alive for fifty-one days after both hemispheres had been removed by a series of ablations and the corpora striata and thalami had softened away, shows how much the mid-brain centres and the cord can do even in the canine species. Taken together, the number of reactions shown to exist in the lower centres by these observations make out a pretty good case for the Meynert scheme, as applied to these lower animals. That scheme demands hemispheres which shall be mere supplements or organs of repetition, and in the light of these observations they obviously are so to a great extent. But the Meynert scheme also demands that the reactions of the lower centres shall all be *native*, and we are not absolutely sure that some of those which we have been considering may not have been acquired after the injury; and it furthermore demands that they should be machine-like, whereas the expression of some of them makes us doubt whether they may not be guided by an intelligence of low degree.

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Even in the lower animals, then, there is reason to soften down that opposition between the hemispheres and the lower centres which the scheme demands. The hemispheres may, it is true, only supplement the lower centres, but the latter resemble the former in nature and have some small amount at least of 'spontaneity' and choice.

But when we come to monkeys and man the scheme well-nigh breaks down altogether; for we find that the hemispheres do not simply repeat voluntarily actions which the lower centres perform as machines. There are many functions which the lower centres cannot by themselves perform at all. When the motor cortex is injured in a man or a monkey genuine paralysis ensues, which in man is incurable, and almost or quite equally so in the ape. Dr. Seguin knew a man with hemi-blindness, from cortical injury, which had persisted unaltered for twenty-three years. 'Traumatic inhibition' cannot possibly account for this. The blindness must have been an 'Ausfallserscheinung,' due to the loss of vision's essential organ. It would seem, then, that in these higher creatures the lower centres must be less adequate than they are farther down in the zoological scale; and that even for certain elementary combinations of movement and impression the co-operation of the hemispheres is necessary from the start. Even in birds and dogs the power of *eating properly* is lost when the frontal lobes are cut off.^[92]

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The plain truth is that neither in man nor beast are the hemispheres the virgin organs which our scheme called them. So far from being unorganized at birth, they must have native tendencies to reaction of a determinate sort.^[93] These are the tendencies which we know as *emotions* and *instincts*, and which we must study with some detail in later chapters of this book. Both instincts and emotions are reactions upon special sorts of objects of *perception*; they depend on the hemispheres; and they are in the first instance reflex, that is, they take place the first time the exciting object is met, are accompanied by no forethought or deliberation, and are irresistible. But they are modifiable to a certain extent by experience, and on later occasions of meeting the exciting object, the instincts especially have less of the blind impulsive character which they had at first. All this will be explained at some length in Chapter XXIV. Meanwhile we can say that the multiplicity of emotional and instinctive reactions in man, together with his extensive associative power, permit of extensive

recouplings of the original sensory and motor partners. The *consequences* of one instinctive reaction often prove to be the inciters of an opposite reaction, and being *suggested* on later occasions by the original object, may then suppress the first reaction altogether, just as in the case of the child and the flame. For this education the hemispheres do not need to be *tabulae rasae* at first, as the Meynert scheme would have them; and so far from their being educated by the lower centres exclusively, they educate themselves.^[94]

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We have already noticed the absence of reactions from fear and hunger in the ordinary brainless frog. Schrader gives a striking account of the instinctless condition of his brainless pigeons, active as they were in the way of locomotion and voice. "The hemisphereless animal moves in a world of bodies which ... are all of equal value for him.... He is, to use Goltz's apt expression, *impersonal*.... Every object is for him only a space-occupying mass, he turns out of his path for an ordinary pigeon no otherwise than for a stone. He may try to climb over both. All authors agree that they never found any difference, whether it was an inanimate body, a cat, a dog, or a bird of prey which came in their pigeon's way. The creature knows neither friends nor enemies, in the thickest company it lives like a hermit. The languishing cooing of the male awakens no more impression than the rattling of the peas, or the call-whistle which in the days before the injury used to make the birds hasten to be fed. Quite as little as the earlier observers have I seen hemisphereless she-birds answer the courting of the male. A hemisphereless male will coo all day long and show distinct signs of sexual excitement, but his activity is without any object, it is entirely indifferent to him whether the she-bird be there or not. If one is placed near him, he leaves her unnoticed.... As the male pays no attention to the female, so she pays none to her young. The brood may follow the mother ceaselessly calling for food, but they might as well ask it from a stone.... The hemisphereless sphereless pigeon is in the highest degree tame, and fears man as little as cat or bird of prey."^[95]

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Putting together now all the facts and reflections which we have been through, it seems to me that *we can no longer hold strictly to the Meynert scheme*. If anywhere, it will apply to the lowest animals; but in them especially the lower centres seem to have a degree of spontaneity and choice. On the whole, I think that we are driven to substitute for it some such general conception as the following, which allows for zoological differences as we know them, and is vague and elastic enough to receive any number of future discoveries of detail.

CONCLUSION.

All the centres, in all animals, whilst they are in one aspect mechanisms, probably are, or at least once were, organs of consciousness in another, although the consciousness is doubtless much more developed in the hemispheres than it is anywhere else. The consciousness must everywhere *prefer* some of the sensations which it gets to others; and if it can remember these in their absence, however dimly, they must be its *ends* of desire. If, moreover, it can identify in memory any motor discharges which may have led to such ends, and associate the latter with them, then these motor discharges themselves may in turn become desired as *means*. This is the development of *will*; and its realization must of course be proportional to the possible complication of the consciousness. Even the spinal cord may possibly have some little power of will in this sense, and of effort towards modified behavior in consequence of new experiences of sensibility.^[96]

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All nervous centres have then in the first instance one essential function, that of 'intelligent' action. They feel, prefer one thing to another, and have 'ends.' Like all other organs, however, they *evolve* from ancestor to descendant, and their evolution takes two directions, the lower centres passing downwards into more unhesitating automatism, and the higher ones upwards into larger intellectuality.^[97] Thus it may happen that those functions which

can safely grow uniform and fatal become least accompanied by mind, and that their organ, the spinal cord, becomes a more and more soulless machine; whilst on the contrary those functions which it benefits the animal to have adapted to delicate environing variations pass more and more to the hemispheres, whose anatomical structure and attendant consciousness grow more and more elaborate as zoological evolution proceeds. In this way it might come about that in man and the monkeys the basal ganglia should do fewer things by themselves than they can do in dogs, fewer in dogs than in rabbits, fewer in rabbits than in hawks,^[98] fewer in hawks than in pigeons, fewer in pigeons than in frogs, fewer in frogs than in fishes, and that the hemispheres should correspondingly do more. This passage of functions forward to the ever-enlarging hemispheres would be itself one of the evolutive changes, to be explained like the development of the hemispheres themselves, either by fortunate variation or by inherited effects of use. The reflexes, on this view, upon which the education of our human hemispheres depends, would not be due to the basal ganglia alone. They would be tendencies in the hemispheres themselves, modifiable by education, unlike the reflexes of the medulla oblongata, pons, optic lobes and spinal cord. Such cerebral reflexes, if they exist, form a basis quite as good as that which the Meynert scheme offers, for the acquisition of memories and associations which may later result in all sorts of 'changes of partners' in the psychic world. The diagram of the baby and the candle (see [page 25](#)) can be re-edited, if need be, as an entirely cortical transaction. The original tendency to touch will be a cortical instinct; the burn will leave an image in another part of the cortex, which, being recalled by association, will inhibit the touching tendency the next time the candle is perceived, and excite the tendency to withdraw—so that the retinal picture will, upon that next time, be coupled with the original motor partner of the pain. We thus get whatever psychological truth the Meynert scheme possesses without entangling ourselves on a dubious anatomy and physiology.

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Some such shadowy view of the evolution of the centres, of the relation of consciousness to them, and of the hemispheres to the other lobes, is, it seems to me, that in which it is safest to indulge. If it has no other advantage, it at any rate makes us realize how enormous are the gaps in our knowledge, the moment we try to cover the facts by any one formula of a general kind.

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- [4] It should be said that this particular cut commonly proves fatal. The text refers to the rare cases which survive.
- [5] I confine myself to the frog for simplicity's sake. In higher animals, especially the ape and man, it would seem as if not only determinate combinations of muscles, but limited groups or even single muscles could be innervated from the hemispheres.
- [6] I hope that the reader will take no umbrage at my so mixing the physical and mental, and talking of reflex acts and hemispheres and reminiscences in the same breath, as if they were homogeneous quantities and factors of one causal chain. I have done so deliberately; for although I admit that from the radically physical point of view it is easy to conceive of the chain of events amongst the cells and fibres as complete in itself, and that whilst so conceiving it one need make no mention of 'ideas,' I yet suspect that point of view of being an unreal abstraction. Reflexes in centres may take place even where accompanying feelings or ideas guide them. In another chapter I shall try to show reasons for not abandoning this common-sense position; meanwhile language lends itself so much more easily to the mixed way of describing, that I will continue to employ the latter. The more radical-minded reader can always read 'ideational process' for 'idea.'
- [7] I shall call it hereafter for shortness 'the Meynert scheme;' for the child-and-flame example, as well as the whole general notion that the hemispheres are a

supernumerary surface for the projection and association of sensations and movements natively coupled in the centres below, is due to Th. Meynert, the Austrian anatomist. For a popular account of his views, see his pamphlet 'Zur Mechanik des Gehirnsbaues,' Vienna, 1874. His most recent development of them is embodied in his 'Psychiatry,' a clinical treatise on diseases of the forebrain, translated by B. Sachs, New York, 1885.

- [8] Geschichte des Materialismus, 2d ed., ii, p. 345.
- [9] West Riding Asylum Reports, 1876, p. 267.
- [10] For a thorough discussion of the various objections, see Ferrier's 'Functions of the Brain,' 2d ed., pp. 227-234, and François-Franck's 'Leçons sur les Fonctions Motrices du Cerveau' (1887), Leçon 31. The most minutely accurate experiments on irritation of cortical points are those of Paneth, in Pflüger's Archiv, vol 37, p. 528.—Recently the skull has been fearlessly opened by surgeons, and operations upon the human brain performed, sometimes with the happiest results. In some of these operations the cortex has been electrically excited for the purpose of more exactly localizing the spot, and the movements first observed in dogs and monkeys have then been verified in men.
- [11] J. Loeb: Beiträge zur Physiologie des Grosshirns; Pflüger's Archiv, xxxix, 293. I simplify the author's statement.
- [12] Goltz: Pflüger's Archiv, xlii, 419.
- [13] 'Hemiplegia' means one-sided palsy.
- [14] Philosophical Transactions, vol. 179, pp. 6, 10 (1888). In a later paper (*ibid.* p. 205) Messrs. Beevor and Horsley go into the localization still more minutely, showing spots from which single muscles or single digits can be made to contract.
- [15] Nothnagel und Naunyn; Die Localization in den Gehirnkrankheiten (Wiesbaden, 1887), p. 34.
- [16] An accessible account of the history of our knowledge of motor aphasia is in W. A. Hammond's 'Treatise on the Diseases of the Nervous System,' chapter vii.
- [17] The history up to 1885 may be found in A. Christiani: Zur Physiologie des Gehirnes (Berlin, 1885).
- [18] Pflüger's Archiv, vol. 44, p. 176. Munk (Berlin Academy Sitzungberichte, 1889, xxxi) returns to the charge, denying the extirpations of Schrader to be complete: "Microscopic portions of the *Sehsphäre* must remain."
- [19] A. Christiani; Zur Physiol. d. Gehirnes (Berlin, 1885), chaps. ii, iii, iv, H. Munk: Berlin Akad. Stzgsb. 1884, xxiv.
- [20] Luciani und Seppili: Die Functions-Localization auf der Grosshirnrinde (Deutsch von Fraenkel), Leipzig, 1886, Dogs M, N, and S. Goltz in Pflüger's Archiv, vol. 34, pp. 490-6; vol. 42, p. 454. Cf. also Munk: Berlin Akad. Stzgsb. 1886, vii, viii, pp. 113-121, and Loeb: Pflüger's Archiv, vol. 39, p. 337.
- [21] Berlin Akad. Sitzungsberichte, 1886, vii, viii, p. 124.
- [22] H. Munk: Functionen der Grosshirnrinde (Berlin, 1881), pp. 36-40. Ferrier: Functions, etc., 2d ed., chap. ix, pt. i. Brown and Schaefer, Philos. Transactions, vol. 179, p. 321. Luciani u. Seppili, op. cit. pp. 131-138. Lannegrace found traces of sight with both occipital lobes destroyed, and in one monkey even when angular gyri and occipital lobes were destroyed altogether. His paper is in the Archives de Médecine Expérimentale for January and March, 1889. I only know it from the abstract in the Neurologisches Centralblatt, 1889, pp. 108-420. The reporter doubts the evidence of vision in the monkey. It appears to have consisted in avoiding obstacles and in emotional disturbance in the presence of men.
- [23] Localization of Cerebral Disease (1878), pp. 117-8.

- [24] For cases see Flechsig: *Die Leitungsbahnen in Gehirn u. Rückenmark* (Leipzig, 1876), pp. 112, 272; Exner's *Untersuchungen, etc.*, p. 83; Ferrier's *Localization, etc.*, p. 11; François-Franck's *Cerveau Moteur*, p. 63, note.
- [25] E. C. Seguin: *Hemianopsia of Cerebral Origin*, in *Journal of Nervous and Mental Disease*, vol. xiii, p. 30. Nothnagel und Naunyn: *Ueber die Localization der Gehirnkrankheiten* (Wiesbaden, 1887), p. 16.
- [26] *Die Seelenblindheit, etc.*, p. 51 ff. The mental blindness was in this woman's case moderate in degree.
- [27] *Archiv f. Psychiatrie*, vol. 21, p. 222.
- [28] Nothnagel (*loc. cit.* p. 22) says: "*Dies trifft aber nicht zu.*" He gives, however, no case in support of his opinion that double-sided cortical lesion may make one stone-blind and yet not destroy one's visual images; so that I do not know whether it is an observation of fact or an *a priori* assumption.
- [29] In a case published by C. S. Freund: *Archiv f. Psychiatrie*, vol. xx, the occipital lobes were injured, but their cortex was not destroyed, on both sides. There was still vision. Cf. [pp. 291-5](#).
- [30] I say 'need,' for I do not of course deny the *possible* coexistence of the two symptoms. Many a brain-lesion might block optical associations and at the same time impair optical imagination, without entirely stopping vision. Such a case seems to have been the remarkable one from Charcot which I shall give rather fully in the chapter on Imagination.
- [31] Freund (in the article cited above 'Ueber optische Aphasie und Seelenblindheit') and Bruns ('Ein Fall von Alexie,' etc., in the *Neurologisches Centralblatt* for 1888, pp. 581, 509) explain their cases by broken-down conduction. Wilbrand, whose painstaking monograph on mental blindness was referred to a moment ago, gives none but *a priori* reasons for his belief that the optical 'Erinnerungsfeld' must be locally distinct from the *Wahrnehmungsfeld* (cf. [pp. 84, 93](#)). The *a priori* reasons are really the other way. Mauthner ('Gehirn u. Auge' (1881), p. 487 ff.) tries to show that the 'mental blindness' of Munk's dogs and apes after occipital mutilation was not such, but real dimness of sight. The best case of mental blindness yet reported is that by Lissauer, as above. The reader will also do well to read Bernard: *De l'Aphasie* (1885) chap. v; Ballet: *Le Langage Intérieur* (1886), chap. viii; and Jas. Boss's little book on *Aphasia* (1887), p. 74.
- [32] For a case see Wernicke's *Lehrb. d. Gehirnkrankheiten*, vol. ii, p. 554 (1881).
- [33] The latest account of them is the paper 'Über die optischen Centren u. Bahnen' by von Monakow in the *Archiv für Psychiatrie*, vol. xx, p. 714.
- [34] *Die Functions-Localization, etc.*, Dog X; see also p. 161.
- [35] *Philos. Trans.*, vol. 179, p. 312.
- [36] *Brain*, vol. xi, p. 10.
- [37] *Ibid.* p. 147.
- [38] *Der aphasische Symptomencomplex* (1874). See in Fig. 11 the convolution marked WERNICKE.
- [39] 'The Pathology of Sensory Aphasia,' *Brain*, July, 1889.
- [40] Nothnagel und Naunyn; *op. cit.* plates.
- [41] Ballet's and Bernard's works cited on [p. 51](#) are the most accessible documents of Charcot's school. Bastian's book on the *Brain as an Organ of Mind* (last three chapters) is also good.
- [42] For details, see Ferrier's 'Functions,' chap. ix, pt. iii, and Chas. K. Mills: *Transactions of Congress of American Physicians and Surgeons*, 1888, vol. i, p.

278.

- [43] Functions of the Brain, chap. x, § 14.
- [44] Ueber die Functionen d. Grosshirnrinde (1881), p. 50.
- [45] Lezioni di Fisiologia sperimentale sul sistema nervoso encefalico (l. 73), p. 527 ff. Also 'Brain,' vol. ix, p. 298.
- [46] Bechterew (Pflüger's Archiv, vol. 35, p. 137) found *no* anæsthesia in a cat with motor symptoms from ablation of sigmoid gyrus. Luciani got hyperæsthesia coexistent with cortical motor defect in a dog, by simultaneously hemisecting the spinal cord (Luciani u. Seppili, *op. cit.* p. 234). Goltz frequently found hyperæsthesia of the whole body to accompany motor defect after ablation of both frontal lobes, and he once found it after ablating the motor zone (Pflüger's Archiv, vol. 34, p. 471).
- [47] Philos. Transactions, vol. 179, p. 20 ff.
- [48] Functions, p. 375.
- [49] Pp. 15-17.
- [50] Luciani u. Seppili, *op. cit.* pp. 275-288.
- [51] *Op. cit.* p. 18.
- [52] Trans. of Congress, etc., p. 272.
- [53] See Exner's Unters. üb. Localization, plate xxv.
- [54] Cf. Ferrier's Functions, etc., chap. iv, and chap. x, §§ 6 to 9.
- [55] *Op. cit.* p. 17.
- [56] E.g. Starr, *loc. cit.* p. 272; Leyden, Beiträge zur Lehre v. d. Localization im Gehirn (1888), p. 72.
- [57] Bernard, *op. cit.* p. 84.
- [58] Philos. Trans., vol. 179, p. 3.
- [59] Trans. of Congress of Am. Phys. and Surg. 1888, vol. i, p. 343. Beevor and Horsley's paper on electric stimulation of the monkey's brain is the most beautiful work yet done for precision. See Phil. Trans., vol. 179, p. 205, especially the plates.
- [60] Pflüger's Archiv, vol. 37, p. 523 (1885).
- [61] By Luys in his generally preposterous book 'The Brain'; also by Horsley.
- [62] C. Mercier: The Nervous System and the Mind, p. 124.
- [63] The frontal lobes as yet remain a puzzle. Wundt tries to explain them as an organ of 'apperception' (Grundzüge d. Physiologischen Psychologie, 3d ed., vol. i, p. 233 ff.), but I confess myself unable to apprehend clearly the Wundtian philosophy so far as this word enters into it, so must be contented with this bare reference.—Until quite recently it was common to talk of an 'ideational centre' as of something distinct from the aggregate of other centres. Fortunately this custom is already on the wane.
- [64] Rech. Exp. sur le Fonctionnement des Centres Psycho-moteurs (Brussels, 1885).
- [65] Pflüger's Archiv, vol. 44, p. 544.
- [66] I ought to add, however, that François-Franck (Fonctions Motrices, p. 370) got, in two dogs and a cat, a different result from this sort of 'circumvallation.'
- [67] For this word, see T. K. Clifford's Lectures and Essays (1879), vol. ii, p. 72.
- [68] See below, [Chapter VIII](#).

- [69] Cf. Ferrier's Functions, pp. 120, 147, 414. See also Vulpian: *Leçons sur la Physiol. du Syst. Nerveux*, p. 548; Luciani u. Seppili, *op. cit.* pp. 404-5; H. Maudsley: *Physiology of Mind* (1876), pp. 138 ff., 197 ff., and 241 ff. In G. H. Lewes's *Physical Basis of Mind*, Problem IV: 'The Reflex Theory,' a very full history of the question is given.
- [70] Goltz: Pflüger's Archiv, vol. 8, p. 460; Freusberg: *ibid.* vol. 10, p. 174.
- [71] Goltz: *Verrichtungen des Grosshirns*, p. 78.
- [72] Loeb: Pflüger's Archiv, vol. 89, p. 276.
- [73] *Ibid.* p. 289.
- [74] Schrader: *ibid.* vol. 44, p. 218.
- [75] *The Nervous System and the Mind* (1888), chaps. iii, vi; also in *Brain*, vol. xi, p. 361.
- [76] Brown-Séguard has given a resume of his opinions in the *Archives de Physiologie* for Oct. 1889, 5me. Série, vol. i, p. 751.
- [77] Goltz first applied the inhibition theory to the brain in his '*Verrichtungen des Grosshirns*,' p. 39 ff. On the general philosophy of Inhibition the reader may consult Brunton's '*Pharmakology and Therapeutics*,' p. 154 ff., and also '*Nature*,' vol. 27, p. 419 ff.
- [78] E.g. Herzen, Herman u. Schwalbe's *Jahres-bericht* for 1886, *Physiol. Abth.* p. 38. (Experiments on new-born puppies.)
- [79] François-Franck: *op. cit.* p. 382. Results are somewhat contradictory.
- [80] Pflüger's Archiv, vol. 42, p. 419.
- [81] *Neurologisches Centralblatt*, 1889, p. 372.
- [82] *Op. cit.* p. 387. See pp. 378 to 388 for a discussion of the whole question. Compare also Wundt's *Physiol. Psych.*, 3d ed., i, 225 ff., and Luciani u. Seppili, pp. 243, 293.
- [83] The Chapters on Habit, Association, Memory, and Perception will change our present preliminary conjecture that that is one of its essential uses, into an unshakable conviction.
- [84] Pflüger's Archiv, vol. 41, p. 75 (1887).
- [85] *Ibid.* vol. 44, p. 175 (1889).
- [86] *Untersuchungen über die Physiologie des Froschhirns*. 1885.
- [87] *Loc. cit.* pp. 80, 82-3. Schrader also found a *biting-reflex* developed when the medulla oblongata is cut through just behind the cerebellum.
- [88] *Berlin Akad. Sitzungsberichte* for 1886.
- [89] *Comptes Rendus*, vol. 102, p. 90.
- [90] *Comptes Rendus de l'Acad. d. Sciences*, vol. 102, p. 1530.
- [91] *Loc. cit.* p. 210.
- [92] Goltz: Pflüger's Archiv, vol. 42, p. 447; Schrader: *ibid.* vol. 44, p. 219 ff. It is possible that this symptom may be an effect of traumatic inhibition, however.
- [93] A few years ago one of the strongest arguments for the theory that the hemispheres are purely supernumerary was Soltmann's often-quoted observation that in new-born puppies the motor zone of the cortex is not excitable by electricity and only becomes so in the course of a fortnight, presumably after the experiences of the lower centres have educated it to motor duties. Paneth's later observations, however, seem to show that Soltmann may have been misled through overnarcotizing his victims (Pflüger's Archiv, vol. 37, p. 202). In the

Neurologisches Centralblatt for 1889, p. 513, Bechterew returns to the subject on Soltmann's side without, however, noticing Paneth's work.

- [94] Münsterberg (Die Willenshandlung, 1888, p. 134) challenges Meynert's scheme *in toto*, saying that whilst we have in our personal experience plenty of examples of acts which were at first voluntary becoming secondarily automatic and reflex, we have no conscious record of a single originally reflex act growing voluntary.—As far as conscious record is concerned, we could not possibly have it even if the Meynert scheme were wholly true, for the education of the hemispheres which that scheme postulates must in the nature of things antedate recollection. But it seems to me that Münsterberg's rejection of the scheme may possibly be correct as regards reflexes from the *lower centres*. Everywhere in this department of psychogenesis we are made to feel how ignorant we really are.
- [95] Pflüger's Archiv, vol. 44, p. 230-1.
- [96] Naturally, as Schiff long ago pointed out (Lehrb. d. Muskel-u. Nervenphysiologie, 1859, p. 213 ff.), the 'Rückenmarksseele,' if it now exist, can have no higher sense-consciousness, for its incoming currents are solely from the skin. But it may, in its dim way, both feel, prefer, and desire. See, for the view favorable to the text: G. H. Lewes, The Physiology of Common Life (1860), chap. ix. Goltz (Nervencentren des Frosches 1869, pp. 102-130) thinks that the frog's cord has no adaptative power. This may be the case in such experiments as his, because the beheaded frog's short span of life does not give it time to learn the new tricks asked for. But Rosenthal (Biologisches Centralblatt, vol. iv, p. 247) and Mendelssohn (Berlin Akad. Sitzungsberichte, 1885, p. 107) in their investigations on the simple reflexes of the frog's cord, show that there is some adaptation to new conditions, inasmuch as when usual paths of conduction are interrupted by a cut, new paths are taken. According to Rosenthal, these grow more pervious (i.e. require a smaller stimulus) in proportion as they are more often traversed.
- [97] Whether this evolution takes place through the inheritance of habits acquired, or through the preservation of lucky variations, is an alternative which we need not discuss here. We shall consider it in the last chapter in the book. For our present purpose the *modus operandi* of the evolution makes no difference, provided it be admitted to occur.
- [98] See Schrader's Observations, *loc. cit.*

CHAPTER III.

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ON SOME GENERAL CONDITIONS OF BRAIN-ACTIVITY.

The elementary properties of nerve-tissue on which the brain-functions depend are far from being satisfactorily made out. The scheme that suggests itself in the first instance to the mind, because it is so obvious, is certainly false: I mean the notion that each cell stands for an idea or part of an idea, and that the ideas are associated or 'bound into bundles' (to use a phrase of Locke's) by the fibres. If we make a symbolic diagram on a blackboard, of the laws of association between ideas, we are inevitably led to draw circles, or closed figures of some kind, and to connect them by lines. When we hear that the nerve-centres contain cells which send off fibres, we say that Nature has realized our diagram for us, and that the mechanical substratum of thought is plain. In *some* way, it is true, our diagram must be realized in the brain; but surely in no such visible and palpable way as we at first suppose.

[99] An enormous number of the cellular bodies in the hemispheres are fibreless. Where fibres are sent off they soon divide into untraceable ramifications; and nowhere do we see a simple coarse anatomical connection, like a line on the blackboard, between two cells. Too

much anatomy has been found to order for theoretic purposes, even by the anatomists; and the popular-science notions of cells and fibres are almost wholly wide of the truth. Let us therefore relegate the subject of the *intimate* workings of the brain to the physiology of the future, save in respect to a few points of which a word must now be said. And first of

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THE SUMMATION OF STIMULI

in the same nerve-tract. This is a property extremely important for the understanding of a great many phenomena of the neural, and consequently of the mental, life; and it behooves us to gain a clear conception of what it means before we proceed any farther.

The law is this, that *a stimulus which would be inadequate by itself to excite a nerve-centre to effective discharge may, by acting with one or more other stimuli (equally ineffectual by themselves alone) bring the discharge about.* The natural way to consider this is as a summation of tensions which at last overcome a resistance. The first of them produce a 'latent excitement' or a 'heightened irritability'—the phrase is immaterial so far as practical consequences go; the last is the straw which breaks the camel's back. Where the neural process is one that has consciousness for its accompaniment, the final explosion would in all cases seem to involve a vivid state of feeling of a more or less substantive kind. But there is no ground for supposing that the tensions whilst yet submaximal or outwardly ineffective, may not also have a share in determining the total consciousness present in the individual at the time. In later chapters we shall see abundant reason to suppose that they do have such a share, and that without their contribution the fringe of relations which is at every moment a vital ingredient of the mind's object, would not come to consciousness at all.

The subject belongs too much to physiology for the evidence to be cited in detail in these pages. I will throw into a note a few references for such readers as may be interested in following it out,^[100] and simply say that the direct electrical irritation of the cortical centres sufficiently proves the point. For it was found by the earliest experimenters here that whereas it takes an exceedingly strong current to produce any movement when a single induction-shock is used, a rapid succession of induction-shocks ('faradization') will produce movements when the current is comparatively weak. A single quotation from an excellent investigation will exhibit this law under further aspects:

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"If we continue to stimulate the cortex at short intervals with the strength of current which produces the minimal muscular contraction [of the dog's digital extensor muscle], the amount of contraction gradually increases till it reaches the maximum. Each earlier stimulation leaves thus an effect behind it, which increases the efficacy of the following one. In this summation of the stimuli.... the following points may be noted: 1) Single stimuli entirely inefficacious when alone may become efficacious by sufficiently rapid reiteration. If the current used is very much less than that which provokes the first beginning of contraction, a very large number of successive shocks may be needed before the movement appears—20, 50, once 106 shocks were needed. 2) The summation takes place easily in proportion to the shortness of the interval between the stimuli. A current too weak to give effective summation when its shocks are 3 seconds apart will be capable of so doing when the interval is shortened to 1 second. 3) Not only electrical irritation leaves a modification which goes to swell the following stimulus, but every sort of irritant which can produce a contraction does so. If in any way a reflex contraction of the muscle experimented on has been produced, or if it is contracted spontaneously by the animal (as not unfrequently happens 'by sympathy,' during a deep inspiration), it is found that an electrical stimulus, until then inoperative, operates energetically if immediately applied."^[101]

Furthermore:

"In a certain stage of the morphia-narcosis an ineffectively weak shock will become powerfully effective, if, immediately before its application to the motor centre, the skin of certain parts of the body is exposed to gentle tactile stimulation.... If, having ascertained the subminimal strength of current and convinced one's self repeatedly of its inefficacy, we draw our hand a single time lightly over the skin of the paw whose cortical centre is the object of stimulation, we find the current at once strongly effective. The increase of irritability lasts some seconds before it disappears. Sometimes the effect of a single light stroking of the paw is only sufficient to make the previously ineffectual current produce a very weak contraction. Repeating the tactile stimulation will then, as a rule, increase the contraction's extent."^[102]

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We constantly use the summation of stimuli in our practical appeals. If a car-horse balks, the final way of starting him is by applying a number of customary incitements at once. If the driver uses reins and voice, if one bystander pulls at his head, another lashes his hind quarters, and the conductor rings the bell, and the dismounted passengers shove the car, all at the same moment, his obstinacy generally yields, and he goes on his way rejoicing. If we are striving to remember a lost name or fact, we think of as many 'cues' as possible, so that by their joint action they may recall what no one of them can recall alone. The sight of a dead prey will often not stimulate a beast to pursuit, but if the sight of movement be added to that of form, pursuit occurs. "Brücke noted that his brainless hen, which made no attempt to peck at the grain under her very eyes, began pecking if the grain were thrown on the ground with force, so as to produce a rattling sound."^[103] "Dr. Allen Thomson hatched out some chickens on a carpet, where he kept them for several days. They showed no inclination to scrape,... but when Dr. Thomson sprinkled a little gravel on the carpet,... the chickens immediately began their scraping movements."^[104] A strange person, and darkness, are both of them stimuli to fear and mistrust in dogs (and for the matter of that, in men). Neither circumstance alone may awaken outward manifestations, but together, i.e. when the strange man is met in the dark, the dog will be excited to violent defiance.^[105] Street-hawkers well know the efficacy of summation, for they arrange themselves in a line upon the sidewalk, and the passer often buys from the last one of them, through the effect of the reiterated solicitation, what he refused to buy from the first in the row. Aphasia shows many examples of summation. A patient who cannot name an object simply shown him, will name it if he touches as well as sees it, etc.

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Instances of summation might be multiplied indefinitely, but it is hardly worth while to forestall subsequent chapters. Those on Instinct, the Stream of Thought, Attention, Discrimination, Association, Memory, Æsthetics, and Will, will contain numerous exemplifications of the reach of the principle in the purely psychological field.

REACTION-TIME.

One of the lines of experimental investigation most diligently followed of late years is that of the ascertainment of the *time occupied by nervous events*. Helmholtz led off by discovering the rapidity of the current in the sciatic nerve of the frog. But the methods he used were soon applied to the sensory nerves and the centres, and the results caused much popular scientific admiration when described as measurements of the 'velocity of thought.' The phrase 'quick as thought' had from time immemorial signified all that was wonderful and elusive of determination in the line of speed; and the way in which Science laid her doomful hand upon this mystery reminded people of the day when Franklin first '*eripuit cælo fulmen*,' foreshadowing the reign of a newer and colder race of gods. We shall take up the various operations measured, each in the chapter to which it more naturally pertains. I

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may say, however, immediately, that the phrase 'velocity of *thought*' is misleading, for it is by no means clear in any of the cases what particular act of thought occurs during the time which is measured. 'Velocity of nerve-action' is liable to the same criticism, for in most cases we do not know what particular nerve-processes occur. What the times in question really represent is the total duration of certain *reactions upon stimuli*. Certain of the conditions of the reaction are prepared beforehand; they consist in the assumption of those motor and sensory tensions which we name the expectant state. Just what happens during the actual time occupied by the reaction (in other words, just what is added to the pre-existent tensions to produce the actual discharge) is not made out at present, either from the neural or from the mental point of view.

The method is essentially the same in all these investigations. A signal of some sort is communicated to the subject, and at the same instant records itself on a time-registering apparatus. The subject then makes a muscular movement of some sort, which is the 'reaction,' and which also records itself automatically. The time found to have elapsed between the two records is the total time of that observation. The time-registering instruments are of various types. One type is that of the revolving drum covered with smoked paper, on which one electric pen traces a line which the signal breaks and the 'reaction' draws again; whilst another electric pen (connected with a pendulum or a rod of metal vibrating at a known rate) traces alongside of the former line a 'time-line' of which each undulation or link stands for a certain fraction of a second, and against which the break in the reaction-line can be measured. Compare Fig. 21, where the line is broken by the signal at the first arrow, and continued again by the reaction at the second. Ludwig's Kymograph, Marey's Chronograph are good examples of this type of instrument.

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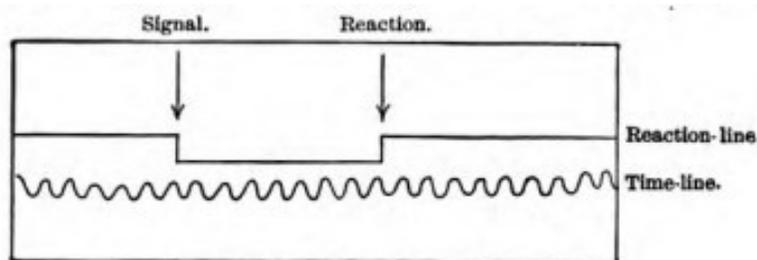


FIG. 21.

Another type of instrument is represented by the stopwatch, of which the most perfect form is Hipp's Chronoscope. The hand on the dial measures intervals as short as 1/1000 of a second. The signal (by an appropriate electric connection) starts it; the reaction stops it; and by reading off its initial and terminal positions we have immediately and with no farther trouble the time we seek. A still simpler instrument, though one not very satisfactory in its working, is the 'psychodometer' of Exner & Obersteiner, of which I picture a modification devised by my colleague Professor H. P. Bowditch, which works very well.

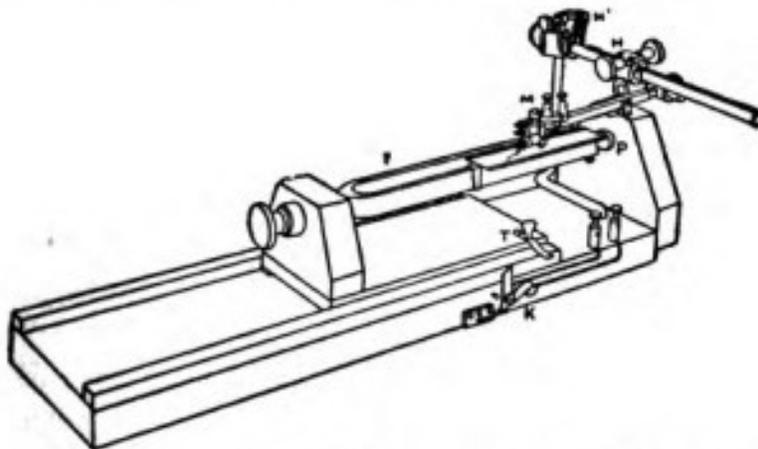


FIG. 22.—Bowditch's Reaction-timer. *F*, tuning-fork carrying a little plate which holds the paper on which the electric pen *M* makes the tracing, and sliding in grooves on the base-board. *P*, a plug which spreads the prongs of the fork apart when it is pushed forward to its extreme limit, and releases them when it is drawn back to a certain point. The fork then vibrates, and, its backward movement continuing, an undulating line is drawn on the smoked paper by the pen. At *T* is a tongue fixed to the carriage of the fork, and at *K* an electric key which the tongue opens and with which the electric pen is connected. At the instant of opening, the pen changes its place and the undulating line is drawn at a different level on the paper. The opening can be made to serve as a signal to the reactor in a variety of ways, and his reaction can be made to close the pen again, when the line returns to its first level. The reaction time = the number of undulations traced at the second level.

The manner in which the signal and reaction are connected with the chronographic apparatus varies indefinitely in different experiments. Every new problem requires some new electric or mechanical disposition of apparatus. [Pg 88]

The least complicated time-measurement is that known as *simple reaction-time*, in which there is but one possible signal and one possible movement, and both are known in advance. The movement is generally the closing of an electric key with the hand. The foot, the jaw, the lips, even the eyelid, have been in turn made organs of reaction, and the apparatus has been modified accordingly.^[107] The time usually elapsing between stimulus and movement lies between one and three tenths of a second, varying according to circumstances which will be mentioned anon.

The subject of experiment, whenever the reactions are short and regular, is in a state of extreme tension, and feels, when the signal comes, as if *it* started the reaction, by a sort of fatality, and as if no psychic process of perception or volition had a chance to intervene. The whole succession is so rapid that perception seems to be retrospective, and the time-order of events to be read off in memory rather than known at the moment. This at least is my own personal experience in the matter, and with it I find others to agree. The question is, What happens inside of us, either in brain or mind? and to answer that we must analyze just what processes the reaction involves. It is evident that some time is lost in each of the following stages:

1. The stimulus excites the peripheral sense-organ adequately for a current to pass into the sensory nerve;
2. The sensory nerve is traversed;
3. The transformation (or reflection) of the sensory into a motor current occurs in the centres;
4. The spinal cord and motor nerve are traversed;
5. The motor current excites the muscle to the contracting point.

Time is also lost, of course, outside the muscle, in the joints, skin, etc., and between the parts of the apparatus; and when the stimulus which serves as signal is applied to the skin of the trunk or limbs, time is lost in the sensorial conduction through the spinal cord. [Pg 89]

The stage marked 3 is the only one that interests us here. The other stages answer to purely physiological processes, but stage 3 is psycho-physical; that is, it is a higher-central process, and has probably some sort of consciousness accompanying it. What sort?

Wundt has little difficulty in deciding that it is consciousness of a quite elaborate kind. He distinguishes between two stages in the conscious reception of an impression, calling one *perception*, and the other *apperception*, and likening the one to the mere entrance of an object into the periphery of the field of vision, and the other to its coming to occupy the focus or point of view. *Inattentive awareness* of an object, and *attention* to it, are, it seems to me, equivalents for perception and apperception, as Wundt uses the words. To these two forms of awareness of the impression Wundt adds the conscious volition to react, gives to the trio the name of 'psycho-physical' processes, and assumes that they actually follow upon each other in the succession in which they have been named.^[108] So at least I understand him. The simplest way to determine the time taken up by this psycho-physical stage No. 3 would be to determine separately the duration of the several purely physical processes, 1, 2, 4, and 5, and to subtract them from the total reaction-time. Such attempts have been made.^[109] But the data for calculation are too inaccurate for use, and, as Wundt himself admits,^[110] the precise duration of stage 3 must at present be left enveloped with that of the other processes, in the total reaction-time. [Pg 90]

My own belief is that no such succession of conscious feelings as Wundt describes takes place during stage 3. It is a process of central excitement and discharge, with which doubtless some feeling coexists, but *what* feeling we cannot tell, because it is so fugitive and so immediately eclipsed by the more substantive and enduring memory of the impression as it came in, and of the executed movement of response. Feeling of the impression, attention to it, thought of the reaction, volition to react, *would*, undoubtedly, all be links of the process *under other conditions*,^[111] and would lead to the same reaction—after an indefinitely longer time. But these other conditions are not those of the experiments we are discussing; and it is mythological psychology (of which we shall see many later examples) to conclude that because two mental processes lead to the same result they must be similar in their inward subjective constitution. The feeling of stage 3 is certainly no articulate perception. It can be nothing but the mere sense of a reflex discharge. *The reaction whose time is measured is, in short, a reflex action pure and simple, and not a psychic act.* A foregoing psychic condition is, it is true, a prerequisite for this reflex action. The preparation of the attention and volition; the expectation of the signal and the readiness of the hand to move, the instant it shall come; the nervous tension in which the subject waits, are all conditions of the formation in him for the time being of a new path or arc of reflex discharge. The tract from the sense-organ which receives the stimulus, into the motor centre which discharges the reaction, is already tingling with premonitory innervation, is raised to such a pitch of heightened irritability by the expectant attention, that the signal is instantaneously sufficient to cause the overflow.^[112] No other tract of the nervous system is, at the moment, in this [Pg 91]

hair-trigger condition. The consequence is that one sometimes responds to a *wrong* signal, especially if it be an impression of the same *kind* with the signal we expect.^[113] But if by chance we are tired, or the signal is unexpectedly weak, and we do not react instantly, but only after an express perception that the signal has come, and an express volition, the time becomes quite disproportionately long (a second or more, according to Exner^[114]), and we feel that the process is in nature altogether different.

In fact, the reaction-time experiments are a case to which we can immediately apply what we have just learned about the summation of stimuli. 'Expectant attention' is but the subjective name for what objectively is a partial stimulation of a certain pathway, the pathway from the 'centre' for the signal to that for the discharge. In [Chapter XI](#) we shall see that all attention involves excitement from within of the tract concerned in feeling the objects to which attention is given. The tract here is the excito-motor arc about to be traversed. The signal is but the spark from without which touches off a train already laid. The performance, under these conditions, exactly resembles any reflex action. The only difference is that whilst, in the ordinarily so-called reflex acts, the reflex arc is a permanent result of organic growth, it is here a transient result of previous cerebral conditions.^[115]

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I am happy to say that since the preceding paragraphs (and the notes thereto appertaining) were written, Wundt has himself become converted to the view which I defend. He now admits that in the shortest reactions "there is neither apperception nor will, but that they are merely *brain-reflexes due to practice*."^[116] The means of his conversion are certain experiments performed in his laboratory by Herr L. Lange,^[117] who was led to distinguish between two ways of setting the attention in reacting on a signal, and who found that they gave very different time-results. In the '*extreme sensorial*' way, as Lange calls it, of reacting, one keeps one's mind as intent as possible upon the expected signal, and 'purposely avoids'^[118] thinking of the movement to be executed; in the '*extreme muscular*' way one 'does not think at all'^[119] of the signal, but stands as ready as possible for the movement. The muscular reactions are much shorter than the sensorial ones, the average difference being in the neighborhood of a tenth of a second. Wundt accordingly calls them 'shortened reactions' and, with Lange, admits them to be mere reflexes; whilst the sensorial reactions he calls 'complete,' and holds to his original conception as far as they are concerned. The facts, however, do not seem to me to warrant even this amount of fidelity to the original Wundtian position. When we begin to react in the '*extreme sensorial*' way, Lange says that we get times so very long that they must be rejected from the count as non-typical. "Only after the reactor has succeeded by repeated and conscientious practice in bringing about an extremely precise co-ordination of his voluntary impulse with his sense-impression do we get times which can be regarded as typical sensorial reaction-times."^[120] Now it seems to me that these excessive and 'untypical' times are probably the real 'complete times,' the only ones in which distinct processes of actual perception and volition occur (see above, [pp. 88-9](#)). The typical sensorial time which is attained by practice is probably another sort of reflex, less perfect than the reflexes prepared by straining one's attention towards the movement.^[121] The times are much more variable in the sensorial way than in the muscular. The several muscular reactions differ little from each other. Only in them does the phenomenon occur of reacting on a false signal, or of reacting before the signal. Times intermediate between these two types occur according as the attention fails to turn itself exclusively to one of the extremes. It is obvious that Herr Lange's distinction between the two types of reaction is a highly important one, and that the '*extreme muscular method*,' giving both the shortest times and the most constant ones, ought to be aimed at in all comparative investigations. Herr Lange's own muscular time averaged 0".123; his sensorial time, 0".230.

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These reaction-time experiments are then in no sense measurements of the swiftness of *thought*. Only when we complicate them is there a chance for anything like an intellectual operation to occur. They may be complicated in various ways. The reaction may be withheld

until the signal has consciously awakened a distinct idea (Wundt's discrimination-time, association-time) and then performed. Or there may be a variety of possible signals, each with a different reaction assigned to it, and the reactor may be uncertain which one he is about to receive. The reaction would then hardly seem to occur without a preliminary recognition and choice. We shall see, however, in the appropriate chapters, that the discrimination and choice involved in such a reaction are widely different from the intellectual operations of which we are ordinarily conscious under those names. Meanwhile the simple reaction-time remains as the starting point of all these superinduced complications. It is the fundamental physiological constant in all time-measurements. As such, its own variations have an interest, and must be briefly passed in review.^[122]

The reaction-time varies with the *individual* and his *age*. An individual may have it particularly long in respect of signals of one sense (Buccola, p. 147), but not of others. Old and uncultivated people have it long (nearly a second, in an old pauper observed by Exner, Pflüger's Archiv, vii, 612-4). Children have it long (half a second, Herzen in Buccola, p. 152).

Practice shortens it to a quantity which is for each individual a minimum beyond which no farther reduction can be made. The aforesaid old pauper's time was, after much practice, reduced to 0.1866 sec. (*loc. cit.* p. 626).

Fatigue lengthens it.

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Concentration of attention shortens it. Details will be given in the chapter on Attention.

The *nature of the signal* makes it vary.^[123] Wundt writes:

"I found that the reaction-time for impressions on the skin with electric stimulus is less than for true touch-sensations, as the following averages show:

	Average.	Average Variation
Sound	0.167 sec.	0.0221 sec.
Light	0.222 sec.	0.0219 sec.
Electric skin-sensation	0.201 sec.	0.0115 sec.
Touch-sensations	0.213 sec.	0.0134 sec.

"I here bring together the averages which have been obtained by some other observers:

	Hirsch.	Hankel.	Exner.
Sound	0.149	0.1505	0.1360
Light	0.200	0.2246	0.1506
Skin-sensation	0.182	0.1546	0.1337" ^[124]

Thermic reactions have been lately measured by A. Goldscheider and by Vintschgau (1887), who find them slower than reactions from touch. That from heat especially is very slow, more so than from cold, the differences (according to Goldscheider) depending on the nerve-terminations in the skin.

Gustatory reactions were measured by Vintschgau. They differed according to the substances used, running up to half a second as a maximum when identification took place. The mere perception of the presence of the substance on the tongue varied from 0".159 to 0".219 (Pflüger's Archiv, xiv, 529).

Olfactory reactions have been studied by Vintschgau, Buccola, and Beaunis. They are slow, averaging about half a second (cf. Beaunis, Recherches exp. sur l'Activité Cérébrale, 1884, p. 49 ff.).

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It will be observed that *sound* is more promptly reacted on than either *sight* or *touch*. *Taste* and *smell* are slower than either. One individual, who reacted to touch upon the tip of the

tongue in 0".125, took 0".993 to react upon the taste of quinine applied to the same spot. In another, upon the base of the tongue, the reaction to touch being 0".141, that to sugar was 0".552 (Vintschgau, quoted by Buccola, p. 103). Buccola found the reaction to odors to vary from 0".334 to 0".681, according to the perfume used and the individual.

The *intensity of the signal* makes a difference. The intenser the stimulus the shorter the time. Herzen (Grundlinien einer allgem. Psychophysiologie, p. 101) compared the reaction from a *corn* on the toe with that from the skin of the hand of the same subject. The two places were stimulated simultaneously, and the subject tried to react simultaneously with both hand and foot, but the foot always went quickest. When the sound skin of the foot was touched instead of the corn, it was the hand which always reacted first. Wundt tries to show that when the signal is made barely perceptible, the time is probably the same in all the senses, namely, about 0.332" (Physiol. Psych., 2d ed., ii, 224).

Where the signal is of touch, the place to which it is applied makes a difference in the resultant reaction-time. G. S. Hall and V. Kries found (Archiv f. Anat. u. Physiol., 1879) that when the finger-tip was the place the reaction was shorter than when the middle of the upper arm was used, in spite of the greater length of nerve-trunk to be traversed in the latter case. This discovery invalidates the measurements of the rapidity of transmission of the current in human nerves, for they are all based on the method of comparing reaction-times from places near the root and near the extremity of a limb. The same observers found that signals seen by the periphery of the retina gave longer times than the same signals seen by direct vision.

The *season* makes a difference, the time being some hundredths of a second shorter on cold winter days (Vintschgau *apud* Exner, Hermann's Hdbh., p. 270). [Pg 97]

Intoxicants alter the time. *Coffee* and *tea* appear to shorten it. Small doses of *wine* and *alcohol* first shorten and then lengthen it; but the shortening stage tends to disappear if a large dose be given immediately. This, at least, is the report of two German observers. Dr. J. W. Warren, whose observations are more thorough than any previous ones, could find no very decided effects from ordinary doses (Journal of Physiology, viii, 311). *Morphia* lengthens the time. *Amyl-nitrite* lengthens it, but after the inhalation it may fall to less than the normal. Ether and chloroform lengthen it (for authorities, etc., see Buccola, p. 189).

Certain *diseased states* naturally lengthen the time.

The *hypnotic trance* has no constant effect, sometimes shortening and sometimes lengthening it (Hall, Mind, viii, 170; James, Proc. Am. Soc. for Psych. Research, 246).

The time taken to *inhibit* a movement (e.g. to cease contraction of jaw-muscles) seems to be about the same as to produce one (Gad, Archiv f. (Anat. u.) Physiol., 1887, 468; Orchansky, *ibid.* 1889, 1885).

An immense amount of work has been done on reaction-time, of which I have cited but a small part. It is a sort of work which appeals particularly to patient and exact minds, and they have not failed to profit by the opportunity.

CEREBRAL BLOOD-SUPPLY.

The next point to occupy our attention is the *changes of circulation which accompany cerebral activity*.

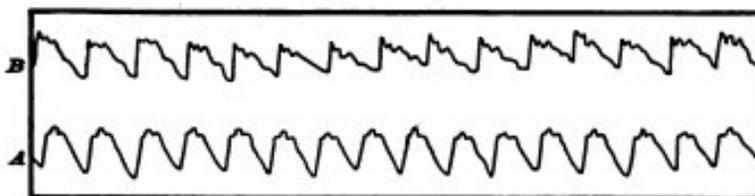


FIG. 23.—Sphygmographic pulse-tracing. *A*, during intellectual repose; *B*, during intellectual activity. (Mosso.)

All parts of the cortex, when electrically excited, produce alterations both of respiration and circulation. The blood-pressure rises, as a rule, all over the body, no matter where the cortical irritation is applied, though the motor zone is the most sensitive region for the purpose. Elsewhere the current must be strong enough for an epileptic attack to be produced.

[125] Slowing and quickening of the heart are also observed, and are independent of the vaso-constrictive phenomenon. Mosso, using his ingenious 'plethysmograph' as an indicator, discovered that the blood-supply to the arms diminished during intellectual activity, and found furthermore that the arterial tension (as shown by the sphygmograph) was increased in these members (see Fig. 23). So slight an emotion as that produced by the entrance of Professor Ludwig into the laboratory was instantly followed by a shrinkage of the arms.^[126] The brain itself is an excessively vascular organ, a sponge full of blood, in fact; and another of Mosso's inventions showed that when less blood went to the arms, more went to the head. The subject to be observed lay on a delicately balanced table which could tip downward either at the head or at the foot if the weight of either end were increased. The moment emotional or intellectual activity began in the subject, down went the balance at the head-end, in consequence of the redistribution of blood in his system. But the best proof of the immediate afflux of blood to the brain during mental activity is due to Mosso's observations on three persons whose brain had been laid bare by lesion of the skull. By means of apparatus described in his book,^[127] this physiologist was enabled to let the brain-pulse record itself directly by a tracing. The intra-cranial blood-pressure rose immediately whenever the subject was spoken to, or when he began to think actively, as in solving a problem in mental arithmetic. Mosso gives in his work a large number of reproductions of tracings which show the instantaneity of the change of blood-supply, whenever the mental activity was quickened by any cause whatever, intellectual or emotional. He relates of his female subject that one day whilst tracing her brain-pulse he observed a sudden rise with no apparent outer or inner cause. She however confessed to him afterwards that at that moment she had caught sight of a *skull* on top of a piece of furniture in the room, and that this had given her a slight emotion.

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The fluctuations of the blood supply to the brain were independent of respiratory changes,^[128] and followed the quickening of mental activity almost immediately. We must suppose a very delicate adjustment whereby the circulation follows the needs of the cerebral activity. Blood very likely may rush to each region of the cortex according as it is most active, but of this we know nothing. I need hardly say that the activity of the nervous matter is the primary phenomenon, and the afflux of blood its secondary consequence. Many popular writers talk as if it were the other way about, and as if mental activity were due to the afflux of blood. But, as Professor H. N. Martin has well said, "that belief has no physiological foundation whatever; it is even directly opposed to all that we know of cell life."^[129] A chronic pathological congestion may, it is true, have secondary consequences, but the primary congestions which we have been considering *follow* the activity of the brain-cells by an adaptive reflex vaso-motor mechanism doubtless as elaborate as that which harmonizes blood-supply with cell-action in any muscle or gland.

Of the changes in the cerebral circulation during sleep I will speak in the chapter which treats of that subject.

CEREBRAL THERMOMETRY.

Brain-activity seems accompanied by a local disengagement of heat. The earliest careful work in this direction was by Dr. J. S. Lombard in 1867. Dr. Lombard's latest results include the records of over 60,000 observations.^[130] He noted the changes in delicate thermometers

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and electric piles placed against the scalp in human beings, and found that any intellectual effort, such as computing, composing, reciting poetry silently or aloud, and especially that emotional excitement such as an anger fit, caused a general rise of temperature, which rarely exceeded a degree Fahrenheit. The rise was in most cases more marked in the middle region of the head than elsewhere. Strange to say, it was greater in reciting poetry silently than in reciting it aloud. Dr. Lombard's explanation is that "in internal recitation an additional portion of energy, which in recitation aloud was converted into nervous and muscular force, now appears as heat."^[131] I should suggest rather, if we must have a theory, that the surplus of heat in recitation to one's self is due to inhibitory processes which are absent when we recite aloud. In the chapter on the Will we shall see that the *simple* central process is to *speak* when we think; to think silently involves a check in addition. In 1870 the indefatigable Schiff took up the subject, experimenting on live dogs and chickens, plunging thermo-electric needles into the substance of their brain, to eliminate possible errors from vascular changes in the skin when the thermometers were placed upon the scalp. After habituation was established, he tested the animals with various sensations, tactile, optic, olfactory, and auditory. He found very regularly an immediate deflection of the galvanometer, indicating an abrupt alteration of the intra-cerebral temperature. When, for instance, he presented an empty roll of paper to the nose of his dog as it lay motionless, there was a small deflection, but when a piece of meat was in the paper the deflection was much greater. Schiff concluded from these and other experiments that sensorial activity heats the brain-tissue, but he did not try to localize the increment of heat beyond finding that it was in both hemispheres, whatever might be the sensation applied.^[132] Dr. R. W. Amidon in 1880 made a farther step forward, in localizing the heat produced by voluntary muscular contractions. Applying a number of delicate surface-thermometers simultaneously against the scalp, he found that when different muscles of the body were made to contract vigorously for ten minutes or more, different regions of the scalp rose in temperature, that the regions were well focalized, and that the rise of temperature was often considerably over a Fahrenheit degree. As a result of his investigations he gives a diagram in which numbered regions represent the centres of highest temperature for the various special movements which were investigated. To a large extent they correspond to the centres for the same movements assigned by Ferrier and others on other grounds; only they cover more of the skull.^[133]

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Phosphorus and Thought.

Chemical action must of course accompany brain-activity. But little definite is known of its exact nature. Cholesterin and creatin are both excrementitious products, and are both found in the brain. The subject belongs to chemistry rather than to psychology, and I only mention it here for the sake of saying a word about a wide-spread popular error about brain-activity and phosphorus. '*Ohne Phosphor, kein Gedanke*,' was a noted war-cry of the 'materialists' during the excitement on that subject which filled Germany in the '60s. The brain, like every other organ of the body, contains phosphorus, and a score of other chemicals besides. Why the phosphorus should be picked out as its essence, no one knows. It would be equally true to say '*Ohne Wasser kein Gedanke*,' or '*Ohne Kochsalz kein Gedanke*'; for thought would stop as quickly if the brain should dry up or lose its NaCl as if it lost its phosphorus. In America the phosphorus-delusion has twined itself round a saying quoted (rightly or wrongly) from Professor L. Agassiz, to the effect that fishermen are more intelligent than farmers because they eat so much fish, which contains so much phosphorus. All the facts may be doubted.

The only straight way to ascertain the importance of phosphorus to thought would be to find whether more is excreted by the brain during mental activity than during rest. Unfortunately we cannot do this directly, but can only gauge the amount of PO₅ in the urine, which

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represents other organs as well as the brain, and this procedure, as Dr. Edes says, is like measuring the rise of water at the mouth of the Mississippi to tell where there has been a thunder-storm in Minnesota.^[134] It has been adopted, however, by a variety of observers, some of whom found the phosphates in the urine diminished, whilst others found them increased, by intellectual work. On the whole, it is impossible to trace any constant relation. In maniacal excitement less phosphorus than usual seems to be excreted. More is excreted during sleep. There are differences between the alkaline and earthy phosphates into which I will not enter, as my only aim is to show that the popular way of looking at the matter has no exact foundation.^[135] The fact that phosphorus-preparations may do good in nervous exhaustion proves nothing as to the part played by phosphorus in mental activity. Like iron, arsenic, and other remedies it is a stimulant or tonic, of whose intimate workings in the system we know absolutely nothing, and which moreover does good in an extremely small number of the cases in which it is prescribed.

The phosphorus-philosophers have often compared thought to a secretion. "The brain secretes thought, as the kidneys secrete urine, or as the liver secretes bile," are phrases which one sometimes hears. The lame analogy need hardly be pointed out. The materials which the brain *pours into the blood* (cholesterin, creatin, xanthin, or whatever they may be) are the analogues of the urine and the bile, being in fact real material excreta. As far as these matters go, the brain is a ductless gland. But we know of nothing connected with liver-and kidney-activity which can be in the remotest degree compared with the stream of thought that accompanies the brain's material secretions.

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There remains another feature of general brain-physiology, and indeed for psychological purposes the most important feature of all. I refer to the aptitude of the brain for acquiring *habits*. But I will treat of that in a chapter by itself.

[99] I shall myself in later places indulge in much of this schematization. The reader will understand once for all that it is symbolic; and that the use of it is hardly more than to show what a deep congruity there is between mental processes and mechanical processes of *some* kind, not necessarily of the exact kind portrayed.

[100] Valentin: Archiv f. d. gesamt. Physiol., 1873, p. 458. Stirling: Leipzig Acad. Berichte, 1875, p. 372 (Journal of Physiol., 1875). J. Ward: Archiv f. (Anat. u.) Physiol., 1880, p. 72. H. Sewall: Johns Hopkins Studies, 1880, p. 30. Kronecker u. Nicolaides: Archiv f. (Anat. u.) Physiol., 1880, p. 437. Exner: Archiv f. die ges. Physiol., Bd. 28, p. 487 (1882). Eckhard: in Hermann's Hdbch. d. Physiol., Bd. I, Thl. ii, p. 31. François-Franck: Leçons sur les Fonctions motrices du Cerveau, p. 51 ff., 339.—For the process of summation in *nerves* and *muscles*, cf. Hermann: *ibid.* Thl. i, p. 109, and vol. i, p. 40. Also Wundt: Physiol. Psych., i, 243 ff.; Richet: Travaux du Laboratoire de Marey, 1877, p. 97; L'Homme et l'Intelligence, pp. 24 ff., 468; Revue Philosophique, t. xxi, p. 564. Kronecker u. Hall: Archiv f. (Anat. u.) Physiol., 1879; Schönlein: *ibid.* 1882, p. 357. Sertoli (Hofmann and Schwalbe's Jahres-bericht), 1882, p. 25. De Watteville: Neurologisches Centralblatt, 1883, No. 7. Grünhagen: Arch. f. d. ges. Physiol., Bd. 34, p. 301 (1884).

[101] Bubnoff und Heidenhain: Ueber Erregungs- und Hemmungsvorgänge innerhalb der motorischen Hirncentren. Archiv f. d. ges. Physiol., Bd. 26, p. 156 (1881).

[102] Archiv f. d. ges. Physiol., Bd. 26, p. 176 (1881). Exner thinks (*ibid.* Bd. 28, p. 497 (1882)) that the summation here occurs in the spinal cord. It makes no difference where this particular summation occurs, so far as the general philosophy of summation goes.

- [103] G H. Lewes: Physical Basis of Mind, p. 479, where many similar examples are given, 487-9.
- [104] Romanes: Mental Evolution in Animals, p. 168.
- [105] See a similar instance in Mach: Beiträge zur Analyse der Empfindungen, p. 36, a sparrow being the animal. My young children are afraid of their own pug-dog, if he enters their room after they are in bed and the lights are out. Compare this statement also: "The first question to a peasant seldom proves more than a flapper to rouse the torpid adjustments of his ears. The invariable answer of a Scottish peasant is, 'What's your wull?'—that of the English, a vacant stare. A second and even a third question may be required to elicit an answer." (R. Fowler; Some Observations on the Mental State of the Blind, and Deaf, and Dumb (Salisbury, 1843), p. 14.)
- [106] The reader will find a great deal about chronographic apparatus in J. Marey: La Méthode Graphique, pt. ii, chap. ii. One can make pretty fair measurements with no other instrument than a watch, by making a large number of reactions, each serving as a signal for the following one, and dividing the total time they take by their number. Dr. O. W. Holmes first suggested this method, which has been ingeniously elaborated and applied by Professor Jastrow. See 'Science' for September 10, 1886.
- [107] See, for a few modifications, Cattell, Mind, xi, 220 ff.
- [108] Physiol. Psych., ii, 221-2. Cf. also the first edition, 728-9. I must confess to finding all Wundt's utterances about 'apperception' both vacillating and obscure. I see no use whatever for the word, as he employs it, in Psychology. Attention, perception, conception, volition, are its ample equivalents. Why we should need a single word to denote all these things by turns, Wundt fails to make clear. Consult, however, his pupil Staude's article, 'Ueber den Begriff der Apperception,' etc., in Wundt's periodical Philosophische Studien, i, 149, which may be supposed official. For a minute criticism of Wundt's 'apperception,' see Marty: Vierteljahrschrift f. wiss. Philos., x, 346.
- [109] By Exner, for example, Pflüger's Archiv, vii, 628 ff.
- [110] P. 222. Cf. also Richet, Rev. Philos., vi, 395-6.
- [111] For instance, if, on the previous day, one had resolved to act on a signal when it should come, and it now came whilst we were engaged in other things, and reminded us of the resolve.
- [112] "I need hardly mention that success in these experiments depends in a high degree on our concentration of attention. If inattentive, one gets very discrepant figures.... This concentration of the attention is in the highest degree exhausting. After some experiments in which I was concerned to get results as uniform as possible, I was covered with perspiration and excessively fatigued although I had sat quietly in my chair all the while." (Exner, *loc. cit.* vii, 618.)
- [113] Wundt, Physiol. Psych., ii, 226
- [114] Pflüger's Archiv, vii, 616.
- [115] In short, what M. Delbœuf calls an '*organe adventice*.' The reaction-time, moreover, is quite compatible with the reaction itself being of a reflex order. Some reflexes (sneezing, e.g.) are very slow. The only time-measurement of a reflex act in the human subject with which I am acquainted is Exner's measurement of winking (in Pflüger's Archiv f. d. gesamt. Physiol., Bd. viii, p. 526, 1874). He found that when the stimulus was a flash of light it took the wink 0.2168 sec. to occur. A strong electric shock to the cornea shortened the time to 0.0578 sec. The ordinary 'reaction-time' is midway between these values. Exner 'reduces' his times by eliminating the physiological process of conduction. His 'reduced minimum winking-time' is then 0.0471 (*ibid.* 531), whilst his reduced reaction-time is

0.0828 (*ibid.* vii, 637). These figures have really no scientific value beyond that of showing, according to Exner's own belief (vii, 531), that reaction-time and reflex-time measure processes of essentially the same order. His description, moreover, of the process is an excellent description of a reflex act. "Every one," says he, "who makes reaction-time experiments for the first time is surprised to find how little he is master of his own movements, so soon as it becomes a question of executing them with a maximum of speed. Not only does their energy lie, as it were, outside the field of choice, but even the time in which the movement occurs depends only partly upon ourselves. We jerk our arm, and we can afterwards tell with astonishing precision whether we have jerked it quicker or slower than another time, although we have no power to jerk it exactly at the wished-for moment."—Wundt himself admits that when we await a strong signal with tense preparation there is no consciousness of any duality of 'apperception' and motor response; the two are continuous (*Physiol. Psych.*, ii, 226).—Mr. Cattell's view is identical with the one I defend. "I think," he says, "that if the processes of perception and willing are present at all they are very rudimentary.... The subject, by a voluntary effort [before the signal comes], puts the lines of communication between the centre for" the stimulus "and the centre for the co-ordination of motions ... in a state of unstable equilibrium. When, therefore, a nervous impulse reaches the" former centre, "it causes brain-changes in two directions; an impulse moves along to the cortex and calls forth there a perception corresponding to the stimulus, while at the same time an impulse follows a line of small resistance to the centre for the co-ordination of motions, and the proper nervous impulse, already prepared and waiting for the signal, is sent from the centre to the muscle of the hand. When the reaction has often been made the entire cerebral process becomes automatic, the impulse of itself takes the well-travelled way to the motor centre, and releases the motor impulse." (*Mind*, xi, 232-3.)—Finally, Prof. Lipps has, in his elaborate way (*Grundtatsachen*, 179-188), made mince-meat of the view that stage 3 involves either conscious perception or conscious will.

- [116] *Physiol. Psych.*, 3d edition (1887), vol. ii, p. 266.
- [117] *Philosophische Studien*, vol. iv, p. 479 (1888).
- [118] *Loc. cit.* p. 488.
- [119] *Loc. cit.* p. 487.
- [120] *Loc. cit.* p. 489.
- [121] Lange has an interesting hypothesis as to the brain-process concerned in the latter, for which I can only refer to his essay.
- [122] The reader who wishes to know more about the matter will find a most faithful compilation of all that has been done, together with much original matter, in G. Buccola's 'Legge del Tempo,' etc. See also chapter xvi of Wundt's *Physiol. Psychology*; Exner in Hermann's *Hdbch.*, Bd. 2, Thl. ii, pp. 252-280; also Ribot's *Contemp. Germ. Psych.* chap. viii.
- [123] The nature of the movement also seems to make it vary. Mr. B. I. Gilman and I reacted to the same signal by simply raising our hand, and again by carrying our hand towards our back. The moment registered was always that at which the hand broke an electric contact in *starting* to move. But it started one or two hundredths of a second later when the more extensive movement was the one to be made. Orchansky, on the other hand, experimenting on contractions of the masseter muscle, found (*Archiv f. (Anat. u.) Physiol.*, 1889, p. 187) that the greater the amplitude of contraction intended, the shorter grew the time of reaction. He explains this by the fact that a more ample contraction makes a greater *appeal to the attention*, and that this shortens the times.
- [124] *Physiol. Psych.*, ii, 223.
- [125] François-Franck, *Fonctions Motrices*, Leçon xxii.

- [126] *La Paura* (1884), p. 117.
- [127] *Ueber den Kreislauf des Blutes im menschlichen Gehirn* (1881), chap. ii. The Introduction gives the history of our previous knowledge of the subject.
- [128] In this conclusion M. Gley (*Archives de Physiologie*, 1881, p. 742) agrees with Professor Mosso. Gley found his pulse rise 1-3 beats, his carotid dilate, and his radial artery contract during hard mental work.
- [129] Address before Med. and Chirurg. Society of Maryland, 1879.
- [130] See his book; "Experimental Researches on the Regional Temperature of the Head" (London, 1879).
- [131] *Loc. cit.* p. 195.
- [132] The most convenient account of Schiff's experiments is by Prof. Hierzen, in the *Revue Philosophique*, vol. iii, p. 36.
- [133] *A New Study of Cerebral Cortical Localization* (N. Y., Putnam, 1880), pp. 48-53.
- [134] *Archives of Medicine*, vol. x, No. 1 (1883).
- [135] Without multiplying references, I will simply cite Mendel (*Archiv f. Psychiatrie*, vol. iii, 1871), Mairet (*Archives de Neurologie*, vol. ix, 1885), and Beaunis (*Rech. Expérimentales sur l'Activité Cérébrale*, 1887). Richet gives a partial bibliography in the *Revue Scientifique*, vol. 38, p. 788 (1886).

CHAPTER IV.^[136]

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HABIT.

When we look at living creatures from an outward point of view, one of the first things that strike us is that they are bundles of habits. In wild animals, the usual round of daily behavior seems a necessity implanted at birth; in animals domesticated, and especially in man, it seems, to a great extent, to be the result of education. The habits to which there is an innate tendency are called instincts; some of those due to education would by most persons be called acts of reason. It thus appears that habit covers a very large part of life, and that one engaged in studying the objective manifestations of mind is bound at the very outset to define clearly just what its limits are.

The moment one tries to define what habit is, one is led to the fundamental properties of matter. The laws of Nature are nothing but the immutable habits which the different elementary sorts of matter follow in their actions and reactions upon each other. In the organic world, however, the habits are more variable than this. Even instincts vary from one individual to another of a kind; and are modified in the same individual, as we shall later see, to suit the exigencies of the case. The habits of an elementary particle of matter cannot change (on the principles of the atomistic philosophy), because the particle is itself an unchangeable thing; but those of a compound mass of matter can change, because they are in the last instance due to the structure of the compound, and either outward forces or inward tensions can, from one hour to another, turn that structure into something different from what it was. That is, they can do so if the body be plastic enough to maintain its integrity, and be not disrupted when its structure yields.

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The change of structure here spoken of need not involve the outward shape; it may be invisible and molecular, as when a bar of iron becomes magnetic or crystalline through the action of certain outward causes, or India-rubber becomes friable, or plaster 'sets.' All these changes are rather slow; the material in question opposes a certain resistance to the

modifying cause, which it takes time to overcome, but the gradual yielding whereof often saves the material from being disintegrated altogether. When the structure has yielded, the same inertia becomes a condition of its comparative permanence in the new form, and of the new habits the body then manifests. *Plasticity*, then, in the wide sense of the word, means the possession of a structure weak enough to yield to an influence, but strong enough not to yield all at once. Each relatively stable phase of equilibrium in such a structure is marked by what we may call a new set of habits. Organic matter, especially nervous tissue, seems endowed with a very extraordinary degree of plasticity of this sort; so that we may without hesitation lay down as our first proposition the following, that *the phenomena of habit in living beings are due to the plasticity*^[137] *of the organic materials of which their bodies are composed.*

But the philosophy of habit is thus, in the first instance, a chapter in physics rather than in physiology or psychology. That it is at bottom a physical principle is admitted by all good recent writers on the subject. They call attention to analogues of acquired habits exhibited by dead matter. Thus, M. Léon Dumont, whose essay on habit is perhaps the most philosophical account yet published, writes:

"Every one knows how a garment, after having been worn a certain time, clings to the shape of the body better than when it was new; there has been a change in the tissue, and this change is a new habit of cohesion. A lock works better after being used some time; at the outset more force was required to overcome certain roughnesses in the mechanism. The overcoming of their resistance is a phenomenon of habituation. It costs less trouble to fold a paper when it has been folded already. This saving of trouble is due to the essential nature of habit, which brings it about that, to reproduce the effect, a less amount of the outward cause is required. The sounds of a violin improve by use in the hands of an able artist, because the fibres of the wood at last contract habits of vibration conformed to harmonic relations. This is what gives such inestimable value to instruments that have belonged to great masters. Water, in flowing, hollows out for itself a channel, which grows broader and deeper; and, after having ceased to flow, it resumes, when it flows again, the path traced by itself before. Just so, the impressions of outer objects fashion for themselves in the nervous system more and more appropriate paths, and these vital phenomena recur under similar excitements from without, when they have been interrupted a certain time."^[138]

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Not in the nervous system alone. A scar anywhere is a *locus minoris resistentiæ*, more liable to be abraded, inflamed, to suffer pain and cold, than are the neighboring parts. A sprained ankle, a dislocated arm, are in danger of being sprained or dislocated again; joints that have once been attacked by rheumatism or gout, mucous membranes that have been the seat of catarrh, are with each fresh recurrence more prone to a relapse, until often the morbid state chronically substitutes itself for the sound one. And if we ascend to the nervous system, we find how many so-called functional diseases seem to keep themselves going simply because they happen to have once begun; and how the forcible cutting short by medicine of a few attacks is often sufficient to enable the physiological forces to get possession of the field again, and to bring the organs back to functions of health. Epilepsies, neuralgias, convulsive affections of various sorts, insomnias, are so many cases in point. And, to take what are more obviously habits, the success with which a 'weaning' treatment can often be applied to the victims of unhealthy indulgence of passion, or of mere complaining or irascible disposition, shows us how much the morbid manifestations themselves were due to the mere inertia of the nervous organs, when once launched on a false career.

Can we now form a notion of what the inward physical changes may be like, in organs whose habits have thus struck into new paths? In other words, can we say just what mechanical facts the expression 'change of habit' covers when it is applied to a nervous system? Certainly we cannot in anything like a minute or definite way. But our usual scientific custom of interpreting hidden molecular events after the analogy of visible massive ones enables us to frame easily an abstract and general scheme of processes which the physical changes in question *may* be like. And when once the possibility of *some* kind of mechanical interpretation is established, Mechanical Science, in her present mood, will not hesitate to set her brand of ownership upon the matter, feeling sure that it is only a question of time when the exact mechanical explanation of the case shall be found out.

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If habits are due to the plasticity of materials to outward agents, we can immediately see to what outward influences, if to any, the brain-matter is plastic. Not to mechanical pressures, not to thermal changes, not to any of the forces to which all the other organs of our body are exposed; for nature has carefully shut up our brain and spinal cord in bony boxes, where no influences of this sort can get at them. She has floated them in fluid so that only the severest shocks can give them a concussion, and blanketed and wrapped them about in an altogether exceptional way. The only impressions that can be made upon them are through the blood, on the one hand, and through the sensory nerve-roots, on the other; and it is to the infinitely attenuated currents that pour in through these latter channels that the hemispherical cortex shows itself to be so peculiarly susceptible. The currents, once in, must find a way out. In getting out they leave their traces in the paths which they take. The only thing they *can* do, in short, is to deepen old paths or to make new ones; and the whole plasticity of the brain sums itself up in two words when we call it an organ in which currents pouring in from the sense-organs make with extreme facility paths which do not easily disappear. For, of course, a simple habit, like every other nervous event—the habit of snuffing, for example, or of putting one's hands into one's pockets, or of biting one's nails—is, mechanically, nothing but a reflex discharge; and its anatomical substratum must be a path in the system. The most complex habits, as we shall presently see more fully, are, from the same point of view, nothing but *concatenated* discharges in the nerve-centres, due to the presence there of systems of reflex paths, so organized as to wake each other up successively—the impression produced by one muscular contraction serving as a stimulus to provoke the next, until a final impression inhibits the process and closes the chain. The only difficult mechanical problem is to explain the formation *de novo* of a simple reflex or path in a pre-existing nervous system. Here, as in so many other cases, it is only the *premier pas qui coûte*. For the entire nervous system *is* nothing but a system of paths between a sensory *terminus a quo* and a muscular, glandular, or other *terminus ad quem*. A path once traversed by a nerve-current might be expected to follow the law of most of the paths we know, and to be scooped out and made more permeable than before;^[139] and this ought to be repeated with each new passage of the current. Whatever obstructions may have kept it at first from being a path should then, little by little, and more and more, be swept out of the way, until at last it might become a natural drainage-channel. This is what happens where either solids or liquids pass over a path; there seems no reason why it should not happen where the thing that passes is a mere wave of rearrangement in matter that does not displace itself, but merely changes chemically or turns itself round in place, or vibrates across the line. The most plausible views of the nerve-current make it out to be the passage of some such wave of rearrangement as this. If only a part of the matter of the path were to 'rearrange' itself, the neighboring parts remaining inert, it is easy to see how their inertness might oppose a friction which it would take many waves of rearrangement to break down and overcome. If we call the path itself the 'organ,' and the wave of rearrangement the 'function,' then it is obviously a case for repeating the celebrated French formula of '*La fonction fait l'organe*.'

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So nothing is easier than to imagine how, when a current once has traversed a path, it should traverse it more readily still a second time. But what made it ever traverse it the first time? ^[140] In answering this question we can only fall back on our general conception of a

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nervous system as a mass of matter whose parts, constantly kept in states of different tension, are as constantly tending to equalize their states. The equalization between any two points occurs through whatever path may at the moment be most pervious. But, as a given point of the system may belong, actually or potentially, to many different paths, and, as the play of nutrition is subject to accidental changes, *blocks* may from time to time occur, and make currents shoot through unwonted lines. Such an unwonted line would be a new-created path, which if traversed repeatedly, would become the beginning of a new reflex arc. All this is vague to the last degree, and amounts to little more than saying that a new path may be formed by the sort of *chances* that in nervous material are likely to occur. But, vague as it is, it is really the last word of our wisdom in the matter.^[141]

It must be noticed that the growth of structural modification in living matter may be more rapid than in any lifeless mass, because the incessant nutritive renovation of which the living matter is the seat tends often to corroborate and fix the impressed modification, rather than to counteract it by renewing the original constitution of the tissue that has been impressed. Thus, we notice after exercising our muscles or our brain in a new way, that we can do so no longer at that time; but after a day or two of rest, when we resume the discipline, our increase in skill not seldom surprises us. I have often noticed this in learning a tune; and it has led a German author to say that we learn to swim during the winter and to skate during the summer.

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Dr. Carpenter writes:^[142]

"It is a matter of universal experience that every kind of training for special aptitudes is both far more effective, and leaves a more permanent impress, when exerted on the *growing* organism than when brought to bear on the adult. The effect of such training is shown in the tendency of the organ to 'grow to' the mode in which it is habitually exercised; as is evidenced by the increased size and power of particular sets of muscles, and the extraordinary flexibility of joints, which are acquired by such as have been early exercised in gymnastic performances.... There is no part of the organism of man in which the *reconstructive activity* is so great, during the whole period of life, as it is in the ganglionic substance of the brain. This is indicated by the enormous supply of blood which it receives.... It is, moreover, a fact of great significance that the nerve-substance is specially distinguished by its *reparative* power. For while injuries of other tissues (such as the muscular) which are distinguished by the *speciality* of their structure and endowments, are repaired by substance of a lower or less specialized type, those of nerve-substance are repaired by a complete reproduction of the normal tissue; as is evidenced in the sensibility of the newly forming skin which is closing over an open wound, or in the recovery of the sensibility of a piece of 'transplanted' skin, which has for a time been rendered insensible by the complete interruption of the continuity of its nerves. The most remarkable example of this reproduction, however, is afforded by the results of M. Brown-Séquard's^[143] experiments upon the gradual restoration of the functional activity of the spinal cord after its complete division; which takes place in a way that indicates rather a *reproduction* of the whole, or the lower part of the cord and of the nerves proceeding from it, than a mere *reunion* of divided surfaces. This reproduction is but a special manifestation of the reconstructive change which is *always* taking place in the nervous system; it being not less obvious to the eye of reason that the 'waste' occasioned by its functional activity must be constantly repaired by the production of new tissue, than it is to the eye of sense that such reparation supplies an actual *loss* of substance by disease or injury.

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"Now, in this constant and active reconstruction of the nervous system, we recognize a most marked conformity to the general plan manifested in the nutrition of the organism as a whole. For, in the first place, it is obvious that there is a tendency to the production of a *determinate type* of structure; which type is often not merely that of the species, but some special modification of it which characterized one or both of the progenitors. But this type is peculiarly liable to modification during the early period of life; in which the functional activity of the nervous system (and particularly of the brain) is extraordinarily great, and the reconstructive process proportionally active. And this modifiability expresses itself in the formation of the mechanism by which those *secondarily automatic* modes of movement come to be established, which, in man, take the place of those that are *congenital* in most of the animals beneath him; and those modes of sense-perception come to be *acquired*, which are elsewhere clearly *instinctive*. For there can be no reasonable doubt that, in both cases, a nervous mechanism is *developed* in the course of this self-education, corresponding with that which the lower animals inherit from their parents. The *plan* of that *rebuilding* process, which is necessary to maintain the integrity of the organism generally, and which goes on with peculiar activity in this portion of it, is thus being incessantly modified; and in this manner all that portion of it which ministers to the *external* life of sense and motion that is shared by man with the animal kingdom at large, becomes at adult age the expression of the habits which the individual has acquired during the period of growth and development. Of these habits, some are common to the race generally, while others are peculiar to the individual; those of the former kind (such as walking erect) being universally acquired, save where physical inability prevents; while for the latter a special training is needed, which is usually the more effective the earlier it is begun—as is remarkably seen in the case of such feats of dexterity as require a conjoint education of the perceptive and of the motor powers. And when thus developed during the period of growth, so as to have become a part of the constitution of the adult, the acquired mechanism is thenceforth maintained in the ordinary course of the nutritive operations, so as to be ready for use when called upon, even after long inaction.

"What is so clearly true of the nervous apparatus of animal life can scarcely be otherwise than true of that which ministers to the automatic activity of the mind. For, as already shown, the study of psychology has evolved no more certain result than that there are uniformities of mental action which are so entirely conformable to those of bodily action as to indicate their intimate relation to a 'mechanism of thought and feeling,' acting under the like conditions with that of sense and motion. The psychical principles of *association*, indeed, and the physiological principles of *nutrition*, simply express—the former in terms of mind, the latter in terms of brain—the universally admitted fact that any sequence of mental action which has been frequently repeated tends to perpetuate itself; so that we find ourselves automatically prompted to *think, feel, or do* what we have been before accustomed to think, feel, or do, under like circumstances, without any consciously formed *purpose*, or anticipation of results. For there is no reason to regard the cerebrum as an exception to the general principle that, while each part of the organism tends to *form itself* in accordance with the mode in which it is habitually exercised, this tendency will be especially strong in the nervous apparatus, in virtue of that *incessant regeneration* which is the very condition of its functional activity. It scarcely, indeed, admits of doubt that every state of ideational consciousness which is either *very strong* or is *habitually repeated* leaves an organic impression on the cerebrum; in virtue of which that same state may be reproduced at any future time, in response to a suggestion

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fitted to excite it.... The 'strength of early association' is a fact so universally recognized that the expression of it has become proverbial; and this precisely accords with the physiological principle that, during the period of growth and development, the formative activity of the brain will be most amenable to directing influences. It is in this way that what is early 'learned by heart' becomes branded in (as it were) upon the cerebrum; so that its 'traces' are never lost, even though the conscious memory of it may have completely faded out. For, when the organic modification has been once *fixed* in the growing brain, it becomes a part of the normal fabric, and is regularly *maintained* by nutritive substitution; so that it may endure to the end of life, like the scar of a wound."

Dr. Carpenter's phrase that *our nervous system grows to the modes in which it has been exercised* expresses the philosophy of habit in a nutshell. We may now trace some of the practical applications of the principle to human life.

The first result of it is that *habit simplifies the movements required to achieve a given result, makes them more accurate and diminishes fatigue.*

"The beginner at the piano not only moves his finger up and down in order to depress the key, he moves the whole hand, the forearm and even the entire body, especially moving its least rigid part, the head, as if he would press down the key with that organ too. Often a contraction of the abdominal muscles occurs as well. Principally, however, the impulse is determined to the motion of the hand and of the single finger. This is, in the first place, because the movement of the finger is the movement *thought of* and, in the second place, because its movement and that of the key are the movements we try to *perceive*, along with the results of the latter on the ear. The more often the process is repeated, the more easily the movement follows, on account of the increase in permeability of the nerves engaged.

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"But the more easily the movement occurs, the slighter is the stimulus required to set it up; and the slighter the stimulus is, the more its effect is confined to the fingers alone.

"Thus, an impulse which originally spread its effects over the whole body, or at least over many of its movable parts, is gradually determined to a single definite organ, in which it effects the contraction of a few limited muscles. In this change the thoughts and perceptions which start the impulse acquire more and more intimate causal relations with a particular group of motor nerves.

"To recur to a simile, at least partially apt, imagine the nervous system to represent a drainage-system, inclining, on the whole, toward certain muscles, but with the escape thither somewhat clogged. Then streams of water will, on the whole, tend most to fill the drains that go towards these muscles and to wash out the escape. In case of a sudden 'flushing,' however, the whole system of channels will fill itself, and the water overflow everywhere before it escapes. But a moderate quantity of water invading the system will flow through the proper escape alone.

"Just so with the piano-player. As soon as his impulse, which has gradually learned to confine itself to single muscles, grows extreme, it overflows into larger muscular regions. He usually plays with his fingers, his body being at rest. But no sooner does he get excited than his whole body becomes 'animated,' and he moves his head and trunk, in particular, as if these also were organs with which he meant to belabor the keys."^[144]

Man is born with a tendency to do more things than he has ready-made arrangements for in his nerve-centres. Most of the performances of other animals are automatic. But in him the number of them is so enormous, that most of them must be the fruit of painful study. If practice did not make perfect, nor habit economize the expense of nervous and muscular energy, he would therefore be in a sorry plight. As Dr. Maudsley says:^[145]

"If an act became no easier after being done several times, if the careful direction of consciousness were necessary to its accomplishment on each occasion, it is evident that the whole activity of a lifetime might be confined to one or two deeds—that no progress could take place in development. A man might be occupied all day in dressing and undressing himself; the attitude of his body would absorb all his attention and energy; the washing of his hands or the fastening of a button would be as difficult to him on each occasion as to the child on its first trial; and he would, furthermore, be completely exhausted by his exertions. Think of the pains necessary to teach a child to stand, of the many efforts which it must make, and of the ease with which it at last stands, unconscious of any effort. For while secondarily automatic acts are accomplished with comparatively little weariness—in this regard approaching the organic movements, or the original reflex movements—the conscious effort of the will soon produces exhaustion. A spinal cord without ... memory would simply be an idiotic spinal cord.... It is impossible for an individual to realize how much he owes to its automatic agency until disease has impaired its functions."

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The next result is that *habit diminishes the conscious attention with which our acts are performed.*

One may state this abstractly thus: If an act require for its execution a chain, *A, B, C, D, E, F, G*, etc., of successive nervous events, then in the first performances of the action the conscious will must choose each of these events from a number of wrong alternatives that tend to present themselves; but habit soon brings it about that each event calls up its own appropriate successor without any alternative offering itself, and without any reference to the conscious will, until at last the whole chain, *A, B, C, D, E, F, G*, rattles itself off as soon as *A* occurs, just as if *A* and the rest of the chain were fused into a continuous stream. When we are learning to walk, to ride, to swim, skate, fence, write, play, or sing, we interrupt ourselves at every step by unnecessary movements and false notes. When we are proficient, on the contrary, the results not only follow with the very minimum of muscular action requisite to bring them forth, they also follow from a single instantaneous 'cue.' The marksman sees the bird, and, before he knows it, he has aimed and shot. A gleam in his adversary's eye, a momentary pressure from his rapier, and the fencer finds that he has instantly made the right parry and return. A glance at the musical hieroglyphics, and the pianist's fingers have rippled through a cataract of notes. And not only is it the right thing at the right time that we thus involuntarily do, but the wrong thing also, if it be an habitual thing. Who is there that has never wound up his watch on taking off his waistcoat in the daytime, or taken his latch-key out on arriving at the door-step of a friend? Very absent-minded persons in going to their bedroom to dress for dinner have been known to take off one garment after another and finally to get into bed, merely because that was the habitual issue of the first few movements when performed at a later hour. The writer well remembers how, on revisiting Paris after ten years' absence, and, finding himself in the street in which for one winter he had attended school, he lost himself in a brown study, from which he was awakened by finding himself upon the stairs which led to the apartment in a house many streets away in which he had lived during that earlier time, and to which his steps from the school had then habitually led. We all of us have a definite routine manner of performing certain daily offices connected with the toilet, with the opening and shutting of familiar cupboards, and the like. Our lower centres know the order of these movements, and show

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their knowledge by their 'surprise' if the objects are altered so as to oblige the movement to be made in a different way. But our higher thought-centres know hardly anything about the matter. Few men can tell off-hand which sock, shoe, or trousers-leg they put on first. They must first mentally rehearse the act; and even that is often insufficient—the act must be *performed*. So of the questions, Which valve of my double door opens first? Which way does my door swing? etc. I cannot *tell* the answer; yet my *hand* never makes a mistake. No one can *describe* the order in which he brushes his hair or teeth; yet it is likely that the order is a pretty fixed one in all of us.

These results may be expressed as follows:

In action grown habitual, what instigates each new muscular contraction to take place in its appointed order is not a thought or a perception, but the *sensation occasioned by the muscular contraction just finished*. A strictly voluntary act has to be guided by idea, perception, and volition, throughout its whole course. In an habitual action, mere sensation is a sufficient guide, and the upper regions of brain and mind are set comparatively free. A diagram will make the matter clear:

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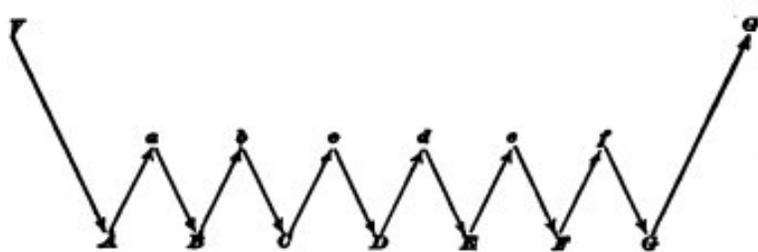


FIG. 24.

Let *A, B, C, D, E, F, G* represent an habitual chain of muscular contractions, and let *a, b, c, d, e, f* stand for the respective sensations which these contractions excite in us when they are successively performed. Such sensations will usually be of the muscles, skin, or joints of the parts moved, but they may also be effects of the movement upon the eye or the ear. Through them, and through them alone, we are made aware whether the contraction has or has not occurred. When the series, *A, B, C, D, E, F, G*, is being learned, each of these sensations becomes the object of a separate perception by the mind. By it we test each movement, to see if it be right before advancing to the next. We hesitate, compare, choose, revoke, reject, etc., by intellectual means; and the order by which the next movement is discharged is an express order from the ideational centres after this deliberation has been gone through.

In habitual action, on the contrary, the only impulse which the centres of idea or perception need send down is the initial impulse, the command to *start*. This is represented in the diagram by *V*; it may be a thought of the first movement or of the last result, or a mere perception of some of the habitual conditions of the chain, the presence, e.g., of the keyboard near the hand. In the present case, no sooner has the conscious thought or volition instigated movement *A*, than *A*, through the sensation *a* of its own occurrence, awakens *B* reflexly; *B* then excites *C* through *b*, and so on till the chain is ended, when the intellect generally takes cognizance of the final result. The process, in fact, resembles the passage of a wave of 'peristaltic' motion down the bowels. The intellectual perception at the end is indicated in the diagram by the effect of *G* being represented, at *G'*, in the ideational centres above the merely sensational line. The sensational impressions, *a, b, c, d, e, f*, are all supposed to have their seat below the ideational lines. That our ideational centres, if involved at all by *a, b, c, d, e, f*, are involved in a minimal degree, is shown by the fact that the attention may be wholly absorbed elsewhere. We may say our prayers, or repeat the alphabet, with our attention far away.

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"A musical performer will play a piece which has become familiar by repetition while carrying on an animated conversation, or while continuously engrossed

by some train of deeply interesting thought; the accustomed sequence of movements being directly prompted by the *sight* of the notes, or by the remembered succession of the *sounds* (if the piece is played from memory), aided in both cases by the guiding sensations derived from the muscles themselves. But, further, a higher degree of the same 'training' (acting on an organism specially fitted to profit by it) enables an accomplished pianist to play a difficult piece of music at sight; the movements of the hands and fingers following so immediately upon the sight of the notes that it seems impossible to believe that any but the very shortest and most direct track can be the channel of the nervous communication through which they are called forth. The following curious example of the same class of *acquired aptitudes*, which differ from instincts only in being prompted to action by the will, is furnished by Robert Houdin:

"With a view of cultivating the rapidity of visual and tactile perception, and the precision of respondent movements, which are necessary for success in every kind of prestidigitation, Houdin early practised the art of juggling with balls in the air; and having, after a month's practice, become thorough master of the art of keeping up *four* balls at once, he placed a book before him, and, while the balls were in the air, accustomed himself to read without hesitation. 'This,' he says, 'will probably seem to my readers very extraordinary; but I shall surprise them still more when I say that I have just amused myself with repeating this curious experiment. Though thirty years have elapsed since the time I was writing, and though I have scarcely once touched the balls during that period, I can still manage to read with ease while keeping *three* balls up.'" (Autobiography, p. 26.)^[146]

We have called *a, b, c, d, e, f*, the antecedents of the successive muscular attractions, by the name of sensations. Some authors seem to deny that they are even this. If not even this, they can only be centripetal nerve-currents, not sufficient to arouse feeling, but sufficient to arouse motor response.^[147] It may be at once admitted that they are not distinct *volitions*. The will, if any will be present, limits itself to a *permission* that they exert their motor effects. Dr. Carpenter writes:

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"There may still be metaphysicians who maintain that actions which were originally prompted by the will with a distinct intention, and which are still entirely under its control, can never cease to be volitional; and that either an infinitesimally small amount of will is required to sustain them when they have been once set going, or that the will is in a sort of pendulum-like oscillation between the two actions—the maintenance of the train of *thought*, and the maintenance of the train of *movement*. But if only an infinitesimally small amount of will is necessary to sustain them, is not this tantamount to saying that they go on by a force of their own? And does not the experience of the *perfect continuity* of our train of thought during the performance of movements that have become habitual, entirely negative the hypothesis of oscillation? Besides, if such an oscillation existed, there must be *intervals* in which each action goes on *of itself*; so that its essentially automatic character is virtually admitted. The physiological explanation, that the mechanism of locomotion, as of other habitual movements, *grows to* the mode in which it is early exercised, and that it then works automatically under the general control and direction of the will, can scarcely be put down by any assumption of an hypothetical necessity, which rests only on the basis of ignorance of one side of our composite nature."

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But if not distinct acts of will, these immediate antecedents of each movement of the chain are at any rate accompanied by consciousness of some kind. They are *sensations* to which we are *usually inattentive*, but which immediately call our attention if they go *wrong*. Schneider's account of these sensations deserves to be quoted. In the act of walking, he says, even when our attention is entirely off,

"we are continuously aware of certain muscular feelings; and we have, moreover, a feeling of certain impulses to keep our equilibrium and to set down one leg after another. It is doubtful whether we could preserve equilibrium if no sensation of our body's attitude were there, and doubtful whether we should advance our leg if we had no sensation of its movement as executed, and not even a minimal feeling of impulse to set it down. Knitting appears altogether mechanical, and the knitter keeps up her knitting even while she reads or is engaged in lively talk. But if we ask her how this be possible, she will hardly reply that the knitting goes on of itself. She will rather say that she has a feeling of it, that she feels in her hands that she knits and how she must knit, and that therefore the movements of knitting are called forth and regulated by the sensations associated therewithal, even when the attention is called away.

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"So of every one who practises, apparently automatically, a long-familiar handicraft. The smith turning his tongs as he smites the iron, the carpenter wielding his plane, the lace-maker with her bobbin, the weaver at his loom, all will answer the same question in the same way by saying that they have a feeling of the proper management of the implement in their hands.

"In these cases, the feelings which are conditions of the appropriate acts are very faint. But none the less are they necessary. Imagine your hands not feeling; your movements could then only be provoked by ideas, and if your ideas were then diverted away, the movements ought to come to a standstill, which is a consequence that seldom occurs."^[149]

Again:

"An idea makes you take, for example, a violin into your left hand. But it is not necessary that your idea remain fixed on the contraction of the muscles of the left hand and fingers in order that the violin may continue to be held fast and not let fall. The sensations themselves which the holding of the instrument awakens in the hand, since they are associated with the motor impulse of grasping, are sufficient to cause this impulse, which then lasts as long as the feeling itself lasts, or until the impulse is inhibited by the idea of some antagonistic motion."

And the same may be said of the manner in which the right hand holds the bow:

"It sometimes happens, in beginning these simultaneous combinations, that one movement or impulse will cease if the consciousness turn particularly toward another, because at the outset the guiding sensations must *all* be strongly *felt*. The bow will perhaps slip from the fingers, because some of the muscles have relaxed. But the slipping is a cause of new sensations starting up in the hand, so that the attention is in a moment brought back to the grasping of the bow.

"The following experiment shows this well: When one begins to play on the violin, to keep him from raising his right elbow in playing a book is placed under his right armpit, which he is ordered to hold fast by keeping the upper arm tight against his body. The muscular feelings, and feelings of contact connected with the book, provoke an impulse to press it tight. But often it

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happens that the beginner, whose attention gets absorbed in the production of the notes, lets drop the book. Later, however, this never happens; the faintest sensations of contact suffice to awaken the impulse to keep it in its place, and the attention may be wholly absorbed by the notes and the fingering with the left hand. *The simultaneous combination of movements is thus in the first instance conditioned by the facility with which in us, alongside of intellectual processes, processes of inattentive feeling may still go on.*"^[150]

This brings us by a very natural transition to the *ethical implications of the law of habit*. They are numerous and momentous. Dr. Carpenter, from whose 'Mental Physiology' we have quoted, has so prominently enforced the principle that our organs grow to the way in which they have been exercised, and dwelt upon its consequences, that his book almost deserves to be called a work of edification, on this account alone. We need make no apology, then, for tracing a few of these consequences ourselves:

"Habit a second nature! Habit is ten times nature," the Duke of Wellington is said to have exclaimed; and the degree to which this is true no one can probably appreciate as well as one who is a veteran soldier himself. The daily drill and the years of discipline end by fashioning a man completely over again, as to most of the possibilities of his conduct.

"There is a story, which is credible enough, though it may not be true, of a practical joker, who, seeing a discharged veteran carrying home his dinner, suddenly called out, 'Attention!' whereupon the man instantly brought his hands down, and lost his mutton and potatoes in the gutter. The drill had been thorough, and its effects had become embodied in the man's nervous structure."
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Riderless cavalry-horses, at many a battle, have been seen to come together and go through their customary evolutions at the sound of the bugle-call. Most trained domestic animals, dogs and oxen, and omnibus- and car-horses, seem to be machines almost pure and simple, undoubtingly, unhesitatingly doing from minute to minute the duties they have been taught, and giving no sign that the possibility of an alternative ever suggests itself to their mind. Men grown old in prison have asked to be readmitted after being once set free. In a railroad accident to a travelling menagerie in the United States some time in 1881, a tiger, whose cage had broken open, is said to have emerged, but presently crept back again, as if too much bewildered by his new responsibilities, so that he was without difficulty secured.

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Habit is thus the enormous fly-wheel of society, its most precious conservative agent. It alone is what keeps us all within the bounds of ordinance, and saves the children of fortune from the envious uprisings of the poor. It alone prevents the hardest and most repulsive walks of life from being deserted by those brought up to tread therein. It keeps the fisherman and the deck-hand at sea through the winter; it holds the miner in his darkness, and nails the countryman to his log-cabin and his lonely farm through all the months of snow; it protects us from invasion by the natives of the desert and the frozen zone. It dooms us all to fight out the battle of life upon the lines of our nurture or our early choice, and to make the best of a pursuit that disagrees, because there is no other for which we are fitted, and it is too late to begin again. It keeps different social strata from mixing. Already at the age of twenty-five you see the professional mannerism settling down on the young commercial traveller, on the young doctor, on the young minister, on the young counsellor-at-law. You see the little lines of cleavage running through the character, the tricks of thought, the prejudices, the ways of the 'shop,' in a word, from which the man can by-and-by no more escape than his coat-sleeve can suddenly fall into a new set of folds. On the whole, it is best he should not escape. It is well for the world that in most of us, by the age of thirty, the character has set like plaster, and will never soften again.

If the period between twenty and thirty is the critical one in the formation of intellectual and professional habits, the period below twenty is more important still for the fixing of *personal* habits, properly so called, such as vocalization and pronunciation, gesture, motion, and address. Hardly ever is a language learned after twenty spoken without a foreign accent; hardly ever can a youth transferred to the society of his betters unlearn the nasality and other vices of speech bred in him by the associations of his growing years. Hardly ever, indeed, no matter how much money there be in his pocket, can he even learn to *dress* like a gentleman-born. The merchants offer their wares as eagerly to him as to the veriest 'swell,' but he simply *cannot* buy the right things. An invisible law, as strong as gravitation, keeps him within his orbit, arrayed this year as he was the last; and how his better-bred acquaintances contrive to get the things they wear will be for him a mystery till his dying day.

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The great thing, then, in all education, is to *make our nervous system our ally instead of our enemy*. It is to fund and capitalize our acquisitions, and live at ease upon the interest of the fund. *For this we must make automatic and habitual, as early as possible, as many useful actions as we can*, and guard against the growing into ways that are likely to be disadvantageous to us, as we should guard against the plague. The more of the details of our daily life we can hand over to the effortless custody of automatism, the more our higher powers of mind will be set free for their own proper work. There is no more miserable human being than one in whom nothing is habitual but indecision, and for whom the lighting of every cigar, the drinking of every cup, the time of rising and going to bed every day, and the beginning of every bit of work, are subjects of express volitional deliberation. Full half the time of such a man goes to the deciding, or regretting, of matters which ought to be so ingrained in him as practically not to exist for his consciousness at all. If there be such daily duties not yet ingrained in any one of my readers, let him begin this very hour to set the matter right.

In Professor Bain's chapter on 'The Moral Habits' there are some admirable practical remarks laid down. Two great maxims emerge from his treatment. The first is that in the acquisition of a new habit, or the leaving off of an old one, we must take care to *launch ourselves with as strong and decided an initiative as possible*. Accumulate all the possible circumstances which shall re-enforce the right motives; put yourself assiduously in conditions that encourage the new way; make engagements incompatible with the old; take a public pledge, if the case allows; in short, envelop your resolution with every aid you know. This will give your new beginning such a momentum that the temptation to break down will not occur as soon as it otherwise might; and every day during which a breakdown is postponed adds to the chances of its not occurring at all.

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The second maxim is: *Never suffer an exception to occur till the new habit is securely rooted in your life*. Each lapse is like the letting fall of a ball of string which one is carefully winding up; a single slip undoes more than a great many turns will wind again. *Continuity* of training is the great means of making the nervous system act infallibly right. As Professor Bain says:

"The peculiarity of the moral habits, contradistinguishing them from the intellectual acquisitions, is the presence of two hostile powers, one to be gradually raised into the ascendant over the other. It is necessary, above all things, in such a situation, never to lose a battle. Every gain on the wrong side undoes the effect of many conquests on the right. The essential precaution, therefore, is so to regulate the two opposing powers that the one may have a series of uninterrupted successes, until repetition has fortified it to such a degree as to enable it to cope with the opposition, under any circumstances. This is the theoretically best career of mental progress."

The need of securing success at the *outset* is imperative. Failure at first is apt to dampen the energy of all future attempts, whereas past experience of success nerves one to future vigor.

Goethe says to a man who consulted him about an enterprise but mistrusted his own powers: "Ach! you need only blow on your hands!" And the remark illustrates the effect on Goethe's spirits of his own habitually successful career. Prof. Baumann, from whom I borrow the anecdote,^[152] says that the collapse of barbarian nations when Europeans come among them is due to their despair of ever succeeding as the new-comers do in the larger tasks of life. Old ways are broken and new ones not formed.

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The question of 'tapering-off,' in abandoning such habits as drink and opium-indulgence, comes in here, and is a question about which experts differ within certain limits, and in regard to what may be best for an individual case. In the main, however, all expert opinion would agree that abrupt acquisition of the new habit is the best way, *if there be a real possibility of carrying it out*. We must be careful not to give the will so stiff a task as to insure its defeat at the very outset; but, *provided one can stand it*, a sharp period of suffering, and then a free time, is the best thing to aim at, whether in giving up a habit like that of opium, or in simply changing one's hours of rising or of work. It is surprising how soon a desire will die of inanition if it be *never* fed.

"One must first learn, unmoved, looking neither to the right nor left, to walk firmly on the straight and narrow path, before one can begin 'to make one's self over again.' He who every day makes a fresh resolve is like one who, arriving at the edge of the ditch he is to leap, forever stops and returns for a fresh run. Without *unbroken* advance there is no such thing as *accumulation* of the ethical forces possible, and to make this possible, and to exercise us and habituate us in it, is the sovereign blessing of regular *work*."^[153]

A third maxim may be added to the preceding pair: *Seize the very first possible opportunity to act on every resolution you make, and on every emotional prompting you may experience in the direction of the habits you aspire to gain*. It is not in the moment of their forming, but in the moment of their producing *motor effects*, that resolves and aspirations communicate the new 'set' to the brain. As the author last quoted remarks:

"The actual presence of the practical opportunity alone furnishes the fulcrum upon which the lever can rest, by means of which the moral will may multiply its strength, and raise itself aloft. He who has no solid ground to press against will never get beyond the stage of empty gesture-making."

No matter how full a reservoir of *maxims* one may possess, and no matter how good one's *sentiments* may be, if one have not taken advantage of every concrete opportunity to *act*, one's character may remain entirely unaffected for the better. With mere good intentions, hell is proverbially paved. And this is an obvious consequence of the principles we have laid down. A 'character,' as J. S. Mill says, 'is a completely fashioned will'; and a will, in the sense in which he means it, is an aggregate of tendencies to act in a firm and prompt and definite way upon all the principal emergencies of life. A tendency to act only becomes effectively ingrained in us in proportion to the uninterrupted frequency with which the actions actually occur, and the brain 'grows' to their use. Every time a resolve or a fine glow of feeling evaporates without bearing practical fruit is worse than a chance lost; it works so as positively to hinder future resolutions and emotions from taking the normal path of discharge. There is no more contemptible type of human character than that of the nerveless sentimentalist and dreamer, who spends his life in a weltering sea of sensibility and emotion, but who never does a manly concrete deed. Rousseau, inflaming all the mothers of France, by his eloquence, to follow Nature and nurse their babies themselves, while he sends his own children to the foundling hospital, is the classical example of what I mean. But every one of us in his measure, whenever, after glowing for an abstractly formulated Good, he practically ignores some actual case, among the squalid 'other particulars' of which that same Good lurks disguised, treads straight on Rousseau's path. All Goods are disguised

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by the vulgarity of their concomitants, in this work-a-day world; but woe to him who can only recognize them when he thinks them in their pure and abstract form! The habit of excessive novel-reading and theatre-going will produce true monsters in this line. The weeping of a Russian lady over the fictitious personages in the play, while her coachman is freezing to death on his seat outside, is the sort of thing that everywhere happens on a less glaring scale. Even the habit of excessive indulgence in music, for those who are neither performers themselves nor musically gifted enough to take it in a purely intellectual way, has probably a relaxing effect upon the character. One becomes filled with emotions which habitually pass without prompting to any deed, and so the inertly sentimental condition is kept up. The remedy would be, never to suffer one's self to have an emotion at a concert, without expressing it afterward in *some* active way.^[154] Let the expression be the least thing in the world—speaking genially to one's aunt, or giving up one's seat in a horse-car, if nothing more heroic offers—but let it not fail to take place.

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These latter cases make us aware that it is not simply *particular lines* of discharge, but also *general forms* of discharge, that seem to be grooved out by habit in the brain. Just as, if we let our emotions evaporate, they get into a way of evaporating; so there is reason to suppose that if we often flinch from making an effort, before we know it the effort-making capacity will be gone; and that, if we suffer the wandering of our attention, presently it will wander all the time. Attention and effort are, as we shall see later, but two names for the same psychic fact. To what brain-processes they correspond we do not know. The strongest reason for believing that they do depend on brain-processes at all, and are not pure acts of the spirit, is just this fact, that they seem in some degree subject to the law of habit, which is a material law. As a final practical maxim, relative to these habits of the will, we may, then, offer something like this: *Keep the faculty of effort alive in you by a little gratuitous exercise every day.* That is, be systematically ascetic or heroic in little unnecessary points, do every day or two something for no other reason than that you would rather not do it, so that when the hour of dire need draws nigh, it may find you not unnerved and untrained to stand the test. Asceticism of this sort is like the insurance which a man pays on his house and goods. The tax does him no good at the time, and possibly may never bring him a return. But if the fire *does* come, his having paid it will be his salvation from ruin. So with the man who has daily inured himself to habits of concentrated attention, energetic volition, and self-denial in unnecessary things. He will stand like a tower when everything rocks around him, and when his softer fellow-mortals are winnowed like chaff in the blast.

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The physiological study of mental conditions is thus the most powerful ally of hortatory ethics. The hell to be endured hereafter, of which theology tells, is no worse than the hell we make for ourselves in this world by habitually fashioning our characters in the wrong way. Could the young but realize how soon they will become mere walking bundles of habits, they would give more heed to their conduct while in the plastic state. We are spinning our own fates, good or evil, and never to be undone. Every smallest stroke of virtue or of vice leaves its never so little scar. The drunken Rip Van Winkle, in Jefferson's play, excuses himself for every fresh dereliction by saying, 'I won't count this time!' Well! he may not count it, and a kind Heaven may not count it; but it is being counted none the less. Down among his nerve-cells and fibres the molecules are counting it, registering and storing it up to be used against him when the next temptation comes. Nothing we ever do is, in strict scientific literalness, wiped out. Of course, this has its good side as well as its bad one. As we become permanent drunkards by so many separate drinks, so we become saints in the moral, and authorities and experts in the practical and scientific spheres, by so many separate acts and hours of work. Let no youth have any anxiety about the upshot of his education, whatever the line of it may be. If he keep faithfully busy each hour of the working-day, he may safely leave the final result to itself. He can with perfect certainty count on waking up some fine morning, to find himself one of the competent ones of his generation, in whatever pursuit he may have singled out. Silently, between all the details of his business, the *power of judging* in all that class of matter will have built itself up within

him as a possession that will never pass away. Young people should know this truth in advance. The ignorance of it has probably engendered more discouragement and faint-heartedness in youths embarking on arduous careers than all other causes put together.

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- [136] This chapter has already appeared in the *Popular Science Monthly* for February 1887.
- [137] In the sense above explained, which applies to inner structure as well as to outer form.
- [138] *Revue Philosophique*, i, 324.
- [139] Some paths, to be sure, are banked up by bodies moving through them under too great pressure, and made impervious. These special cases we disregard.
- [140] We cannot say *the will*, for, though many, perhaps most, human habits were once voluntary actions, no action, as we shall see in a later chapter, can be *primarily* such. While an habitual action may once have been voluntary, the voluntary action must before that, at least once, have been impulsive or reflex. It is this very first occurrence of all that we consider in the text.
- [141] Those who desire a more definite formulation may consult J. Fiske's 'Cosmic Philosophy,' vol. ii, pp. 142-146 and Spencer's 'Principles of Biology,' sections 302 and 303, and the part entitled 'Physical Synthesis' of his 'Principles of Psychology.' Mr. Spencer there tries, not only to show how new actions may arise in nervous systems and form new reflex arcs therein, but even how nervous tissue may actually be born by the passage of new waves of isometric transformation through an originally indifferent mass. I cannot help thinking that Mr. Spencer's data, under a great show of precision, conceal vagueness and improbability, and even self-contradiction.
- [142] 'Mental Physiology' (1874) pp. 339-345.
- [143] [See, later, Masius in Van Benedens' and Van Bambeke's 'Archives de Biologie,' vol. i (Liège, 1880).—W. J.]
- [144] G. H. Schneider: 'Der menschliche Wille' (1882), pp. 417-419 (freely translated). For the drain-simile, see also Spencer's 'Psychology,' part v, chap. viii.
- [145] *Physiology of Mind*, p. 155.
- [146] Carpenter's 'Mental Physiology' (1874), pp. 217, 218.
- [147] Von Hartmann devotes a chapter of his 'Philosophy of the Unconscious' (English translation, vol. i, p. 72) to proving that they must be both *ideas* and *unconscious*.
- [148] 'Mental Physiology,' p. 20.
- [149] 'Der menschliche Wille,' pp. 447, 448.
- [150] 'Der menschliche Wille,' p. 439. The last sentence is rather freely translated—the sense is unaltered.
- [151] Huxley's 'Elementary Lessons in Physiology,' lesson xii.
- [152] See the admirable passage about success at the outset, in his *Handbuch der Moral* (1878), pp. 38-43.
- [153] J. Bahnsen: 'Beiträge zu Charakterologie' (1867), vol i, p. 209.
- [154] See for remarks on this subject a readable article by Miss V. Scudder on 'Musical Devotees and Morals,' in the *Andover Review* for January. 1887.
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THE AUTOMATON-THEORY.

In describing the functions of the hemispheres a short way back, we used language derived from both the bodily and the mental life, saying now that the animal made indeterminate and unforeseeable reactions, and anon that he was swayed by considerations of future good and evil; treating his hemispheres sometimes as the seat of memory and ideas in the psychic sense, and sometimes talking of them as simply a complicated addition to his reflex machinery. This sort of vacillation in the point of view is a fatal incident of all ordinary talk about these questions; but I must now settle my scores with those readers to whom I already dropped a word in passing (see [Footnote 6](#)) and who have probably been dissatisfied with my conduct ever since.

Suppose we restrict our view to facts of one and the same plane, and let that be the bodily plane: cannot all the outward phenomena of intelligence still be exhaustively described? Those mental images, those 'considerations,' whereof we spoke,—presumably they do not arise without neural processes arising simultaneously with them, and presumably each consideration corresponds to a process *sui generis*, and unlike all the rest. In other words, however numerous and delicately differentiated the train of ideas may be, the train of brain-events that runs alongside of it must in both respects be exactly its match, and we must postulate a neural machinery that offers a living counterpart for every shading, however fine, of the history of its owner's mind. Whatever degree of complication the latter may reach, the complication of the machinery must be quite as extreme, otherwise we should have to admit that there may be mental events to which no brain-events correspond. But such an admission as this the physiologist is reluctant to make. It would violate all his beliefs. 'No psychosis without neurosis,' is one form which the principle of continuity takes in his mind.

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But this principle forces the physiologist to make still another step. If neural action is as complicated as mind; and if in the sympathetic system and lower spinal cord we see what, so far as we know, is unconscious neural action executing deeds that to all outward intent may be called intelligent; what is there to hinder us from supposing that even where we know consciousness to be there, the still more complicated neural action which we believe to be its inseparable companion is alone and of itself the real agent of whatever intelligent deeds may appear? "As actions of a certain degree of complexity are brought about by mere mechanism, why may not actions of a still greater degree of complexity be the result of a more refined mechanism?" The conception of reflex action is surely one of the best conquests of physiological theory; why not be radical with it? Why not say that just as the spinal cord is a machine with few reflexes, so the hemispheres are a machine with many, and that that is all the difference? The principle of continuity would press us to accept this view.

But what on this view could be the function of the consciousness itself? *Mechanical* function it would have none. The sense-organs would awaken the brain-cells; these would awaken each other in rational and orderly sequence, until the time for action came; and then the last brain-vibration would discharge downward into the motor tracts. But this would be a quite autonomous chain of occurrences, and whatever mind went with it would be there only as an 'epiphenomenon,' an inert spectator, a sort of 'foam, aura, or melody' as Mr. Hodgson says, whose opposition or whose furtherance would be alike powerless over the occurrences themselves. When talking, some time ago, we ought not, accordingly, *as physiologists*, to have said anything about 'considerations' as guiding the animal. We ought to have said 'paths left in the hemispherical cortex by former currents,' and nothing more.

Now so simple and attractive is this conception from the consistently physiological point of view, that it is quite wonderful to see how late it was stumbled on in philosophy, and how few people, even when it has been explained to them, fully and easily realize its import.

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Much of the polemic writing against it is by men who have as yet failed to take it into their imaginations. Since this has been the case, it seems worth while to devote a few more words to making it plausible, before criticising it ourselves.

To Descartes belongs the credit of having first been bold enough to conceive of a completely self-sufficing nervous mechanism which should be able to perform complicated and apparently intelligent acts. By a singularly arbitrary restriction, however, Descartes stopped short at man, and while contending that in beasts the nervous machinery was all, he held that the higher acts of man were the result of the agency of his rational soul. The opinion that beasts have no consciousness at all was of course too paradoxical to maintain itself long as anything more than a curious item in the history of philosophy. And with its abandonment the very notion that the nervous system *per se* might work the work of intelligence, which was an integral, though detachable part of the whole theory, seemed also to slip out of men's conception, until, in this century, the elaboration of the doctrine of reflex action made it possible and natural that it should again arise. But it was not till 1870, I believe, that Mr. Hodgson made the decisive step, by saying that feelings, no matter how intensely they may be present, can have no causal efficacy whatever, and comparing them to the colors laid on the surface of a mosaic, of which the events in the nervous system are represented by the stones.^[155] Obviously the stones are held in place by each other and not by the several colors which they support.

About the same time Mr. Spalding, and a little later Messrs. Huxley and Clifford, gave great publicity to an identical doctrine, though in their case it was backed by less refined metaphysical considerations.^[156]

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A few sentences from Huxley and Clifford may be subjoined to make the matter entirely clear. Professor Huxley says:

"The consciousness of brutes would appear to be related to the mechanism of their body simply as a collateral product of its working, and to be as completely without any power of modifying that working as the steam-whistle which accompanies the work of a locomotive engine is without influence on its machinery. Their volition, if they have any, is an emotion *indicative* of physical changes, not a *cause* of such changes.... The soul stands related to the body as the bell of a clock to the works, and consciousness answers to the sound which the bell gives out when it is struck.... Thus far I have strictly confined myself to the automatism of brutes.... It is quite true that, to the best of my judgment, the argumentation which applies to brutes holds equally good of men; and, therefore, that all states of consciousness in us, as in them, are immediately caused by molecular changes of the brain-substance. It seems to me that in men, as in brutes, there is no proof that any state of consciousness is the cause of change in the motion of the matter of the organism. If these positions are well based, it follows that our mental conditions are simply the symbols in consciousness of the changes which take place automatically in the organism; and that, to take an extreme illustration, the feeling we call volition is not the cause of a voluntary act, but the symbol of that state of the brain which is the immediate cause of that act. We are conscious automata."

Professor Clifford writes:

"All the evidence that we have goes to show that the physical world gets along entirely by itself, according to practically universal rules.... The train of physical facts between the stimulus sent into the eye, or to any one of our senses, and the exertion which follows it, and the train of physical facts which goes on in the brain, even when there is no stimulus and no exertion,—these are perfectly complete physical trams, and every step is fully accounted for by

mechanical conditions.... The two things are on utterly different platforms—the physical facts go along by themselves, and the mental facts go along by themselves. There is a parallelism between them, but there is no interference of one with the other. Again, if anybody says that the will influences matter, the statement is not untrue, but it is nonsense. Such an assertion belongs to the crude materialism of the savage. The only thing which influences matter is the position of surrounding matter or the motion of surrounding matter.... The assertion that another man's volition, a feeling in his consciousness that I cannot perceive, is part of the train of physical facts which I may perceive,—this is neither true nor untrue, but nonsense; it is a combination of words whose corresponding ideas will not go together.... Sometimes one series is known better, and sometimes the other; so that in telling a story we speak sometimes of mental and sometimes of material facts. A feeling of chill made a man run; strictly speaking, the nervous disturbance which coexisted with that feeling of chill made him run, if we want to talk about material facts; or the feeling of chill produced the form of sub-consciousness which coexists with the motion of legs, if we want to talk about mental facts.... When, therefore, we ask: 'What is the physical link between the ingoing message from chilled skin and the outgoing message which moves the leg?' and the answer is, 'A man's will,' we have as much right to be amused as if we had asked our friend with the picture what pigment was used in painting the cannon in the foreground, and received the answer, 'Wrought iron.' It will be found excellent practice in the mental operations required by this doctrine to imagine a train, the fore part of which is an engine and three carriages linked with iron couplings, and the hind part three other carriages linked with iron couplings; the bond between the two parts being made up out of the sentiments of amity subsisting between the stoker and the guard."

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To comprehend completely the consequences of the dogma so confidently enunciated, one should unflinchingly apply it to the most complicated examples. The movements of our tongues and pens, the flashings of our eyes in conversation, are of course events of a material order, and as such their causal antecedents must be exclusively material. If we knew thoroughly the nervous system of Shakespeare, and as thoroughly all his environing conditions, we should be able to show why at a certain period of his life his hand came to trace on certain sheets of paper those crabbed little black marks which we for shortness' sake call the manuscript of Hamlet. We should understand the rationale of every erasure and alteration therein, and we should understand all this without in the slightest degree acknowledging the existence of the thoughts in Shakespeare's mind. The words and sentences would be taken, not as signs of anything beyond themselves, but as little outward facts, pure and simple. In like manner we might exhaustively write the biography of those two hundred pounds, more or less, of warmish albuminoid matter called Martin Luther, without ever implying that it felt.

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But, on the other hand, nothing in all this could prevent us from giving an equally complete account of either Luther's or Shakespeare's spiritual history, an account in which every gleam of thought and emotion should find its place. The mind-history would run alongside of the body-history of each man, and each point in the one would correspond to, but not react upon, a point in the other. So the melody floats from the harp-string, but neither checks nor quickens its vibrations; so the shadow runs alongside the pedestrian, but in no way influences his steps.

Another inference, apparently more paradoxical still, needs to be made, though, as far as I am aware, Dr. Hodgson is the only writer who has explicitly drawn it. That inference is that feelings, not causing nerve-actions, cannot even cause each other. To ordinary common sense, felt pain is, as such, not only the cause of outward tears and cries, but also the cause

of such inward events as sorrow, compunction, desire, or inventive thought. So the consciousness of good news is the direct producer of the feeling of joy, the awareness of premises that of the belief in conclusions. But according to the automaton-theory, each of the feelings mentioned is only the correlate of some nerve-movement whose *cause* lay wholly in a previous nerve-movement. The first nerve-movement called up the second; whatever feeling was attached to the second consequently found itself following upon the feeling that was attached to the first. If, for example, good news was the consciousness correlated with the first movement, then joy turned out to be the correlate in consciousness of the second. But all the while the items of the nerve series were the only ones in causal continuity; the items of the conscious series, however inwardly rational their sequence, were simply juxtaposed.

REASONS FOR THE THEORY.

The 'conscious automaton-theory,' as this conception is generally called, is thus a radical and simple conception of the manner in which certain facts may possibly occur. But between conception and belief, proof ought to lie. And when we ask, 'What proves that all this is more than a mere conception of the possible?' it is not easy to get a sufficient reply. If we start from the frog's spinal cord and reason by continuity, saying, as that acts so intelligently, *though unconscious*, so the higher centres, *though conscious*, may have the intelligence they show quite as mechanically based; we are immediately met by the exact counter-argument from continuity, an argument actually urged by such writers as Pflüger and Lewes, which starts from the acts of the hemispheres, and says: "As *these* owe *their* intelligence to the consciousness which we know to be there, so the intelligence of the spinal cord's acts must really be due to the invisible presence of a consciousness lower in degree." All arguments from continuity work in two ways: you can either level up or level down by their means. And it is clear that such arguments as these can eat each other up to all eternity.

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There remains a sort of philosophic faith, bred like most faiths from an æsthetic demand. Mental and physical events are, on all hands, admitted to present the strongest contrast in the entire field of being. The chasm which yawns between them is less easily bridged over by the mind than any interval we know. Why, then, not call it an absolute chasm, and say not only that the two worlds are different, but that they are independent? This gives us the comfort of all simple and absolute formulas, and it makes each chain homogeneous to our consideration. When talking of nervous tremors and bodily actions, we may feel secure against intrusion from an irrelevant mental world. When, on the other hand, we speak of feelings, we may with equal consistency use terms always of one denomination, and never be annoyed by what Aristotle calls 'slipping into another kind.' The desire on the part of men educated in laboratories not to have their physical reasonings mixed up with such incommensurable factors as feelings is certainly very strong. I have heard a most intelligent biologist say: "It is high time for scientific men to protest against the recognition of any such thing as consciousness in a scientific investigation." In a word, feeling constitutes the 'unscientific' half of existence, and any one who enjoys calling himself a 'scientist' will be too happy to purchase an untrammelled homogeneity of terms in the studies of his predilection, at the slight cost of admitting a dualism which, in the same breath that it allows to mind an independent status of being, banishes it to a limbo of causal inertness, from whence no intrusion or interruption on its part need ever be feared.

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Over and above this great postulate that matters must be kept simple, there is, it must be confessed, still another highly abstract reason for denying causal efficacy to our feelings. We can form no positive image of the *modus operandi* of a volition or other thought affecting the cerebral molecules.

"Let us try to imagine an idea, say of food, producing a movement, say of carrying food to the mouth.... What is the method of its action? Does it assist

the decomposition of the molecules of the gray matter, or does it retard the process, or does it alter the direction in which the shocks are distributed? Let us imagine the molecules of the gray matter combined in such a way that they will fall into simpler combinations on the impact of an incident force. Now suppose the incident force, in the shape of a shock from some other centre, to impinge upon these molecules. By hypothesis it will decompose them, and they will fall into the simpler combination. How is the idea of food to prevent this decomposition? Manifestly it can do so only by increasing; the force which binds the molecules together. Good! Try to imagine the idea of a beefsteak binding two molecules together. It is impossible. Equally impossible is it to imagine a similar idea loosening the attractive force between two molecules."
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This passage from an exceedingly clever writer expresses admirably the difficulty to which I allude. Combined with a strong sense of the 'chasm' between the two worlds, and with a lively faith in reflex machinery, the sense of this difficulty can hardly fail to make one turn consciousness out of the door as a superfluity so far as one's explanations go. One may bow her out politely, allow her to remain as an 'epiphenomenon' (invaluable word!), but one insists that matter shall hold all the power.

"Having thoroughly recognized the fathomless abyss that separates mind from matter, and having so blended the very notion into his very nature that there is no chance of his ever forgetting it or failing to saturate with it all his meditations, the student of psychology has next to appreciate the association between these two orders of phenomena.... They are associated in a manner so intimate that some of the greatest thinkers consider them different aspects of the same process.... When the rearrangement of molecules takes place in the higher regions of the brain, a change of consciousness simultaneously occurs.... The change of consciousness never takes place without the change in the brain; the change in the brain never ... without the change in consciousness. But *why* the two occur together, or what the link is which connects them, we do not know, and most authorities believe that we never shall and never can know. Having firmly and tenaciously grasped these two notions, of the absolute separateness of mind and matter, and of the invariable concomitance of a mental change with a bodily change, the student will enter on the study of psychology with half his difficulties surmounted."
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Half his difficulties ignored, I should prefer to say. For this 'concomitance' in the midst of 'absolute separateness' is an utterly irrational notion. It is to my mind quite inconceivable that consciousness should have *nothing to do* with a business which it so faithfully attends. And the question, 'What has it to do?' is one which psychology has no right to 'surmount,' for it is her plain duty to consider it. The fact is that the whole question of interaction and influence between things is a metaphysical question, and cannot be discussed at all by those who are unwilling to go into matters thoroughly. It is truly enough hard to imagine the 'idea of a beefsteak binding two molecules together;' but since Hume's time it has been equally hard to imagine *anything* binding them together. The whole notion of 'binding' is a mystery, the first step towards the solution of which is to clear scholastic rubbish out of the way. Popular science talks of 'forces,' 'attractions' or 'affinities' as binding the molecules; but clear science, though she may use such words to abbreviate discourse, has no use for the conceptions, and is satisfied when she can express in simple 'laws' the bare space-relations of the molecules as functions of each other and of time. To the more curiously inquiring mind, however, this simplified expression of the bare facts is not enough; there must be a 'reason' for them, and something must 'determine' the laws. And when one seriously sits down to consider what sort of a thing one *means* when one asks for a 'reason,' one is led so

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far afield, so far away from popular science and its scholasticism, as to see that even such a fact as the existence or non-existence in the universe of 'the idea of a beefsteak' may not be wholly indifferent to other facts in the same universe, and in particular may have something to do with determining the distance at which two molecules in that universe shall lie apart. If this is so, then common-sense, though the intimate nature of causality and of the connection of things in the universe lies beyond her pitifully bounded horizon, has the root and gist of the truth in her hands when she obstinately holds to it that feelings and ideas are causes. However inadequate our ideas of causal efficacy may be, we are less wide of the mark when we say that our ideas and feelings have it, than the Automatists are when they say they haven't it. As in the night all cats are gray, so in the darkness of metaphysical criticism all causes are obscure. But one has no right to pull the pall over the psychic half of the subject only, as the automatists do, and to say that *that* causation is unintelligible, whilst in the same breath one dogmatizes about *material* causation as if Hume, Kant, and Lotze had never been born. One cannot thus blow hot and cold. One must be impartially *naif* or impartially critical. If the latter, the reconstruction must be thorough-going or 'metaphysical,' and will probably preserve the common-sense view that ideas are forces, in some translated form. But Psychology is a mere natural science, accepting certain terms uncritically as her data, and stopping short of metaphysical reconstruction. Like physics, she must be *naive*; and if she finds that in her very peculiar field of study ideas *seem* to be causes, she had better continue to talk of them as such. She gains absolutely nothing by a breach with common-sense in this matter, and she loses, to say the least, all naturalness of speech. If feelings are causes, of course their effects must be furtherances and checkings of internal cerebral motions, of which in themselves we are entirely without knowledge. It is probable that for years to come we shall have to infer what happens in the brain either from our feelings or from motor effects which we observe. The organ will be for us a sort of vat in which feelings and motions somehow go on stewing together, and in which innumerable things happen of which we catch but the statistical result. Why, under these circumstances, we should be asked to forswear the language of our childhood I cannot well imagine, especially as it is perfectly compatible with the language of physiology. The feelings can produce nothing absolutely new, they can only reinforce and inhibit reflex currents which already exist, and the original organization of these by physiological forces must always be the ground-work of the psychological scheme.

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My conclusion is that to urge the automaton-theory upon us, as it is now urged, on purely *a priori* and *quasi*-metaphysical grounds, is an *unwarrantable impertinence in the present state of psychology*.

REASONS AGAINST THE THEORY.

But there are much more positive reasons than this why we ought to continue to talk in psychology as if consciousness had causal efficacy. The *particulars of the distribution of consciousness*, so far as we know them, *point to its being efficacious*. Let us trace some of them.

It is very generally admitted, though the point would be hard to prove, that consciousness grows the more complex and intense the higher we rise in the animal kingdom. That of a man must exceed that of an oyster. From this point of view it seems an organ, superadded to the other organs which maintain the animal in the struggle for existence; and the presumption of course is that it helps him in some way in the struggle, just as they do. But it cannot help him without being in some way efficacious and influencing the course of his bodily history. If now it could be shown in what way consciousness *might* help him, and if, moreover, the defects of his other organs (where consciousness is most developed) are such as to make them need just the kind of help that consciousness would bring provided it *were* efficacious; why, then the plausible inference would be that it came just *because* of its efficacy—in other words, its efficacy would be inductively proved.

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Now the study of the phenomena of consciousness which we shall make throughout the rest of this book will show us that consciousness is at all times primarily *a selecting agency*.^[159] Whether we take it in the lowest sphere of sense, or in the highest of intellection, we find it always doing one thing, choosing one out of several of the materials so presented to its notice, emphasizing and accentuating that and suppressing as far as possible all the rest. The item emphasized is always in close connection with some *interest* felt by consciousness to be paramount at the time.

But what are now the defects of the nervous system in those animals whose consciousness seems most highly developed? Chief among them must be *instability*. The cerebral hemispheres are the characteristically 'high' nerve-centres, and we saw how indeterminate and unforeseeable their performances were in comparison with those of the basal ganglia and the cord. But this very vagueness constitutes their advantage. They allow their possessor to adapt his conduct to the minutest alterations in the environing circumstances, any one of which may be for him a sign, suggesting distant motives more powerful than any present solicitations of sense. It seems as if certain mechanical conclusions should be drawn from this state of things. An organ, swayed by slight impressions is an organ whose natural state is one of unstable equilibrium. We may imagine the various lines of discharge in the cerebrum to be almost on a par in point of permeability—what discharge a given small impression will produce may be called *accidental*, in the sense in which we say it is a matter of accident whether a rain-drop falling on a mountain ridge descend the eastern or the western slope. It is in this sense that we may call it a matter of accident whether a child be a boy or a girl. The ovum is so unstable a body that certain causes too minute for our apprehension may at a certain moment tip it one way or the other. The natural law of an organ constituted after this fashion can be nothing but a law of caprice. I do not see how one could reasonably expect from it any certain pursuance of useful lines of reaction, such as the few and fatally determined performances of the lower centres constitute within their narrow sphere. The dilemma in regard to the nervous system seems, in short, to be of the following kind. We may construct one which will react infallibly and certainly, but it will then be capable of reacting to very few changes in the environment—it will fail to be adapted to all the rest. We may, on the other hand, construct a nervous system potentially adapted to respond to an infinite variety of minute features in the situation; but its fallibility will then be as great as its elaboration. We can never be sure that its equilibrium will be upset in the appropriate direction. In short, a high brain may do many things, and may do each of them at a very slight hint. But its hair-trigger organization makes of it a happy-go-lucky, hit-or-miss affair. It is as likely to do the crazy as the sane thing at any given moment. A low brain does few things, and in doing them perfectly forfeits all other use. The performances of a high brain are like dice thrown forever on a table. Unless they be loaded, what chance is there that the highest number will turn up oftener than the lowest?

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All this is said of the brain as a physical machine pure and simple. *Can consciousness increase its efficiency by loading its dice?* Such is the problem.

Loading its dice would mean bringing a more or less constant pressure to bear in favor of *those* of its performances which make for the most permanent interests of the brain's owner; it would mean a constant inhibition of the tendencies to stray aside.

Well, just such pressure and such inhibition are what consciousness *seems* to be exerting all the while. And the interests in whose favor it seems to exert them are *its* interests and its alone, interests which it *creates*, and which, but for it, would have no status in the realm of being whatever. We talk, it is true, when we are darwinizing, as if the mere *body* that owns the brain had interests; we speak about the utilities of its various organs and how they help or hinder the body's survival; and we treat the survival as if it were an absolute end, existing as such in the physical world, a sort of actual *should-be*, presiding over the animal and judging his reactions, quite apart from the presence of any commenting intelligence outside. We forget that in the absence of some such superadded commenting intelligence (whether it

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be that of the animal itself, or only ours or Mr. Darwin's), the reactions cannot be properly talked of as 'useful' or 'hurtful' at all. Considered merely physically, all that can be said of them is that *if* they occur in a certain way survival will as a matter of fact prove to be their incidental consequence. The organs themselves, and all the rest of the physical world, will, however, all the time be quite indifferent to this consequence, and would quite as cheerfully, the circumstances changed, compass the animal's destruction. In a word, survival can enter into a purely physiological discussion only as an *hypothesis made by an onlooker*, about the future. But the moment you bring a consciousness into the midst, survival ceases to be a mere hypothesis. No longer is it, "*if* survival is to occur, then so and so must brain and other organs work." It has now become an imperative decree: "Survival *shall* occur, and therefore organs *must* so work!" *Real ends* appear for the first time now upon the world's stage. The conception of consciousness as a purely cognitive form of being, which is the pet way of regarding it in many idealistic schools, modern as well as ancient, is thoroughly anti-psychological, as the remainder of this book will show. Every actually existing consciousness seems to itself at any rate to be a *fighter for ends*, of which many, but for its presence, would not be ends at all. Its powers of cognition are mainly subservient to these ends, discerning which facts further them and which do not.

Now let consciousness only be what it seems to itself, and it will help an instable brain to compass its proper ends. The movements of the brain *per se* yield the means of attaining these ends mechanically, but only out of a lot of other ends, if so they may be called, which are not the proper ones of the animal, but often quite opposed. The brain is an instrument of possibilities, but of no certainties. But the consciousness, with its own ends present to it, and knowing also well which possibilities lead thereto and which away, will, if endowed with causal efficacy, reinforce the favorable possibilities and repress the unfavorable or indifferent ones. The nerve-currents, coursing through the cells and fibres, must in this case be supposed strengthened by the fact of their awaking one consciousness and dampened by awaking another. *How* such reaction of the consciousness upon the currents may occur must remain at present unsolved: it is enough for my purpose to have shown that it may not uselessly exist, and that the matter is less simple than the brain-automatists hold.

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All the facts of the natural history of consciousness lend color to this view. Consciousness, for example, is only intense when nerve-processes are hesitant. In rapid, automatic, habitual action it sinks to a minimum. Nothing could be more fitting than this, if consciousness have the teleological function we suppose; nothing more meaningless, if not. Habitual actions are certain, and being in no danger of going astray from their end, need no extraneous help. In hesitant action, there seem many alternative possibilities of final nervous discharge. The feeling awakened by the nascent excitement of each alternative nerve-tract seems by its attractive or repulsive quality to determine whether the excitement shall abort or shall become complete. Where indecision is great, as before a dangerous leap, consciousness is agonizingly intense. Feeling, from this point of view, may be likened to a cross-section of the chain of nervous discharge, ascertaining the links already laid down, and groping among the fresh ends presented to it for the one which seems best to fit the case.

The phenomena of 'vicarious function' which we studied in [Chapter II](#) seem to form another bit of circumstantial evidence. A machine in working order acts fatally in one way. Our consciousness calls this the right way. Take out a valve, throw a wheel out of gear or bend a pivot, and it becomes a different machine, acting just as fatally in another way which we call the wrong way. But the machine itself knows nothing of wrong or right: matter has no ideals to pursue. A locomotive will carry its train through an open drawbridge as cheerfully as to any other destination.

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A brain with part of it scooped out is virtually a new machine, and during the first days after the operation functions in a thoroughly abnormal manner. As a matter of fact, however, its performances become from day to day more normal, until at last a practised eye may be needed to suspect anything wrong. Some of the restoration is undoubtedly due to 'inhibitions' passing away. But if the consciousness which goes with the rest of the brain, be there not only in order to take cognizance of each functional error, but also to exert an efficient pressure to check it if it be a sin of commission, and to lend a strengthening hand if it be a weakness or sin of omission,—nothing seems more natural than that the remaining parts, assisted in this way, should by virtue of the principle of habit grow back to the old teleological modes of exercise for which they were at first incapacitated. Nothing, on the contrary, seems at first sight more unnatural than that they should vicariously take up the duties of a part now lost without those *duties as such* exerting any persuasive or coercive force. At the end of Chapter XXVI I shall return to this again.

There is yet another set of facts which seem explicable on the supposition that consciousness has causal efficacy. *It is a well-known fact that pleasures are generally associated with beneficial, pains with detrimental, experiences.* All the fundamental vital processes illustrate this law. Starvation, suffocation, privation of food, drink and sleep, work when exhausted, burns, wounds, inflammation, the effects of poison, are as disagreeable as filling the hungry stomach, enjoying rest and sleep after fatigue, exercise after rest, and a sound skin and unbroken bones at all times, are pleasant. Mr. Spencer and others have suggested that these coincidences are due, not to any pre-established harmony, but to the mere action of natural selection which would certainly kill off in the long-run any breed of creatures to whom the fundamentally noxious experience seemed enjoyable. An animal that should take pleasure in a feeling of suffocation would, if that pleasure were efficacious enough to make him immerse his head in water, enjoy a longevity of four or five minutes. But if pleasures and pains have no efficacy, one does not see (without some such *a priori* rational harmony as would be scouted by the 'scientific' champions of the automaton-theory) why the most noxious acts, such as burning, might not give thrills of delight, and the most necessary ones, such as breathing, cause agony. The exceptions to the law are, it is true, numerous, but relate to experiences that are either not vital or not universal. Drunkenness, for instance, which though noxious, is to many persons delightful, is a very exceptional experience. But, as the excellent physiologist Pick remarks, if all rivers and springs ran alcohol instead of water, either all men would now be born to hate it or our nerves would have been selected so as to drink it with impunity. The only considerable attempt, in fact, that has been made to explain the *distribution* of our feelings is that of Mr. Grant Allen in his suggestive little work *Physiological Aesthetics*; and his reasoning is based exclusively on that causal efficacy of pleasures and pains which the 'double-aspect' partisans so strenuously deny.

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Thus, then, from every point of view the circumstantial evidence against that theory is strong. *A priori* analysis of both brain-action and conscious action shows us that if the latter were efficacious it would, by its selective emphasis, make amends for the indeterminateness of the former; whilst the study *a posteriori* of the *distribution* of consciousness shows it to be exactly such as we might expect in an organ added for the sake of steering a nervous system grown too complex to regulate itself. The conclusion that it is useful is, after all this, quite justifiable. But, if it is useful, it must be so through its causal efficaciousness, and the automaton-theory must succumb to the theory of common-sense. I, at any rate (pending

metaphysical reconstructions not yet successfully achieved), shall have no hesitation in using the language of common-sense throughout this book.

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- [155] The Theory of Practice, vol. i, p. 416 ff.
- [156] The present writer recalls how in 1869, when still a medical student, he began to write an essay showing how almost every one who speculated about brain-processes illicitly interpolated into his account of them links derived from the entirely heterogeneous universe of Feeling. Spencer, Hodgson (in his Time and Space), Maudsley, Lockhart Clarke, Bain, Dr. S. Carpenter, and other authors were cited as having been guilty of the confusion. The writing was soon stopped because he perceived that the view which he was upholding against these authors was a pure conception, with no proofs to be adduced of its reality. Later it seemed to him that whatever *proofs* existed really told in favor of their view.
- [157] Chas. Mercier: The Nervous System and the Mind (1888), p. 9.
- [158] *Op. cit.* p. 11.
- [159] See in particular the end of [Chapter IX](#).
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CHAPTER VI.

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THE MIND-STUFF THEORY.

The reader who found himself swamped with too much metaphysics in the last chapter will have a still worse time of it in this one, which is exclusively metaphysical. Metaphysics means nothing but an unusually obstinate effort to think clearly. The fundamental conceptions of psychology are practically very clear to us, but theoretically they are very confused, and one easily makes the obscurest assumptions in this science without realizing, until challenged, what internal difficulties they involve. When these assumptions have once established themselves (as they have a way of doing in our very descriptions of the phenomenal facts) it is almost impossible to get rid of them afterwards or to make any one see that they are not essential features of the subject. The only way to prevent this disaster is to scrutinize them beforehand and make them give an articulate account of themselves before letting them pass. One of the obscurest of the assumptions of which I speak is *the assumption that our mental states are composite in structure, made up of smaller states conjoined*. This hypothesis has outward advantages which make it almost irresistibly attractive to the intellect, and yet it is inwardly quite unintelligible. Of its unintelligibility, however, half the writers on psychology seem unaware. As our own aim is *to understand* if possible, I make no apology for singling out this particular notion for very explicit treatment before taking up the descriptive part of our work. *The theory of 'mind-stuff' is the theory that our mental states are compounds*, expressed in its most radical form.

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EVOLUTIONARY PSYCHOLOGY DEMANDS A MIND-DUST.

In a general theory of evolution the inorganic comes first, then the lowest forms of animal and vegetable life, then forms of life that possess mentality, and finally those like ourselves that possess it in a high degree. As long as we keep to the consideration of purely outward facts, even the most complicated facts of biology, our task as evolutionists is comparatively easy. We are dealing all the time with matter and its aggregations and separations; and

although our treatment must perforce be hypothetical, this does not prevent it from being *continuous*. The point which as evolutionists we are bound to hold fast to is that all the new forms of being that make their appearance are really nothing more than results of the redistribution of the original and unchanging materials. The self-same atoms which, chaotically dispersed, made the nebula, now, jammed and temporarily caught in peculiar positions, form our brains; and the 'evolution' of the brains, if understood, would be simply the account of how the atoms came to be so caught and jammed. In this story no new *natures*, no factors not present at the beginning, are introduced at any later stage.

But with the dawn of consciousness an entirely new nature seems to slip in, something whereof the potency was *not* given in the mere outward atoms of the original chaos.

The enemies of evolution have been quick to pounce upon this undeniable discontinuity in the data of the world and many of them, from the failure of evolutionary explanations at this point, have inferred their general incapacity all along the line. Every one admits the entire incommensurability of feeling as such with material motion as such. "A motion became a feeling!"—no phrase that our lips can frame is so devoid of apprehensible meaning. Accordingly, even the vaguest of evolutionary enthusiasts, when deliberately comparing material with mental facts, have been as forward as any one else to emphasize the 'chasm' between the inner and the outer worlds.

"Can the oscillations of a molecule," says Mr. Spencer, "be represented side by side with a nervous shock [he means a mental shock], and the two be recognized as one? No effort enables us to assimilate them. That a unit of feeling has nothing in common with a unit of motion becomes more than ever manifest when we bring the two into juxtaposition."^[160]

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And again:

"Suppose it to have become quite clear that a shock in consciousness and a molecular motion are the subjective and objective faces of the same thing; we continue utterly incapable of uniting the two, so as to conceive that reality of which they are the opposite faces."^[161]

In other words, incapable of perceiving in them any common character. So Tyndall, in that lucky paragraph which has been quoted so often that every one knows it by heart:

"The passage from the physics of the brain to the corresponding facts of consciousness is unthinkable. Granted that a definite thought and a definite molecular action in the brain occur simultaneously; we do not possess the intellectual organ, nor apparently any rudiment of the organ, which would enable us to pass, by a process of reasoning, from one to the other."^[162]

Or in this other passage:

"We can trace the development of a nervous system and correlate with it the parallel phenomena of sensation and thought. We see with undoubting certainty that they go hand in hand. But we try to soar in a vacuum the moment we seek to comprehend the connection between them.... There is no fusion possible between the two classes of facts—no motor energy in the intellect of man to carry it without logical rupture from the one to the other."^[163]

None the less easily, however, when the evolutionary afflatus is upon them, do the very same writers leap over the breach whose flagrancy they are the foremost to announce, and talk as if mind grew out of body in a continuous way. Mr. Spencer, looking back on his

review of mental evolution, tells us how "in tracing up the increase we found ourselves passing *without break* from the phenomena of bodily life to the phenomena of mental life." [Pg 148]
 [164] And Mr. Tyndall, in the same Belfast Address from which we just quoted, delivers his other famous passage:

"Abandoning all disguise, the confession that I feel bound to make before you is that I prolong the vision backward across the boundary of the experimental evidence, and discern in that matter which we, in our ignorance and notwithstanding our professed reverence for its Creator, have hitherto covered with opprobrium the promise and potency of every form and quality of life."
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—mental life included, as a matter of course.

So strong a postulate is continuity! Now this book will tend to show that mental postulates are on the whole to be respected. The demand for continuity has, over large tracts of science, proved itself to possess true prophetic power. We ought therefore ourselves sincerely to try every possible mode of conceiving the dawn of consciousness so that it may *not* appear equivalent to the irruption into the universe of a new nature, non-existent until then.

Merely to call the consciousness 'nascent' will not serve our turn.^[166] It is true that the word signifies not yet *quite* born, and so seems to form a sort of bridge between existence and nonentity. But that is a verbal quibble. The fact is that discontinuity comes in if a new nature comes in at all. The *quantity* of the latter is quite immaterial. The girl in 'Midshipman Easy' could not excuse the illegitimacy of her child by saying, 'it was a little small one.' And Consciousness, however little, is an illegitimate birth in any philosophy that starts without it, and yet professes to explain all facts by continuous evolution. [Pg 149]

If evolution is to work smoothly, consciousness in some shape must have been present at the very origin of things. Accordingly we find that the more clear-sighted evolutionary philosophers are beginning to posit it there. Each atom of the nebula, they suppose, must have had an aboriginal atom of consciousness linked with it; and, just as the material atoms have formed bodies and brains by massing themselves together, so the mental atoms, by an analogous process of aggregation, have fused into those larger consciousnesses which we know in ourselves and suppose to exist in our fellow-animals. Some such doctrine of *atomistic hylozoism* as this is an indispensable part of a thorough-going philosophy of evolution. According to it there must be an infinite number of degrees of consciousness, following the degrees of complication and aggregation of the primordial mind-dust. To prove the separate existence of these degrees of consciousness by indirect evidence, since direct intuition of them is not to be had, becomes therefore the first duty of psychological evolutionism. [Pg 150]

SOME ALLEGED PROOFS THAT MIND-DUST EXISTS.

Some of this duty we find already performed by a number of philosophers who, though not interested at all in evolution, have nevertheless on independent grounds convinced themselves of the existence of a vast amount of sub-conscious mental life. The criticism of this general opinion and its grounds will have to be postponed for a while. At present let us merely deal with the arguments assumed to prove aggregation of bits of mind-stuff into distinctly sensible feelings. They are clear and admit of a clear reply.

The German physiologist A. Fick, in 1862, was, so far as I know, the first to use them. He made experiments on the discrimination of the feelings of warmth and of touch, when only a very small portion of the skin was excited through a hole in a card, the surrounding parts

being protected by the card. He found that under these circumstances mistakes were frequently made by the patient,^[167] and concluded that this must be because the number of sensations from the elementary nerve-tips affected was too small to sum itself distinctly into either of the qualities of feeling in question. He tried to show how a different manner of the summation might give rise in one case to the heat and in another to the touch.

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"A feeling of temperature," he says, "arises when the intensities of the units of feeling are evenly gradated, so that between two elements *a* and *b* no other unit can spatially intervene whose intensity is not also *between* that of *a* and *b*. A feeling of contact perhaps arises when this condition is not fulfilled. Both kinds of feeling, however, are composed of the same units."

But it is obviously far clearer to interpret such a gradation of intensities as a brain-fact than as a mind-fact. If in the brain a tract were first excited in one of the ways suggested by Prof. Fick, and then again in the other, it might very well happen, for aught we can say to the contrary, that the psychic accompaniment in the one case would be heat, and in the other pain. The pain and the heat would, however, not be composed of psychic units, but would each be the direct result of one total brain-process. So long as this latter interpretation remains open, Fick cannot be held to have proved psychic summation.

Later, both Spencer and Taine, independently of each other, took up the same line of thought. Mr. Spencer's reasoning is worth quoting *in extenso*. He writes:

"Although the individual sensations and emotions, real or ideal, of which consciousness is built up, appear to be severally simple, homogeneous, unanalyzable, or of inscrutable natures, yet they are not so. There is at least one kind of feeling which, as ordinarily experienced, seems elementary, that is demonstrably not elementary. And after resolving it into its proximate components, we can scarcely help suspecting that other apparently-elementary feelings are also compound, and may have proximate components like those which we can in this one instance identify.

"Musical sound is the name we give to this seemingly simple feeling which is clearly resolvable into simpler feelings. Well-known experiments prove that when equal blows or taps are made one after another at a rate not exceeding some sixteen per second, the effect of each is perceived as a separate noise; but when the rapidity with which the blows follow one another exceeds this, the noises are no longer identified in separate states of consciousness, and there arises in place of them a continuous state of consciousness, called a tone. In further increasing the rapidity of the blows, the tone undergoes the change of quality distinguished as rise in pitch; and it continues to rise in pitch as the blows continue to increase in rapidity, until it reaches an acuteness beyond which it is no longer appreciable as a tone. So that out of units of feeling of the same kind, many feelings distinguishable from one another in quality result, according as the units are more or less integrated.

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"This is not all. The inquiries of Professor Helmholtz have shown that when, along with one series of these rapidly-recurring noises, there is generated another series in which the noises are more rapid though not so loud, the effect is a change in that quality known as its *timbre*. As various musical instruments show us, tones which are alike in pitch and strength are distinguishable by their harshness or sweetness, their ringing or their liquid characters; and all their specific peculiarities are proved to arise from the combination of one, two, three, or more, supplementary series of recurrent noises with the chief series of recurrent noises. So that while the unlikenesses of feeling known as differences of pitch in tones are due to differences of integration among the recurrent noises

of one series, the unlikenesses of feeling known as differences of *timbre*, are due to the simultaneous integration with this series of other series having other degrees of integration. And thus an enormous number of qualitatively-contrasted kinds of consciousness that seem severally elementary prove to be composed of one simple kind of consciousness, combined and recombined with itself in multitudinous ways.

"Can we stop short here? If the different sensations known as sounds are built out of a common unit, is it not to be rationally inferred that so likewise are the different sensations known as tastes, and the different sensations known as odors, and the different sensations known as colors? Nay, shall we not regard it as probable that there is a unit common to all these strongly-contrasted classes of sensations? If the unlikenesses among the sensations of each class may be due to unlikenesses among the modes of aggregation of a unit of consciousness common to them all; so too may the much greater unlikenesses between the sensations of each class and those of other classes. There may be a single primordial element of consciousness, and the countless kinds of consciousness may be produced by the compounding of this element with itself and the recompounding of its compounds with one another in higher and higher degrees: so producing increased multiplicity, variety, and complexity.

"Have we any clue to this primordial element? I think we have. That simple mental impression which proves to be the unit of composition of the sensation of musical tone, is allied to certain other simple mental impressions differently originated. The subjective effect produced by a crack or noise that has no appreciable duration is little else than a nervous shock. Though we distinguish such a nervous shock as belonging to what we call sounds, yet it does not differ very much from nervous shocks of other kinds. An electric discharge sent through the body causes a feeling akin to that which a sudden loud report causes. A strong unexpected impression made through the eyes, as by a flash of lightning, similarly gives rise to a start or shock; and though the feeling so named seems, like the electric shock, to have the body at large for its seat, and may therefore be regarded as the correlative rather of the efferent than of the afferent disturbance, yet on remembering the mental change that results from the instantaneous transit of an object across the field of vision, I think it may be perceived that the feeling accompanying the efferent disturbance is itself reduced very nearly to the same form. The state of consciousness so generated is, in fact, comparable in quality to the initial state of consciousness caused by a blow (distinguishing it from the pain or other feeling that commences the instant after); which state of consciousness caused by a blow may be taken as the primitive and typical form of the nervous shock. The fact that sudden brief disturbances thus set up by different stimuli through different sets of nerves cause feelings scarcely distinguishable in quality will not appear strange when we recollect that distinguishableness of feeling implies appreciable duration; and that when the duration is greatly abridged, nothing more is known than that some mental change has occurred and ceased. To have a sensation of redness, to know a tone as acute or grave, to be conscious of a taste as sweet, implies in each case a considerable continuity of state. If the state does not last long enough to admit of its being contemplated, it cannot be classed as of this or that kind; and becomes a momentary modification very similar to momentary modifications otherwise caused.

"It is possible, then—may we not even say probable?—that something of the same order as that which we call a nervous shock is the ultimate unit of consciousness; and that all the unlikenesses among our feelings result from unlike modes of integration of this ultimate unit. I say of the same order,

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because there are discernible differences among nervous shocks that are differently caused; and the primitive nervous shock probably differs somewhat from each of them. And I say of the same order, for the further reason that while we may ascribe to them a general likeness in nature, we must suppose a great unlikeness in degree. The nervous shocks recognized as such are violent—must be violent before they can be perceived amid the procession of multitudinous vivid feelings suddenly interrupted by them. But the rapidly-recurring nervous shocks of which the different forms of feeling consist, we must assume to be of comparatively moderate, or even of very slight intensity. Were our various sensations and emotions composed of rapidly-recurring shocks as strong as those ordinarily called shocks, they would be unbearable; indeed life would cease at once. We must think of them rather as successive faint pulses of subjective change, each having the same quality as the strong pulse of subjective change distinguished as a nervous shock."^[168]

INSUFFICIENCY OF THESE PROOFS.

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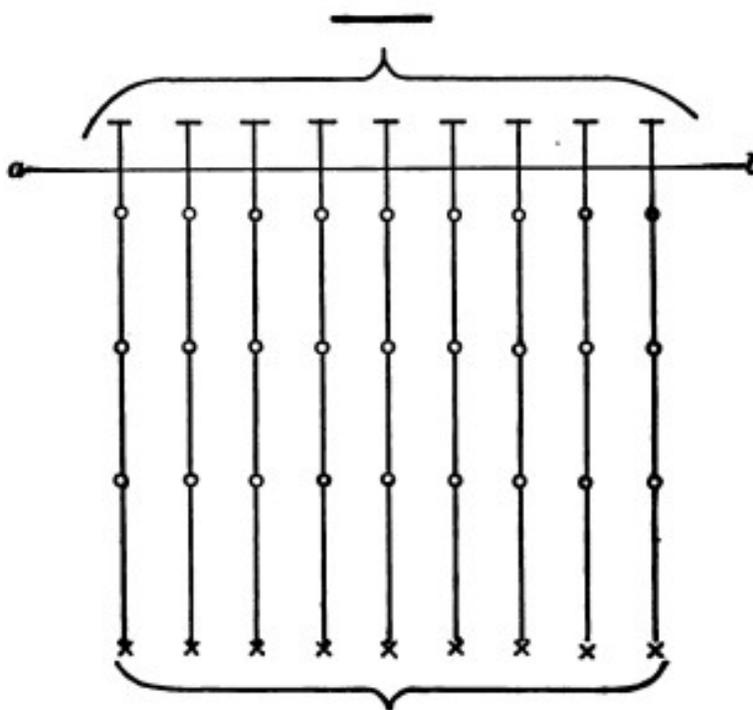


FIG. 25.

Convincing as this argument of Mr. Spencer's may appear on a first reading, it is singular how weak it really is.^[169] We do, it is true, when we study the connection between a musical note and its outward cause, find the note simple and continuous while the cause is multiple and discrete. Somewhere, then, there *is* a transformation, reduction, or fusion. The question is, Where?—in the nerve-world or in the mind-world? Really we have no experimental proof by which to decide; and if decide we must, analogy and *a priori* probability can alone guide us. Mr. Spencer assumes that the fusion must come to pass in the mental world, and that the physical processes get through air and ear, auditory nerve and medulla, lower brain and hemispheres, without their number being reduced. Figure 25 will make the point clear.

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Let the line *a—b* represent the threshold of consciousness: then everything drawn below that line will symbolize a physical process, everything above it will mean a fact of mind. Let the crosses stand for the physical blows, the circles for the events in successively higher orders of nerve-cells, and the horizontal marks for the facts of feeling. Spencer's argument implies

that each order of cells transmits just as many impulses as it receives to the cells above it; so that if the blows come at the rate of 20,000 in a second the cortical cells discharge at the same rate, and one unit of feeling corresponds to each one of the 20,000 discharges. Then, and only then, does 'integration' occur, by the 20,000 units of feeling 'compounding with themselves' into the 'continuous state of consciousness' represented by the short line at the top of the figure.

Now such an interpretation as this flies in the face of physical analogy, no less than of logical intelligibility. Consider physical analogy first,

A pendulum may be deflected by a single blow, and swing back. Will it swing back the more often the more we multiply the blows? No; for if they rain upon the pendulum too fast, it will not swing at all but remain deflected in a sensibly stationary state. In other words, increasing the cause numerically need not equally increase numerically the effect. Blow through a tube: you get a certain musical note; and increasing the blowing increases for a certain time the loudness of the note. Will this be true indefinitely? No; for when a certain force is reached, the note, instead of growing louder, suddenly disappears and is replaced by its higher octave. Turn on the gas slightly and light it: you get a tiny flame. Turn on more gas, and the breadth of the flame increases. Will this relation increase indefinitely? No, again; for at a certain moment up shoots the flame into a ragged streamer and begins to hiss. Send slowly through the nerve of a frog's gastrocnemius muscle a succession of galvanic shocks: you get a succession of twitches. Increasing the number of shocks does not increase the twitching; on the contrary, it stops it, and we have the muscle in the apparently stationary state of contraction called tetanus. This last fact is the true analogue of what must happen between the nerve-cell and the sensory fibre. It is certain that cells are more inert than fibres, and that rapid vibrations in the latter can only arouse relatively simple processes or states in the former. The higher cells may have even a slower rate of explosion than the lower, and so the twenty thousand supposed blows of the outer air may be 'integrated' in the cortex into a very small number of cell-discharges in a second. This other diagram will serve to contrast this supposition with Spencer's.

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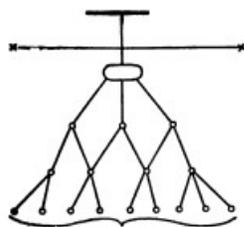


FIG. 26.

In Fig. 26 all 'integration' occurs below the threshold of consciousness. The frequency of cell-events becomes more and more reduced as we approach the cells to which feeling is most directly attached, until at last we come to a condition of things symbolized by the larger ellipse, which may be taken to stand for some rather massive and slow process of tension and discharge in the cortical centres, to which, *as a whole*, the feeling of musical tone symbolized by the line at the top of the diagram *simply and totally* corresponds. It is as if a long file of men were to start one after the other to reach a distant point. The road at first is good and they keep their original

distance apart. Presently it is intersected by bogs each worse than the last, so that the front men get so retarded that the hinder ones catch up with them before the journey is done, and all arrive together at the goal.^[170]

On this supposition there *are* no unperceived units of mind-stuff preceding and composing the full consciousness. The latter is itself an immediate psychic fact and bears an immediate relation to the neural state which is its unconditional accompaniment. Did each neural shock give rise to its own psychic shock, and the psychic shocks then combine, it would be impossible to understand why severing one part of the central nervous system from another should break up the integrity of the consciousness. The cut has nothing to do with the psychic world. The atoms of mind-stuff ought to float off from the nerve-matter on either side of it, and come together over it and fuse, just as well as if it had not been made. We know, however, that they do not; that severance of the paths of conduction between a man's left auditory centre or optical centre and the rest of his cortex will sever all communication between the words which he hears or sees written and the rest of his ideas.

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Moreover, if feelings can mix into a *tertium quid*, why do we not take a feeling of greenness and a feeling of redness, and make a feeling of yellowness out of them? Why has optics neglected the open road to truth, and wasted centuries in disputing about theories of color-composition which two minutes of introspection would have settled forever^[171] We cannot mix feelings as such, though we may mix the objects we feel, and from *their* mixture get new feelings. We cannot even (as we shall later see) have two feelings in our mind at once. At most we can compare together *objects previously presented* to us in distinct feelings; but then we find each object stubbornly maintaining its separate identity before consciousness, whatever the verdict of the comparison may be.^[172]

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SELF-COMPOUNDING OF MENTAL FACTS IS INADMISSIBLE.

But there is a still more fatal objection to the theory of mental units 'compounding with themselves' or 'integrating.' It is logically unintelligible; it leaves out the essential feature of all the 'combinations' we actually know.

All the 'combinations' which we actually know are EFFECTS, wrought by the units said to be 'combined,' UPON SOME ENTITY OTHER THAN THEMSELVES. Without this feature of a medium or vehicle, the notion of combination has no sense.

"A multitude of contractile units, by joint action, and by being all connected, for instance, with a single tendon, will pull at the same, and will bring about a dynamical effect which is undoubtedly the resultant of their combined individual energies.... On the whole, tendons are to muscular fibres, and bones are to tendons, combining recipients of mechanical energies. A medium of composition is indispensable to the summation of energies. To realize the complete dependence of mechanical resultants on a combining substratum, one may fancy for a moment all the individually contracting muscular elements severed from their attachments. They might then still be capable of contracting with the same energy as before, yet no co-operative result would be accomplished. The medium of dynamical combination would be wanting. The multiple energies, singly exerted on no common recipient, would lose themselves on entirely isolated and disconnected efforts."^[173]

In other words, no possible number of entities (call them as you like, whether forces, material particles, or mental elements) can sum *themselves* together. Each remains, in the sum, what it always was; and the sum itself exists only *for a bystander* who happens to overlook the units and to apprehend the sum as such; or else it exists in the shape of some other *effect* on an entity external to the sum itself. Let it not be objected that H₂ and O combine of themselves into 'water,' and thenceforward exhibit new properties. They do not. The 'water' is just the old atoms in the new position, H-O-H; the 'new properties' are just their combined *effects*, when in this position, upon external media, such as our sense-organs and the various reagents on which water may exert its properties and be known.

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"Aggregations are organized wholes only when they behave as such in the presence of other things. A statue is an aggregation of particles of marble, but as such it has no unity. For the spectator it is one; in itself it is an aggregate; just as, to the consciousness of an ant crawling over it, it may again appear a mere aggregate. No summing up of parts can make an unity of a mass of discrete constituents, unless this unity exist for some other subject, not for the mass itself."^[174]

Just so, in the parallelogram of forces, the 'forces' themselves do not combine into the diagonal resultant; a *body* is needed on which they may impinge, to exhibit their resultant

effect. No more do musical sounds combine *per se* into concords or discords. Concord and discord are names for their combined effects on that external medium, the *ear*.

Where the elemental units are supposed to be feelings, the case is in no wise altered. Take a hundred of them, shuffle them and pack them as close together as you can (whatever that may mean); still each remains the same feeling it always was, shut in its own skin, windowless, ignorant of what the other feelings are and mean. There would be a hundred-and-first feeling there, if, when a group or series of such feelings were set up, a consciousness *belonging to the group as such* should emerge. And this 101st feeling would be a totally new fact; the 100 original feelings might, by a curious physical law, be a signal for its *creation*, when they came together; but they would have no substantial identity with it, nor it with them, and one could never deduce the one from the others, or (in any intelligible sense) say that they *evolved* it.

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Take a sentence of a dozen words, and take twelve men and tell to each one word. Then stand the men in a row or jam them in a bunch, and let each think of his word as intently as he will; nowhere will there be a consciousness of the whole sentence.^[175] We talk of the 'spirit of the age,' and the 'sentiment of the people,' and in various ways we hypostatize 'public opinion.' But we know this to be symbolic speech, and never dream that the spirit, opinion, sentiment, etc., constitute a consciousness other than, and additional to, that of the several individuals whom the words 'age,' 'people,' or 'public' denote. The private minds do not agglomerate into a higher compound mind. This has always been the invincible contention of the spiritualists against the associationists in Psychology,—a contention which we shall take up at greater length in [Chapter X](#). The associationists say the mind is constituted by a multiplicity of distinct 'ideas' *associated* into a unity. There is, they say, an idea of *a*, and also an idea of *b*. *Therefore*, they say, there is an idea of *a + b*, or of *a* and *b* together. Which is like saying that the mathematical square of *a* plus that of *b* is equal to the square of *a + b*, a palpable untruth. Idea of *a* + idea of *b* is *not* identical with idea of (*a + b*). It is one, they are two; in it, what knows *a* also knows *b*; in them, what knows *a* is expressly posited as not knowing *b*; etc. In short, the two separate ideas can never by any logic be made to figure as one and the same thing as the 'associated' idea.

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This is what the spiritualists keep saying; and since we do, as a matter of fact, have the 'compounded' idea, and do know *a* and *b* together, they adopt a farther hypothesis to explain that fact. The separate ideas exist, they say, but *affect* a third entity, the soul. *This* has the 'compounded' idea, if you please so to call it; and the compounded idea is an altogether new psychic fact to which the separate ideas stand in the relation, not of constituents, but of occasions of production.

This argument of the spiritualists against the associationists has never been answered by the latter. It holds good against any talk about self-compounding amongst feelings, against any 'blending,' or 'complication,' or 'mental chemistry,' or 'psychic synthesis,' which supposes a resultant consciousness to float off from the constituents *per se*, in the absence of a supernumerary principle of consciousness which they may affect. The mind-stuff theory, in short, is unintelligible. Atoms of feeling cannot compose higher feelings, any more than atoms of matter can compose physical things! The 'things,' for a clear-headed atomistic evolutionist, are not. Nothing is but the everlasting atoms. When grouped in a certain way, *we* name them this 'thing' or that; but the thing we name has no existence out of our mind. So of the states of mind which are supposed to be compound because they know many different things together. Since indubitably such states do exist, they must exist as single new facts, effects, possibly, as the spiritualists say, on the Soul (we will not decide that point here), but at any rate independent and integral, and not compounded of psychic atoms.^[176]

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CAN STATES OF MIND BE UNCONSCIOUS?

The passion for unity and smoothness is in some minds so insatiate that, in spite of the logical clearness of these reasonings and conclusions, many will fail to be influenced by them. They establish a sort of disjointedness in things which in certain quarters will appear intolerable. They sweep away all chance of 'passing without break' either from the material to the mental, or from the lower to the higher mental; and they thrust us back into a pluralism of consciousnesses—each arising discontinuously in the midst of two disconnected worlds, material and mental—which is even worse than the old notion of the separate creation of each particular soul. But the malcontents will hardly try to refute our reasonings by direct attack. It is more probable that, turning their back upon them altogether, they will devote themselves to sapping and mining the region roundabout until it is a bog of logical liquefaction, into the midst of which all definite conclusions of any sort may be trusted ere long to sink and disappear.

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Our reasonings have assumed that the 'integration' of a thousand psychic units must be either just the units over again, simply rebaptized, or else something real, but then other than and additional to those units; that if a certain existing fact is that of a thousand feelings, it cannot at the same time be that of ONE feeling; for the essence of feeling is to be felt, and as a psychic existent *feels*, so it must *be*. If the one feeling feels like no one of the thousand, in what sense can it be said to *be* the thousand? These assumptions are what the monists will seek to undermine. The Hegelizers amongst them will take high ground at once, and say that the glory and beauty of the psychic life is that in it all contradictions find their reconciliation; and that it is just because the facts we are considering *are* facts of the self that they are both one and many at the same time. With this intellectual temper I confess that I cannot contend. As in striking at some unresisting gossamer with a club, one but overreaches one's self, and the thing one aims at gets no harm. So I leave this school to its devices.

The other monists are of less deliquescent frame, and try to break down distinctness among mental states by *making a distinction*. This sounds paradoxical, but it is only ingenious. The distinction is that *between the unconscious and the conscious being of the mental state*. It is the sovereign means for believing what one likes in psychology, and of turning what might become a science into a tumbling-ground for whimsies. It has numerous champions, and elaborate reasons to give for itself. We must therefore accord it due consideration. In discussing the question:

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DO UNCONSCIOUS MENTAL STATES EXIST?

it will be best to give the list of so-called proofs as briefly as possible, and to follow each by its objection, as in scholastic books.^[177]

First Proof. The *minimum visibile*, the *minimum audibile*, are objects composed of parts. How can the whole affect the sense unless each part does? And yet each part does so without being separately sensible. Leibnitz calls the total consciousness an '*aperception*,' the supposed insensible consciousness by the name of '*petites perceptions*.'

"To judge of the latter," he says, "I am accustomed to use the example of the roaring of the sea with which one is assailed when near the shore. To hear this noise as one does, one must hear the parts which compose its totality, that is, the noise of each wave,... although this noise would not be noticed if its wave were alone. One must be affected a little by the movement of one wave, one must have some perception of each several noise, however small it be. Otherwise one would not hear that of 100,000 waves, for of 100,000 zeros one can never make a quantity."^[178]

Reply. This is an excellent example of the so-called 'fallacy of division,' or predicating what is true only of a collection, of each member of the collection distributively. It no more follows that if a thousand things together cause sensation, one thing alone must cause it, than it follows that if one pound weight moves a balance, then one ounce weight must move it too, in less degree. One ounce weight does not move it *at all*; its movement *begins* with the pound. At most we can say that each ounce affects it in *some* way which helps the advent of that movement. And so each infra-sensible stimulus to a nerve no doubt affects the nerve and helps the birth of sensation when the other stimuli come. But this affection is a nerve-affection, and there is not the slightest ground for supposing it to be a 'perception' unconscious of itself. "A certain *quantity* of the cause may be a necessary condition to the production of *any* of the effect,"^[179] when the latter is a mental state.

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Second Proof. In all acquired dexterities and habits, secondarily automatic performances as they are called, we do what *originally* required a chain of deliberately conscious perceptions and volitions. As the actions still keep their intelligent character, intelligence must still preside over their execution. But since our consciousness seems all the while elsewhere engaged, such intelligence must consist of unconscious perceptions, inferences, and volitions.

Reply. There is more than one alternative explanation in accordance with larger bodies of fact. One is that the perceptions and volitions in habitual actions may be performed consciously, only so quickly and inattentively that no *memory* of them remains. Another is that the consciousness of these actions exists, but is *split-off* from the rest of the consciousness of the hemispheres. We shall find in [Chapter X](#) numerous proofs of the reality of this split-off condition of portions of consciousness. Since in man the hemispheres indubitably co-operate in these secondarily automatic acts, it will not do to say either that they occur without consciousness or that their consciousness is that of the lower centres, which we know nothing about. But either lack of memory or split-off cortical consciousness will certainly account for all of the facts.^[180]

Third Proof. Thinking of A, we presently find ourselves thinking of C. Now B is the natural logical link between A and C, but we have no consciousness of having thought of B. It must have been in our mind '*unconsciously*,' and in that state affected the sequence of our ideas.

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Reply. Here again we have a choice between more plausible explanations. Either B was consciously there, but the next instant forgotten, or its *brain-tract* alone was adequate to do the whole work of coupling A with C, without the idea B being aroused at all, whether consciously or '*unconsciously*.'

Fourth Proof. Problems unsolved when we go to bed are found solved in the morning when we wake. Somnambulists do rational things. We awaken punctually at an hour predetermined overnight, etc. Unconscious thinking, volition, time-registration, etc., must have presided over these acts.

Reply. Consciousness forgotten, as in the hypnotic trance.

Fifth Proof. Some patients will often, in an attack of epileptiform unconsciousness, go through complicated processes, such as eating a dinner in a restaurant and paying for it, or making a violent homicidal attack. In trance, artificial or pathological, long and complex performances, involving the use of the reasoning powers, are executed, of which the patient is wholly unaware on coming to.

Reply. Rapid and complete oblivescence is certainly the explanation here. The analogue again is hypnotism. Tell the subject of an hypnotic trance, during his trance, that he *will* remember, and he may remember everything perfectly when he awakes, though without your telling him no memory would have remained. The extremely rapid oblivescence of common *dreams* is a familiar fact.

Sixth Proof. In a musical concord the vibrations of the several notes are in relatively simple ratios. The mind must unconsciously count the vibrations, and be pleased by the simplicity which it finds.

Reply. The brain-process produced by the simple ratios may be as directly agreeable as the conscious process of comparing them would be. No counting, either conscious or 'unconscious,' is required.

Seventh Proof. Every hour we make theoretic judgments and emotional reactions, and exhibit practical tendencies, for which we can give no explicit logical justification, but which are good inferences from certain premises. We know more than we can say. Our conclusions run ahead of our power to analyze their grounds. A child, ignorant of the axiom that two things equal to the same are equal to each other, applies it nevertheless in his concrete judgments unerringly. A boor will use the *dictum de omni et nullo* who is unable to understand it in abstract terms.

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"We seldom consciously think how our house is painted, what the shade of it is, what the pattern of our furniture is, or whether the door opens to the right or left, or out or in. But how quickly should we notice a change in any of these things! Think of the door you have most often opened, and tell, if you can, whether it opens to the right or left, out or in. Yet when you open the door you never put the hand on the wrong side to find the latch, nor try to push it when it opens with a pull.... What is the precise characteristic in your friend's step that enables you to recognize it when he is coming? Did you ever consciously think the idea, 'if I run into a solid piece of matter I shall get hurt, or be hindered in my progress'? and do you avoid running into obstacles because you ever distinctly conceived, or consciously acquired and thought, that idea?"^[181]

Most of our knowledge is at all times potential. We act in accordance with the whole drift of what we have learned, but few items rise into consciousness at the time. Many of them, however, we may recall at will. All this co-operation of unrealized principles and facts, of potential knowledge, with our actual thought is quite inexplicable unless we suppose the perpetual existence of an immense mass of *ideas in an unconscious state*, all of them exerting a steady pressure and influence upon our conscious thinking, and many of them in such continuity with it as ever and anon to become conscious themselves.

Reply. No such mass of ideas is supposable. But there are all kinds of short-cuts in the brain; and processes not aroused strongly enough to give any 'idea' distinct enough to be a premise, may, nevertheless, help to determine just that resultant process of whose psychic accompaniment the said idea *would* be a premise, if the idea existed at all. A certain overtone may be a feature of my friend's voice, and may conspire with the other tones thereof to arouse in my brain the process which suggests to my consciousness his name. And yet I may be ignorant of the overtone *per se*, and unable, even when he speaks, to tell whether it be there or no. It leads me to the idea of the name; but it produces in me no such cerebral process as that to which the *idea of the overtone* would correspond. And similarly of our learning. Each subject we learn leaves behind it a modification of the brain, which makes it impossible for the latter to react upon things just as it did before; and the result of the difference may be a tendency to act, though with no idea, much as we should *if* we were consciously thinking about the subject. The becoming conscious of the latter at will is equally readily explained as a result of the brain-modification. This, as Wundt phrases it, is a 'predisposition' to bring forth the conscious idea of the original subject, a predisposition which other stimuli and brain-processes may convert into an actual result. But such a predisposition is no 'unconscious idea;' it is only a particular collocation of the molecules in certain tracts of the brain.

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Eighth Proof. Instincts, as pursuits of ends by appropriate means, are manifestations of intelligence; but as the ends are not foreseen, the intelligence must be unconscious.

Reply. Chapter XXIV will show that all the phenomena of instinct are explicable as actions of the nervous system, mechanically discharged by stimuli to the senses.

Ninth Proof. In sense-perception we have results in abundance, which can only be explained as conclusions drawn by a process of unconscious inference from data given to sense. A small human image on the retina is referred, not to a pygmy, but to a distant man of normal size. A certain gray patch is inferred to be a white object seen in a dim light. Often the inference leads us astray: e.g., pale gray against pale green looks red, because we take a wrong premise to argue from. We think a green film is spread over everything; and knowing that under such a film a red thing would look gray, we wrongly infer from the gray appearance that a red thing must be there. Our study of space-perception in Chapter XVIII will give abundant additional examples both of the truthful and illusory percepts which have been explained to result from unconscious logic operations. [Pg 169]

Reply. That chapter will also in many cases refute this explanation. Color-and light-contrast are certainly purely sensational affairs, in which inference plays no part. This has been satisfactorily proved by Hering,^[182] and shall be treated of again in Chapter XVII. Our rapid judgments of size, shape, distance, and the like, are best explained as processes of simple cerebral association. Certain sense-impressions directly stimulate brain-tracts, of whose activity ready-made conscious percepts are the immediate psychic counterparts. They do this by a mechanism either connate or acquired by habit. It is to be remarked that Wundt and Helmholtz, who in their earlier writings did more than any one to give vogue to the notion that unconscious inference is a vital factor in sense-perception, have seen fit on later occasions to modify their views and to admit that results *like* those of reasoning may accrue without any actual reasoning process unconsciously taking place.^[183] Maybe the excessive and riotous applications made by Hartmann of their principle have led them to this change. It would be natural to feel towards him as the sailor in the story felt towards the horse who got his foot into the stirrup,— "If you're going to get on, I must get off."

Hartmann fairly boxes the compass of the universe with the principle of unconscious thought. For him there is no namable thing that does not exemplify it. But his logic is so lax and his failure to consider the most obvious alternatives so complete that it would, on the whole, be a waste of time to look at his arguments in detail. The same is true of Schopenhauer, in whom the mythology reaches its climax. The visual perception, for example, of an object in space results, according to him, from the intellect performing the following operations, all unconscious. First, it apprehends the inverted retinal image and turns it right side up, constructing *flat space* as a preliminary operation; then it computes from the angle of convergence of the eyeballs that the two retinal images must be the projection of but a single *object*; thirdly, it constructs the third dimension and sees this object *solid*; fourthly, it assigns its *distance*; and fifthly, in each and all of these operations it gets the objective character of what it 'constructs' by unconsciously inferring it as the only possible *cause* of some sensation which it unconsciously feels.^[184] Comment on this seems hardly called for. It is, as I said, pure mythology. [Pg 170]

None of these facts, then, appealed to so confidently in proof of the existence of ideas in an unconscious state, prove anything of the sort. They prove either that conscious ideas were present which the next instant were forgotten; or they prove that certain results, *similar* to results of reasoning, may be wrought out by rapid brain-processes to which no ideation seems attached. But there is one more argument to be alleged, less obviously insufficient than those which we have reviewed, and demanding a new sort of reply.

Tenth Proof. There is a great class of experiences in our mental life which may be described as discoveries that a subjective condition which we have been having is really something different from what we had supposed. We suddenly find ourselves bored by a thing which we thought we were enjoying well enough; or in love with a person whom we imagined we only liked. Or else we deliberately analyze our motives, and find that at bottom they contain jealousies and cupidities which we little suspected to be there. Our feelings towards people are perfect wells of motivation, unconscious of itself, which introspection brings to light. And our sensations likewise: we constantly discover new elements in sensations which we have been in the habit of receiving all our days, elements, too, which have been there from the first, since otherwise we should have been unable to distinguish the sensations containing them from others nearly allied. The elements must exist, for we use them to discriminate by; but they must exist in an unconscious state, since we so completely fail to single them out.^[185] The books of the analytic school of psychology abound in examples of the kind. Who knows the countless associations that mingle with his each and every thought? Who can pick apart all the nameless feelings that stream in at every moment from his various internal organs, muscles, heart, glands, lungs, etc., and compose in their totality his sense of bodily life? Who is aware of the part played by feelings of innervation and suggestions of possible muscular exertion in all his judgments of distance, shape, and size? Consider, too, the difference between a sensation which we simply *have* and one which we *attend to*. Attention gives results that seem like fresh creations; and yet the feelings and elements of feeling which it reveals must have been already there—in an unconscious state. We all know *practically* the difference between the so-called sonant and the so-called surd consonants, between D, B, Z, G, V, and T, P, S, K, F, respectively. But comparatively few persons know the difference *theoretically*, until their attention has been called to what it is, when they perceive it readily enough. The sonants are nothing but the surds plus a certain element, which is alike in all, superadded. That element is the laryngeal sound with which they are uttered, surds having no such accompaniment. When we hear the sonant letter, both its component elements must really be in our mind; but we remain unconscious of what they really are, and mistake the letter for a simple quality of sound until an effort of attention teaches us its two components. There exist a host of sensations which most men pass through life and never attend to, and consequently have only in an unconscious way. The feelings of opening and closing the glottis, of making tense the tympanic membrane, of accommodating for near vision, of intercepting the passage from the nostrils to the throat, are instances of what I mean. Every one gets these feelings many times an hour; but few readers, probably, are conscious of exactly what sensations are meant by the names I have just used. All these facts, and an enormous number more, seem to prove conclusively that, in addition to the fully conscious way in which an idea may exist in the mind, there is also an unconscious way; that it is unquestionably the same identical idea which exists in these two ways; and that therefore any arguments against the mind-stuff theory, based on the notion that *esse* in our mental life is *sentiri*, and that an idea must consciously be felt as what it is, fall to the ground.

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Objection. These reasonings are one tissue of confusion. Two states of mind which refer to the same external reality, or two states of mind the later one of which refers to the earlier, are described as the same state of mind, or 'idea,' published as it were in two editions; and then whatever qualities of the second edition are found openly lacking in the first are explained as having really been there, only in an 'unconscious' way. It would be difficult to believe that intelligent men could be guilty of so patent a fallacy, were not the history of psychology there to give the proof. The psychological stock-in-trade of some authors is the belief that two thoughts about one thing are virtually the same thought, and that this same thought may in subsequent reflections become more and more *conscious* of what it really *was* all along from the first. But once make the distinction between simply *having an idea* at the moment of its presence and subsequently knowing all sorts of things *about it*; make moreover that between a state of mind itself, taken as a subjective fact, on the one hand, and

the objective thing it knows, on the other, and one has no difficulty in escaping from the labyrinth.

Take the latter distinction first: Immediately all the arguments based on sensations and the new features in them which attention brings to light fall to the ground. The sensations of the B and the V when we attend to these sounds and analyze out the laryngeal contribution which makes them differ from P and F respectively, are *different sensations* from those of the B and the V taken in a simple way. They stand, it is true, for the *same letters*, and thus mean the *same outer realities*; but they are different mental affections, and certainly depend on widely different processes of cerebral activity. It is unbelievable that two mental states so different as the passive reception of a sound as a whole, and the analysis of that whole into distinct ingredients by voluntary attention, should be due to processes at all similar. And the subjective difference does not consist in that the first-named state *is* the second in an 'unconscious' form. It is an absolute psychic difference, even greater than that between the states to which two different surds will give rise. The same is true of the other sensations chosen as examples. The man who learns for the first time how the closure of his glottis feels, experiences in this discovery an absolutely new psychic modification, the like of which he never had before. He had another feeling before, a feeling incessantly renewed, and of which the same glottis was the organic starting point; but that was not the later feeling in an 'unconscious' state; it was a feeling *sui generis* altogether, although it took cognizance of the same bodily part, the glottis. We shall see, hereafter, that the same reality can be cognized by an endless number of psychic states, which may differ *toto caelo* among themselves, without ceasing on that account to refer to the reality in question. Each of them is a conscious fact: none of them has any mode of being whatever except a certain way of being felt at the moment of being present. It is simply unintelligible and fantastical to say, because they point to the same outer reality, that they must therefore be so many editions of the same 'idea,' now in a conscious and now in an 'unconscious' phase. There is only one 'phase' in which an idea can be, and that is a fully conscious condition. If it is not in that condition, then it is not at all. Something else is, in its place. The something else may be a merely physical brain-process, or it may be another conscious idea. Either of these things may perform much the same *function* as the first idea, refer to the same object, and roughly stand in the same relations to the upshot of our thought. But that is no reason why we should throw away the logical principle of identity in psychology, and say that, however it may fare in the outer world, the mind at any rate is a place in which a thing can be all kinds of other things without ceasing to be itself as well.

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Now take the other cases alleged, and the other distinction, that namely between *having* a mental state and knowing all *about* it. The truth is here even simpler to unravel. When I decide that I have, without knowing it, been for several weeks in love, I am simply giving a name to a state which previously *I have not named*, but which was fully conscious; which had no residual mode of being except the manner in which it was conscious; and which, though it was a feeling towards the same person for whom I now have a much more inflamed feeling, and though it continuously led into the latter, and is similar enough to be called by the same name, is yet in no sense identical with the latter, and least of all in an 'unconscious' way. Again, the feelings from our viscera and other dimly-felt organs, the feelings of innervation (if such there be), and those of muscular exertion which, in our spatial judgments, are supposed unconsciously to determine what we shall perceive, are just exactly what we feel them, perfectly determinate conscious states, not vague editions of other conscious states. They may be faint and weak; they may be very vague cognizers of the same realities which other conscious states cognize and name exactly; they may be unconscious of much in the reality which the other states are conscious of. But that does not make them *in themselves* a whit dim or vague or unconscious. They *are* eternally as they feel when they exist, and can, neither actually nor potentially, be identified with anything else than their own faint selves. A faint feeling may be looked back upon and classified and understood in its relations to what went before or after it in the stream of thought. But it, on

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the one hand, and the later state of mind which knows all these things about it, on the other, are surely not two conditions, one conscious and the other 'unconscious,' of the same identical psychic fact. It is the destiny of thought that, on the whole, our early ideas are superseded by later ones, giving fuller accounts of the same realities. But none the less do the earlier and the later ideas preserve their own several substantive identities as so many several successive states of mind. To believe the contrary would make any definite science of psychology impossible. The only identity to be found among our successive ideas is their similarity of cognitive or representative function as dealing with the same objects. Identity of *being*, there is none; and I believe that throughout the rest of this volume the reader will reap the advantages of the simpler way of formulating the facts which is here begun.^[186]

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So we seem not only to have ascertained the unintelligibility of the notion that a mental fact can be two things at once, and that what seems like one feeling, of blueness for example, or of hatred, may really and 'unconsciously' be ten thousand elementary feelings which do not resemble blueness or hatred at all, but we find that we can express all the observed facts in other ways. The mind-stuff theory, however, though scotched, is, we may be sure, not killed. If we ascribe consciousness to unicellular animalcules, then single cells can have it, and analogy should make us ascribe it to the several cells of the brain, each individually taken. And what a convenience would it not be for the psychologist if, by the adding together of various doses of this separate-cell-consciousness, he could treat thought as a kind of stuff or material, to be measured out in great or small amount, increased and subtracted from, and baled about at will! He feels an imperious craving to be allowed to *construct* synthetically the successive mental states which he describes. The mind-stuff theory so easily admits of the construction being made, that it seems certain that 'man's unconquerable mind' will devote much future pertinacity and ingenuity to setting it on its legs again and getting it into some sort of plausible working-order. I will therefore conclude the chapter with some consideration of the remaining difficulties which beset the matter as it at present stands.

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DIFFICULTY OF STATING THE CONNECTION BETWEEN MIND AND BRAIN.

It will be remembered that in our criticism of the theory of the integration of successive conscious units into a feeling of musical pitch, we decided that whatever integration there was was that of the air-pulses into a simpler and simpler sort of physical effect, as the propagations of material change got higher and higher in the nervous system. At last, we said ([p. 23](#)), there results some simple and massive process in the auditory centres of the hemispherical cortex, to which, *as a whole*, the feeling of musical pitch directly corresponds. Already, in discussing the localization of functions in the brain, I had said ([pp. 158-9](#)) that consciousness accompanies the stream of innervation through that organ and varies in quality with the character of the currents, being mainly of things seen if the occipital lobes are much involved, of things heard if the action is focalized in the temporal lobes, etc., etc.; and I had added that a vague formula like this was as much as one could safely venture on in the actual state of physiology. The facts of mental deafness and blindness, of auditory and optical aphasia, show us that the whole brain must act together if certain thoughts are to occur. The consciousness, which is itself an integral thing not made of parts, 'corresponds' to the entire activity of the brain, whatever that may be, at the moment. This is a way of expressing the relation of mind and brain from which I shall not depart during the remainder of the book, because it expresses the bare phenomenal fact with no hypothesis, and is exposed to no such logical objections as we have found to cling to the theory of ideas in combination.

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Nevertheless, this formula which is so unobjectionable if taken vaguely, positivistically, or scientifically, as a mere empirical law of concomitance between our thoughts and our brain, tumbles to pieces entirely if we assume to represent anything more intimate or ultimate by it. The ultimate of ultimate problems, of course, in the study of the relations of thought and brain, is to understand why and how such disparate things are connected at all. But before that problem is solved (if it ever is solved) there is a less ultimate problem which must first be settled. Before the connection of thought and brain can be explained, it must at least be *stated* in an elementary form; and there are great difficulties about so stating it. To state it in elementary form one must reduce it to its lowest terms and know which mental fact and which cerebral fact are, so to speak, in immediate juxtaposition. We must find the minimal mental fact whose being reposes directly on a brain-fact; and we must similarly find the minimal brain-event which will have a mental counterpart at all. Between the mental and the physical minima thus found there will be an immediate relation, the expression of which, if we had it, would be the elementary psycho-physic law.

Our own formula escapes the unintelligibility of psychic atoms by *taking the entire thought* (even of a complex object) *as the minimum with which it deals on the mental side*. But in taking the entire brain-process as its minimal fact on the material side it confronts other difficulties almost as bad.

In the first place, it ignores analogies on which certain critics will insist, those, namely, [Pg 178] between the composition of the total brain-process and that of the *object* of the thought. The total brain-process is composed of parts, of simultaneous processes in the seeing, the hearing, the feeling, and other centres. The object thought of is also composed of parts, some of which are seen, others heard, others perceived by touch and muscular manipulation. "How then," these critics will say, "should the thought not itself be composed of parts, each the counterpart of a part of the object and of a part of the brain-process?" So natural is this way of looking at the matter that it has given rise to what is on the whole the most flourishing of all psychological systems—that of the Lockian school of associated ideas—of which school the mind-stuff theory is nothing but the last and subtlest offshoot.

The second difficulty is deeper still. *The 'entire brain-process' is not a physical fact at all*. It is the appearance to an onlooking mind of a multitude of physical facts. 'Entire brain' is nothing but our name for the way in which a million of molecules arranged in certain positions may affect our sense. On the principles of the corpuscular or mechanical philosophy, the only realities are the separate molecules, or at most the cells. Their aggregation into a 'brain' is a fiction of popular speech. Such a fiction cannot serve as the objectively real counterpart to any psychic state whatever. Only a genuinely physical fact can so serve. But the molecular fact is the only genuine physical fact—whereupon we seem, if we are to have an elementary psycho-physic law at all, thrust right back upon something like the mind-stuff theory, for the molecular fact, being an element of the 'brain,' would seem naturally to correspond, not to the total thoughts, but to elements in the thought.

What shall we do? Many would find relief at this point in celebrating the mystery of the Unknowable and the 'awe' which we should feel at having such a principle to take final charge of our perplexities. Others would rejoice that the finite and separatist view of things with which we started had at last developed its contradictions, and was about to lead us [Pg 179] dialectically upwards to some 'higher synthesis' in which inconsistencies cease from troubling and logic is at rest. It may be a constitutional infirmity, but I can take no comfort in such devices for making a luxury of intellectual defeat. They are but spiritual chloroform. Better live on the ragged edge, better gnaw the file forever!

THE MATERIAL-MONAD THEORY.

The most rational thing to do is to suspect that there may be a third possibility, an alternative supposition which we have not considered. Now there *is* an alternative supposition—a

supposition moreover which has been frequently made in the history of philosophy, and which is freer from logical objections than either of the views we have ourselves discussed. It may be called the *theory of polyzoism or multiple monadism*; and it conceives the matter thus:

Every brain-cell has its own individual consciousness, which no other cell knows anything about, all individual consciousnesses being 'ejective' to each other. There is, however, among the cells one central or pontifical one to which *our* consciousness is attached. But the events of all the other cells physically influence this arch-cell; and through producing their joint effects on it, these other cells may be said to 'combine.' The arch-cell is, in fact, one of those 'external media' without which we saw that no fusion or integration of a number of things can occur. The physical modifications of the arch-cell thus form a sequence of results in the production whereof every other cell has a share, so that, as one might say, every other cell is represented therein. And similarly, the conscious correlates to these physical modifications form a sequence of thoughts or feelings, each one of which is, as to its substantive being, an integral and uncompounded psychic thing, but each one of which may (in the exercise of its *cognitive* function) be *aware of THINGS* many and complicated in proportion to the number of other cells that have helped to modify the central cell.

By a conception of this sort, one incurs neither of the internal contradictions which we found to beset the other two theories. One has no unintelligible self-combining of psychic units to account for on the one hand; and on the other hand, one need not treat as the physical counterpart of the stream of consciousness under observation, a 'total brain-activity' which is non-existent as a genuinely physical fact. But, to offset these advantages, one has physiological difficulties and improbabilities. There is no cell or group of cells in the brain of such anatomical or functional pre-eminence as to appear to be the keystone or centre of gravity of the whole system. And even if there were such a cell, the theory of multiple monadism would, in strictness of thought, have no right to stop at it and treat it as a unit. The cell is no more a unit, materially considered, than the total brain is a unit. It is a compound of molecules, just as the brain is a compound of cells and fibres. And the molecules, according to the prevalent physical theories, are in turn compounds of atoms. The theory in question, therefore, if radically carried out, must set up for its elementary and irreducible psycho-physic couple, not the cell and its consciousness, but the primordial and eternal atom and its consciousness. We are back at Leibnitzian monadism, and therewith leave physiology behind us and dive into regions inaccessible to experience and verification; and our doctrine, although not self-contradictory, becomes so remote and unreal as to be almost as bad as if it were. Speculative minds alone will take an interest in it; and metaphysics, not psychology, will be responsible for its career. That the career may be a successful one must be admitted as a possibility—a theory which Leibnitz, Herbart, and Lotze have taken under their protection must have some sort of a destiny.

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THE SOUL-THEORY.

But is this my last word? By no means. Many readers have certainly been saying to themselves for the last few pages: "Why on earth doesn't the poor man say *the Soul* and have done with it?" Other readers, of anti-spiritualistic training and prepossessions, advanced thinkers, or popular evolutionists, will perhaps be a little surprised to find this much-despised word now sprung upon them at the end of so physiological a train of thought. But the plain fact is that all the arguments for a 'pontifical cell' or an 'arch-monad' are also arguments for that well-known spiritual agent in which scholastic psychology and common-sense have always believed. And my only reason for beating the bushes so, and not bringing it in earlier as a possible solution of our difficulties, has been that by this procedure I might perhaps force some of these materialistic minds to feel the more strongly the logical respectability of the spiritualistic position. The fact is that one cannot afford to despise any of these great traditional objects of belief. Whether we realize it or not, there is always a

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great drift of reasons, positive and negative, towing us in their direction. If there be such entities as Souls in the universe, they may possibly be affected by the manifold occurrences that go on in the nervous centres. To the state of the entire brain at a given moment they may respond by inward modifications of their own. These changes of state may be pulses of consciousness, cognitive of objects few or many, simple or complex. The soul would be thus a medium upon which (to use our earlier phraseology) the manifold brain-processes *combine their effects*. Not needing to consider it as the 'inner aspect' of any arch-molecule or brain-cell, we escape that physiological improbability; and as its pulses of consciousness are unitary and integral affairs from the outset, we escape the absurdity of supposing feelings which exist separately and then 'fuse together' by themselves. The separateness is in the brain-world, on this theory, and the unity in the soul-world; and the only trouble that remains to haunt us is the metaphysical one of understanding how one sort of world or existent thing can affect or influence another at all. This trouble, however, since it also exists inside of both worlds, and involves neither physical improbability nor logical contradiction, is relatively small.

I confess, therefore, that to posit a soul influenced in some mysterious way by the brain-states and responding to them by conscious affections of its own, seems to me the line of least logical resistance, so far as we yet have attained.

If it does not strictly *explain* anything, it is at any rate less positively objectionable than either mind-stuff or a material-monad creed. *The bare PHENOMENON, however, the IMMEDIATELY KNOWN thing which on the mental side is in apposition with the entire brain-process is the state of consciousness and not the soul itself.* Many of the staunchest believers in the soul admit that we know it only as an inference from experiencing its *states*. In [Chapter X](#), accordingly, we must return to its consideration again, and *ask ourselves whether, after all, the ascertainment of a blank unmediated correspondence, term for term, of the succession of states of consciousness with the succession of total brain-processes, be not the simplest psycho-physic formula, and the last word of a psychology which contents itself with verifiable laws, and seeks only to be clear, and to avoid unsafe hypotheses.* Such a mere admission of the empirical parallelism will there appear the wisest course. By keeping to it, our psychology will remain positivistic and non-metaphysical; and although this is certainly only a provisional halting-place, and things must some day be more thoroughly thought out, we shall abide there in this book, and just as we have rejected mind-dust, we shall take no account of the soul. The spiritualistic reader may nevertheless believe in the soul if he will; whilst the positivistic one who wishes to give a tinge of mystery to the expression of his positivism can continue to say that nature in her unfathomable designs has mixed us of clay and flame, of brain and mind, that the two things hang indubitably together and determine each other's being, but how or why, no mortal may ever know.

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[160] Psychol. § 62.

[161] *Ibid.* § 272.

[162] Fragments of Science, 5th ed., p. 420.

[163] Belfast Address, 'Nature,' August 20, 1874, p. 318. I cannot help remarking that the disparity between motions and feelings on which these authors lay so much stress, is somewhat less absolute than at first sight it seems. There are categories common to the two worlds. Not only temporal succession (as Helmholtz admits, *Physiol. Optik*, p. 445), but such attributes as intensity, volume, simplicity or complication, smooth or impeded change, rest or agitation, are habitually predicated of both physical facts and mental facts. Where such analogies obtain, the things do have something in common.

[164] Psychology, § 131

[165] 'Nature,' as above, 317-8.

[166] 'Nascent' is Mr. Spencer's great word. In showing how at a certain point consciousness must appear upon the evolving scene this author fairly outdoes himself in vagueness.

"In its higher forms, Instinct is probably accompanied by a rudimentary consciousness. There cannot be co-ordination of many stimuli without some ganglion through which they are all brought into relation. In the process of bringing them into relation, this ganglion must be subject to the influence of each—must undergo many changes. And the quick succession of changes in a ganglion, implying as it does perpetual experiences of differences and likenesses, constitutes the *raw material* of consciousness. The *implication* is that as fast as Instinct is developed, some kind of consciousness becomes nascent." (Psychology, § 195.)

The words 'raw material' and 'implication' which I have italicized are the words which do the *evolving*. They are supposed to have all the rigor which the 'synthetic philosophy' requires. In the following passage, when 'impressions' pass through a common 'centre of communication' in succession (much as people might pass into a theatre through a turnstile) consciousness, non-existent until then, is supposed to result:

"Separate impressions are received by the senses—by different parts of the body. If they go no further than the places at which they are received, they are useless. Or if only some of them are brought into relation with one another, they are useless. That an effectual adjustment may be made, they must be all brought into relation with one another. But this implies some centre of communication common to them all, through which they severally pass; and as they cannot pass through it simultaneously, they must pass through it in succession. So that as the external phenomena responded to become greater in number and more complicated in kind, the variety and rapidity of the changes to which this common centre of communication is subject must increase—there must result an unbroken series of these changes—*there must arise a consciousness*."

"Hence the progress of the correspondence between the organism and its environment necessitates a gradual reduction of the sensorial changes to a succession; and by so doing *evolves a distinct consciousness*—a consciousness that becomes higher as the succession becomes more rapid and the correspondence more complete." (*Ibid.* § 179.)

It is true that in the Fortnightly Review (vol. xiv, p. 716) Mr. Spencer denies that he means by this passage to tell us anything about the origin of consciousness at all. It resembles, however, too many other places in his Psychology (e.g. §§ 43, 110, 244) not to be taken as a serious attempt to explain how consciousness must at a certain point be 'evolved.' That, when a critic calls his attention to the inanity of his words, Mr. Spencer should say he never meant anything particular by them, is simply an example of the scandalous vagueness with which this sort of 'chromo-philosophy' is carried on.

[167] His own words are: "Mistakes are made in the sense that he admits having been touched, when in reality it was radiant heat that affected his skin. In our own before-mentioned experiments there was never any deception on the entire palmar side of the hand or on the face. On the back of the hand in one case in a series of 60 stimulations 4 mistakes occurred, in another case 2 mistakes in 45 stimulations. On the extensor side of the upper arm 3 deceptions out of 48 stimulations were noticed, and in the case of another individual, 1 out of 31. In one case over the spine 3 deceptions in a series of 11 excitations were observed; in another, 4 out of 19. On the lumbar spine 6 deceptions came among 29 stimulations, and again 4 out of 7. There is certainly not yet enough material on

which to rest a calculation of probabilities, but any one can easily convince himself that on the back there is no question of even a moderately accurate discrimination between warmth and a light pressure so far as but small portions of skin come into play. It has been as yet impossible to make corresponding experiments with regard to sensibility to cold." (Lehrb. d. Anat. u. Physiol. d. Sinnesorgane (1862), p. 29.)

[168] Principles of Psychology, § 60.

[169] Oddly enough, Mr. Spencer seems quite unaware of the *general* function of the theory of elementary units of mind-stuff in the evolutionary philosophy. We have seen it to be absolutely indispensable, if that philosophy is to work, to postulate consciousness in the nebula,—the simplest way being, of course, to suppose every atom animated. Mr. Spencer, however, will have it (e.g. First Principles, § 71) that consciousness is only the occasional result of the 'transformation' of a certain amount of 'physical force' to which it is 'equivalent.' Presumably a brain must already be there before any such 'transformation' can take place; and so the argument quoted in the text stands as a mere local detail, without general bearings.

[170] The compounding of colors may be dealt with in an identical way. Helmholtz has shown that if green light and red light fall simultaneously on the retina, we see the color yellow. The mind-stuff theory would interpret this as a case where the feeling green and the feeling red 'combine' into the *tertium quid* of feeling, yellow. What really occurs is no doubt that a third kind of nerve-process is set up when the combined lights impinge on the retina,—not simply the process of red plus the process of green, but something quite different from both or either. Of course, then, there *are* no feelings, either of red or of green, present to the mind at all; but the feeling of yellow which *is* there, answers as directly to the nerve-process which momentarily then exists, as the feelings of green and red would answer to their respective nerve-processes did the latter happen to be taking place.

[171] Cf. Mill's Logic, book vi, chap. iv, § 3.

[172] I find in my students an almost invincible tendency to think that we can immediately perceive that feelings do combine. "What!" they say, "is not the taste of lemonade composed of that of lemon *plus* that of sugar?" This is taking the combining of objects for that of feelings. The physical lemonade contains both the lemon and the sugar, but its taste does not contain their tastes, for if there are any two things which are certainly *not* present in the taste of lemonade, those are the lemon-sour on the one hand and the sugar-sweet on the other. These tastes are absent utterly. The entirely new taste which is present *resembles*, it is true, both those tastes; but in [Chapter XIII](#) we shall see that resemblance can not always be held to involve partial identity.

[173] E. Montgomery, in 'Mind,' v, 18-19. See also [pp. 24-5](#).

[174] J. Royce, 'Mind,' vi, p. 376. Lotze has set forth the truth of this law more clearly and copiously than any other writer. Unfortunately he is too lengthy to quote. See his Microcosmus, bk. ii, ch. i, § 5; Metaphysik, §§ 242, 260; Outlines of Metaphysics, part ii, chap. i, §§ 3, 4, 5. Compare also Reid's Intellectual Powers, essay v, chap. iii, *ad fin.*; Bowne's Metaphysics, pp. 361-76; St. J. Mivart: Nature and Thought, pp. 98-101; E. Gurney: 'Monism,' in 'Mind,' vi, 153; and the article by Prof. Royce, just quoted, on 'Mind-stuff and Reality.'

In defence of the mind-stuff view, see W. K. Clifford: 'Mind,' iii, 57 (reprinted in his 'Lectures and Essays,' ii, 71); G. T. Fechner, Psychophysik, Bd. ii, cap. xlv; H. Taine: on Intelligence, bk. iii; E. Haeckel: 'Zellseelen u. Seelenzellen' in Gesammelte pop. Vorträge, Bd. i, p. 143; W. S. Duncan: Conscious Matter, *passim*; H. Zöllner: Natur d. Cometen, pp. 320 ff.; Alfred Barratt: 'Physical Ethic' and 'Physical Metempiric,' *passim*; J. Soury: 'Hylozoismus,' in 'Kosmos,' V. Jahrg., Heft x, p. 241; A. Main: 'Mind,' i, 292, 431, 566; ii, 129, 402; *Id.* Revue

Philos., ii, 86, 88, 419; iii, 51, 502; iv, 402; F. W. Frankland: 'Mind,' vi, 116; Whittaker: 'Mind,' vi, 498 (historical); Morton Prince: *The Nature of Mind and Human Automatism* (1885); A. Riehl: *Der philosophische Kriticismus*, Bd. ii, Theil 2, 2ter Abschnitt, 2tes Cap. (1887). The clearest of all these Statements is, as far as it goes, that of Prince.

[175] "Someone might say that although it is true that neither a blind man nor a deaf man by himself can compare sounds with colors, yet since one hears and the other sees they might do so both together.... But whether they are apart or close together makes no difference; not even if they permanently keep house together; no, not if they were Siamese twins, or more than Siamese twins, and were inseparably grown together, would it make the assumption any more possible. Only when sound and color are represented in the same reality is it thinkable that they should be compared." (Brentano: *Psychologie*, p. 209.)

[176] The reader must observe that we are reasoning altogether about the *Logic* of the mind-stuff theory, about whether it can *exist in the constitution* of higher mental states by viewing them as *identical with lower ones* summed together. We say the two sorts of fact are not identical: a higher state *is* not a lot of lower states; it is itself. When, however, a lot of lower states have come together, or when certain brain-conditions occur together which, *if they occurred separately, would produce* a lot of lower states, we have not for a moment pretended that a higher state may not emerge. In fact it does emerge under those conditions; and our [Chapter IX](#) will be mainly devoted to the proof of this fact. But such emergence is that of a new psychic entity, and is *toto cælo* different from such an 'integration' of the lower states as the mind-stuff theory affirms.

It may seem strange to suppose that anyone should mistake criticism of a certain theory about a fact for doubt of the fact itself. And yet the confusion is made in high quarters enough to justify our remarks. Mr. J. Ward, in his article *Psychology* in the *Encyclopædia Britannica*, speaking of the hypothesis that "a series of feelings can be aware of itself as a series," says (p. 39): "Paradox is too mild a word for it, even contradiction will hardly suffice." Whereupon, Professor Bain takes him thus to task: "As to 'a series of states being aware of itself,' I confess I see no insurmountable difficulty. It may be a fact, or not a fact; it may be a very clumsy expression for what it is applied to; but it is neither paradox nor contradiction. A series merely contradicts an individual, or it may be two or more individuals as coexisting; but that is too general to exclude the possibility of self-knowledge. It certainly does not bring the property of self-knowledge into the foreground, which, however, is not the same as denying it. An algebraic series might know itself, without any contradiction: the only thing against it is the want of evidence of the fact." ('Mind,' xi, 459). Prof. Bain thinks, then, that all the bother is about the difficulty of seeing how a series of feelings can have the knowledge of itself *added to it!!!* As if anybody ever was troubled about that. That, notoriously enough, is a fact: our consciousness is a series of feelings to which every now and then is *added* a retrospective consciousness that they have come and gone. What Mr. Ward and I are troubled about is merely the silliness of the mind-stuffists and associationists continuing to say that the 'series of states' is the 'awareness of itself;' that if the states be posited severally, their collective consciousness is *eo ipso* given; and that we need no farther explanation, or 'evidence of the fact.'

[177] The writers about 'unconscious cerebration' seem sometimes to mean that and sometimes unconscious thought. The arguments which follow are culled from various quarters. The reader will find them most systematically urged by E. von Hartmann: *Philosophy of the Unconscious*, vol. i; and by E. Colsonet: *La Vie Inconsciente de l'Esprit* (1880). Consult also T. Laycock: *Mind and Brain*, vol. i, chap. v (1860); W. B. Carpenter: *Mental Physiology*, chap. xiii; F. P. Cobbe: *Darwinism in Morals and other Essays*, essay xi, *Unconscious Cerebration*

(1872); F. Bowen: *Modern Philosophy*, pp. 428-480; R. H. Hutton: *Contemporary Review*, vol. xxiv, p. 201; J. S. Mill: *Exam. of Hamilton*, chap. xv; G. H. Lewes: *Problems of Life and Mind*, 3d series, Prob. ii, chap. x, and also Prob. iii, chap. ii; D. G. Thompson: *A System of Psychology*, chap. xxxiii; J. M. Baldwin, *Handbook of Psychology*, chap. iv.

- [178] *Nouveaux Essais*, Avant-propos.
- [179] J. S. Mill, *Exam. of Hamilton*, chap. xv.
- [180] Cf. Dugald Stewart, *Elements*, chap. ii.
- [181] J. E. Maude: 'The Unconscious in Education,' in 'Education,' vol. i, p. 401 (1882).
- [182] *Zur Lehre vor Lichtsinne* (1878).
- [183] Cf. Wundt: *Ueber den Einfluss der Philosophie*, etc.—*Antrittsrede* (1876), pp. 10-11;—Helmholtz: *Die Thatsachen in der Wahrnehmung* (1879), p. 27.
- [184] Cf. *Satz vom Grunde*, pp. 59-65. Compare also F. Zöllner's *Natur der Kometen*, pp. 342 ff. and 425.
- [185] Cf. the statements from Helmholtz to be found later in [Chapter XIII](#).
- [186] The text was written before Professor Lipps's *Grundtatsachen des Seelenlebens* (1883) came into my hands. In Chapter III of that book the notion of unconscious thought is subjected to the clearest and most searching criticism which it has yet received. Some passages are so similar to what I have myself written that I must quote them in a note. After proving that dimness and clearness, incompleteness and completeness do not pertain to a state of mind *as such*—since every state of mind must be *exactly* what it is, and nothing else—but only pertain to the way in which states of mind stand for objects, which they more or less dimly, more or less clearly, *represent*; Lipps takes the case of those sensations which attention is said to make more clear. "I perceive an object," he says, "now in clear daylight, and again at night. Call the content of the day-perception *a*, and that of the evening-perception *a*^l. There will probably be a considerable difference between *a* and *a*^l. The colors of *a* will be varied and intense, and will be sharply bounded by each other; those of *a*^l will be less luminous, and less strongly contrasted, and will approach a common gray or brown, and merge more into each other. Both percepts, however, as such, are completely determinate and distinct from all others. The colors of *a*^l appear before my eye neither more nor less decidedly dark and blurred than the colors of *a* appear bright and sharply bounded. But now I know, or believe I know, that one and the same real Object A corresponds to both *a* and *a*^l. I am convinced, moreover, that *a* represents A better than does *a*^l. Instead, however, of giving to my conviction this, its only correct, expression, and keeping the content of my consciousness and the real object, the representation and what it means, distinct from each other, I substitute the real object for the content of the consciousness, and talk of the experience as if it consisted in one and the same object (namely, the surreptitiously introduced real one), constituting twice over the content of my consciousness, once in a clear and distinct, the other time in an obscure and vague fashion. I talk now of a distincter and of a less distinct *consciousness* of A, whereas I am only justified in talking of two consciousnesses, *a* and *a*^l, equally distinct *in se*, but to which the supposed external object A corresponds with different degrees of distinctness." (P. 38-9.)

We have now finished the physiological preliminaries of our subject and must in the remaining chapters study the mental states themselves whose cerebral conditions and concomitants we have been considering hitherto. Beyond the brain, however, there is an outer world to which the brain-states themselves 'correspond.' And it will be well, ere we advance farther, to say a word about the relation of the mind to this larger sphere of physical fact.

PSYCHOLOGY IS A NATURAL SCIENCE.

That is, the mind which the psychologist studies is the mind of distinct individuals inhabiting definite portions of a real space and of a real time. With any other sort of mind, absolute Intelligence, Mind unattached to a particular body, or Mind not subject to the course of time, the psychologist as such has nothing to do. 'Mind,' in his mouth, is only a class name for *minds*. Fortunate will it be if his more modest inquiry result in any generalizations which the philosopher devoted to absolute Intelligence as such can use.

To the psychologist, then, the minds he studies are *objects*, in a world of other objects. Even when he introspectively analyzes his own mind, and tells what he finds there, he talks about it in an objective way. He says, for instance, that under certain circumstances the color gray appears to him green, and calls the appearance an illusion. This implies that he compares two objects, a real color seen under certain conditions, and a mental perception which he believes to represent it, and that he declares the relation between them to be of a certain kind. In making this critical judgment, the psychologist stands as much outside of the perception which he criticises as he does of the color. Both are his objects. And if this is true of him when he reflects on his own conscious states, how much truer is it when he treats of those of others! In German philosophy since Kant the word *Erkenntnisstheorie*, criticism of the faculty of knowledge, plays a great part. Now the psychologist necessarily becomes such an *Erkenntnisstheoretiker*. But the knowledge he theorizes about is not the bare function of knowledge which Kant criticises—he does not inquire into the possibility of knowledge *überhaupt*. He assumes it to be possible, he does not doubt its presence in himself at the moment he speaks. The knowledge he criticises is the knowledge of particular men about the particular things that surround them. This he may, upon occasion, in the light of his *own* unquestioned knowledge, pronounce true or false, and trace the reasons by which it has become one or the other.

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It is highly important that this natural-science point of view should be understood at the outset. Otherwise more may be demanded of the psychologist than he ought to be expected to perform.

A diagram will exhibit more emphatically what the assumptions of Psychology must be:

1. The Psychologist	2. The Thought Studied	3. The Thought's Object	4. The Psychologist's Reality
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These four squares contain the irreducible data of psychology. No. 1, the psychologist, believes Nos. 2, 3, and 4, which together form *his* total object, to be realities, and reports them and their mutual relations as truly as he can without troubling himself with the puzzle of how he can report them at all. About such *ultimate* puzzles he in the main need trouble himself no more than the geometer, the chemist, or the botanist do, who make precisely the same assumptions as he. ^[187]

Of certain fallacies to which the psychologist is exposed by reason of his peculiar point of view—that of being a reporter of subjective as well as of objective facts, we must presently speak. But not until we have considered the methods he uses for ascertaining what the facts in question are.

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THE METHODS OF INVESTIGATION.

Introspective Observation is what we have to rely on first and foremost and always. The word introspection need hardly be defined—it means, of course, the looking into our own minds and reporting what we there discover. *Every one agrees that we there discover states of consciousness.* So far as I know, the existence of such states has never been doubted by any critic, however sceptical in other respects he may have been. That we have *cogitations* of some sort is the *inconcussum* in a world most of whose other facts have at some time tottered in the breath of philosophic doubt. All people unhesitatingly believe that they feel themselves thinking, and that they distinguish the mental state as an inward activity or passion, from all the objects with which it may cognitively deal. *I regard this belief as the most fundamental of all the postulates of Psychology,* and shall discard all curious inquiries about its certainty as too metaphysical for the scope of this book.

A Question of Nomenclature. We ought to have some general term by which to designate all states of consciousness merely as such, and apart from their particular quality or cognitive function. Unfortunately most of the terms in use have grave objections. 'Mental state,' 'state of consciousness,' 'conscious modification,' are cumbrous and have no kindred verbs. The same is true of 'subjective condition.' 'Feeling' has the verb 'to feel,' both active and neuter, and such derivatives as 'feelingly,' 'felt,' 'feltness,' etc., which make it extremely convenient. But on the other hand it has specific meanings as well as its generic one, sometimes standing for pleasure and pain, and being sometimes a synonym of '*sensation*' as opposed to *thought*; whereas we wish a term to cover sensation and thought indifferently. Moreover, 'feeling' has acquired in the hearts of platonizing thinkers a very opprobrious set of implications; and since one of the great obstacles to mutual understanding in philosophy is the use of words eulogistically and disparagingly, impartial terms ought always, if possible, to be preferred. The word *psychosis* has been proposed by Mr. Huxley. It has the advantage of being correlative to *neurosis* (the name applied by the same author to the corresponding nerve-process), and is moreover technical and devoid of partial implications. But it has no verb or other grammatical form allied to it. The expressions 'affection of the soul,' 'modification of the ego,' are clumsy, like 'state of consciousness,' and they implicitly assert theories which it is not well to embody in terminology before they have been openly discussed and approved. 'Idea' is a good vague neutral word, and was by Locke employed in the broadest generic way; but notwithstanding his authority it has not domesticated itself in the language so as to cover bodily sensations, and it moreover has no verb. 'Thought' would be by far the best word to use if it could be made to cover sensations. It has no opprobrious connotation such as 'feeling' has, and it immediately suggests the omnipresence of cognition (or reference to an object other than the mental state itself), which we shall soon see to be of the mental life's essence. But can the expression 'thought of a toothache' ever suggest to the reader the actual present pain itself? It is hardly possible; and we thus seem about to be forced back on some *pair* of terms like Hume's 'impression and idea,' or Hamilton's 'presentation and representation,' or the ordinary 'feeling and thought,' if we wish to cover the whole ground.

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In this quandary we can make no definitive choice, but must, according to the convenience of the context, use sometimes one, sometimes another of the synonyms that have been mentioned. *My own partiality is for either FEELING OR THOUGHT.* I shall probably often use both words in a wider sense than usual, and alternately startle two classes of readers by their unusual sound; but if the connection makes it clear that mental states at large, irrespective of their kind, are meant, this will do no harm, and may even do some good. ^[188]

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The inaccuracy of introspective observation has been made a subject of debate. It is important to gain some fixed ideas on this point before we proceed.

The commonest spiritualistic opinion is that the Soul or *Subject* of the mental life is a metaphysical entity, inaccessible to direct knowledge, and that the various mental states and operations of which we reflectively become aware are objects of an inner sense which does not lay hold of the real agent in itself, any more than sight or hearing gives us direct knowledge of matter in itself. From, this point of view introspection is, of course, incompetent to lay hold of anything more than the Soul's *phenomena*. But even then the question remains, How well can it know the phenomena themselves?

Some authors take high ground here and claim for it a sort of infallibility. Thus Ueberweg:

"When a mental image, as such, is the object of my apprehension, there is no meaning in seeking to distinguish its existence in my consciousness (in me) from its existence out of my consciousness (in itself); for the object apprehended is, in this case, one which does not even exist, as the objects of external perception do, in itself outside of my consciousness. It exists only within me."^[189]

And Brentano:

"The phenomena inwardly apprehended are true in themselves. As they appear —of this the evidence with which they are apprehended is a warrant—so they are in reality. Who, then, can deny that in this a great superiority of Psychology over the physical sciences comes to light?"

And again:

"No one can doubt whether the psychic condition he apprehends in himself *be*, and *be so*, as he apprehends it. Whoever should doubt this would have reached that *finished* doubt which destroys itself in destroying every fixed point from which to make an attack upon knowledge."^[190]

Others have gone to the opposite extreme, and maintained that we can have no introspective cognition of our own minds at all. A deliverance of Auguste Comte to this effect has been so often quoted as to be almost classical; and some reference to it seems therefore indispensable here.

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Philosophers, says Comte,^[191] have

"in these latter days imagined themselves able to distinguish, by a very singular subtlety, two sorts of observation of equal importance, one external, the other internal, the latter being solely destined for the study of intellectual phenomena.... I limit myself to pointing out the principal consideration which proves clearly that this pretended direct contemplation of the mind by itself is a pure illusion.... It is in fact evident that, by an invincible necessity, the human mind can observe directly all phenomena except its own proper states. For by whom shall the observation of these be made? It is conceivable that a man might observe himself with respect to the *passions* that animate him, for the anatomical organs of passion are distinct from those whose function is observation. Though we have all made such observations on ourselves, they can never have much scientific value, and the best mode of knowing the passions will always be that of observing them from without; for every strong state of passion ... is necessarily incompatible with the state of observation. But, as for observing in the same way *intellectual* phenomena at the time of their actual

presence, that is a manifest impossibility. The thinker cannot divide himself into two, of whom one reasons whilst the other observes him reason. The organ observed and the organ observing being, in this case, identical, how could observation take place? This pretended psychological method is then radically null and void. On the one hand, they advise you to isolate yourself, as far as possible, from every external sensation, especially every intellectual work,—for if you were to busy yourself even with the simplest calculation, what would become of *internal* observation?—on the other hand, after having with the utmost care attained this state of intellectual slumber, you must begin to contemplate the operations going on in your mind, when nothing there takes place! Our descendants will doubtless see such pretensions some day ridiculed upon the stage. The results of so strange a procedure harmonize entirely with its principle. For all the two thousand years during which metaphysicians have thus cultivated psychology, they are not agreed about one intelligible and established proposition. '*Internal observation*' gives almost as many divergent results as there are individuals who think they practise it."

Comte hardly could have known anything of the English, and nothing of the German, empirical psychology. The 'results' which he had in mind when writing were probably scholastic ones, such as principles of internal activity, the faculties, the ego, the *liberum arbitrium indifferentiae*, etc. John Mill, in replying to him,^[192] says:

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"It might have occurred to M. Comte that a fact may be studied through the medium of memory, not at the very moment of our perceiving it, but the moment after: and this is really the mode in which our best knowledge of our intellectual acts is generally acquired. We reflect on what we have been doing when the act is past, but when its impression in the memory is still fresh. Unless in one of these ways, we could not have acquired the knowledge which nobody denies us to have, of what passes in our minds. M. Comte would scarcely have affirmed that we are not aware of our own intellectual operations. We know of our observings and our reasonings, either at the very time, or by memory the moment after; in either case, by direct knowledge, and not (like things done by us in a state of somnambulism) merely by their results. This simple fact destroys the whole of M. Comte's argument. Whatever we are directly aware of, we can directly observe."

Where now does the truth lie? Our quotation from Mill is obviously the one which expresses the most of *practical* truth about the matter. Even the writers who insist upon the absolute veracity of our immediate inner apprehension of a conscious state have to contrast with this the fallibility of our *memory* or *observation* of it, a moment later. No one has emphasized more sharply than Brentano himself the difference between the immediate *feltness* of a feeling, and its perception by a subsequent reflective act. But which mode of consciousness of it is that which the psychologist must depend on? If to *have* feelings or thoughts in their immediacy were enough, babies in the cradle would be psychologists, and infallible ones. But the psychologist must not only *have* his mental states in their absolute veritableness, he must report them and write about them, name them, classify and compare them and trace their relations to other things. Whilst alive they are their own property; it is only *post-mortem* that they become his prey.^[193] And as in the naming, classing, and knowing of things in general we are notoriously fallible, why not also here? Comte is quite right in laying stress on the fact that a feeling, to be named, judged, or perceived, must be already past. No subjective state, whilst present, is its own object; its object is always something else. There are, it is true, cases in which we appear to be naming our present feeling, and so to be experiencing and observing the same inner fact at a single stroke, as when we say 'I feel tired,' 'I am angry,' etc. But these are illusory, and a little attention unmask the illusion.

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The present conscious state, when I say 'I feel tired,' is not the direct state of tire; when I say 'I feel angry,' it is not the direct state of anger. It is the state of *saying-I-feel-tired*, of *saying-I-feel-angry*,—entirely different matters, so different that the fatigue and anger apparently included in them are considerable modifications of the fatigue and anger directly felt the previous instant. The act of naming them has momentarily detracted from their force.^[194]

The only sound grounds on which the infallible veracity of the introspective judgment might be maintained are empirical. If we had reason to think it has never yet deceived us, we might continue to trust it. This is the ground actually maintained by Herr Mohr.

"The illusions of our senses," says this author, "have undermined our belief in the reality of the outer world; but in the sphere of inner observation our confidence is intact, for we have never found ourselves to be in error about the reality of an act of thought or feeling. We have never been misled into thinking we were *not* in doubt or in anger when these conditions were really states of our consciousness."^[195]

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But sound as the reasoning here would be, were the premises correct, I fear the latter cannot pass. However it may be with such strong feelings as doubt or anger, about weaker feelings, and about the *relations to each other* of all feelings, we find ourselves in continual error and uncertainty so soon as we are called on to name and class, and not merely to feel. Who can be sure of the exact *order* of his feelings when they are excessively rapid? Who can be sure, in his sensible perception of a chair, how much comes from the eye and how much is supplied out of the previous knowledge of the mind? Who can compare with precision the *quantities* of disparate feelings even where the feelings are very much alike? For instance, where an object is felt now against the back and now against the cheek, which feeling is most extensive? Who can be sure that two given feelings are or are not exactly the same? Who can tell which is briefer or longer than the other when both occupy but an instant of time? Who knows, of many actions, for what motive they were done, or if for any motive at all? Who can enumerate all the distinct ingredients of such a complicated feeling as *anger*? and who can tell off-hand whether or no a perception of *distance* be a compound or a simple state of mind? The whole mind-stuff controversy would stop if we could decide conclusively by introspection that what seem to us elementary feelings are really elementary and not compound.

Mr. Sully, in his work on Illusions, has a chapter on those of Introspection from which we might now quote. But, since the rest of this volume will be little more than a collection of illustrations of the difficulty of discovering by direct introspection exactly what our feelings and their relations are, we need not anticipate our own future details, I but just state our general conclusion that *introspection is difficult and fallible; and that the difficulty is simply that of all observation of whatever kind*. Something is before us; we do our best to tell what it is, but in spite of our good will we may go astray, and give a description more applicable to some other sort of thing. The only safeguard is in the final *consensus* of our farther knowledge about the thing in question, later views correcting earlier ones, until at last the harmony of a consistent system is reached. Such a system, gradually worked out, is the best guarantee the psychologist can give for the soundness of any particular psychologic observation which he may report. Such a system we ourselves must strive, as far as may be, to attain.

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The English writers on psychology, and the school of Herbart in Germany, have in the main contented themselves with such results as the immediate introspection of single individuals gave, and shown what a body of doctrine they may make. The works of Locke, Hume, Reid, Hartley, Stewart, Brown, the Mills, will always be classics in this line; and in Professor Bain's Treatises we have probably the last word of what this method taken mainly by itself

can do—the last monument of the youth of our science, still untechnical and generally intelligible, like the Chemistry of Lavoisier, or Anatomy before the microscope was used.

The Experimental Method. But psychology is passing into a less simple phase. Within a few years what one may call a microscopic psychology has arisen in Germany, carried on by experimental methods, asking of course every moment for introspective data, but eliminating their uncertainty by operating on a large scale and taking statistical means. This method taxes patience to the utmost, and could hardly have arisen in a country whose natives could be *bored*. Such Germans as Weber, Fechner, Vierordt, and Wundt obviously cannot; and their success has brought into the field an array of younger experimental psychologists, bent on studying the *elements* of the mental life, dissecting them out from the gross results in which they are embedded, and as far as possible reducing them to quantitative scales. The simple and open method of attack having done what it can, the method of patience, starving out, and harassing to death is tried; the Mind must submit to a regular *siege*, in which minute advantages gained night and day by the forces that hem her in must sum themselves up at last into her overthrow. There is little of the grand style about these new prism, pendulum, and chronograph-philosophers. They mean business, not chivalry. What generous divination, and that superiority in virtue which was thought by Cicero to give a man the best insight into nature, have failed to do, their spying and scraping, their deadly tenacity and almost diabolic cunning, will doubtless some day bring about.

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No general description of the methods of experimental psychology would be instructive to one unfamiliar with the instances of their application, so we will waste no words upon the attempt. *The principal fields of experimentation* so far have been: 1) the connection of conscious states with their physical conditions, including the whole of brain-physiology, and the recent minutely cultivated physiology of the sense-organs, together with what is technically known as 'psycho-physics,' or the laws of correlation between sensations and the outward stimuli by which they are aroused; 2) the analysis of space-perception into its sensational elements; 3) the measurement of the *duration* of the simplest mental processes; 4) that of the *accuracy of reproduction* in the memory of sensible experiences and of intervals of space and time; 5) that of the manner in which simple mental states *influence each other*, call each other up, or inhibit each other's reproduction; 6) that of the *number of facts* which consciousness can simultaneously discern; finally, 7) that of the elementary laws of oblivescence and retention. It must be said that in some of these fields the results have as yet borne little theoretic fruit commensurate with the great labor expended in their acquisition. But facts are facts, and if we only get enough of them they are sure to combine. New ground will from year to year be broken, and theoretic results will grow. Meanwhile the experimental method has quite changed the face of the science so far as the latter is a record of mere work done.

The comparative method, finally, supplements the introspective and experimental methods. This method presupposes a normal psychology of introspection to be established in its main features. But where the origin of these features, or their dependence upon one another, is in question, it is of the utmost importance to trace the phenomenon considered through all its possible variations of type and combination. So it has come to pass that instincts of animals are ransacked to throw light on our own; and that the reasoning faculties of bees and ants, the minds of savages, infants, madmen, idiots, the deaf and blind, criminals, and eccentrics, are all invoked in support of this or that special theory about some part of our own mental

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life. The history of sciences, moral and political institutions, and languages, as types of mental product, are pressed into the same service. Messrs. Darwin and Galton have set the example of circulars of questions sent out by the hundred to those supposed able to reply. The custom has spread, and it will be well for us in the next generation if such circulars be not ranked among the common pests of life. Meanwhile information grows, and results emerge. There are great sources of error in the comparative method. The interpretation of the 'psychoses' of animals, savages, and infants is necessarily wild work, in which the personal equation of the investigator has things very much its own way. A savage will be reported to have no moral or religious feeling if his actions shock the observer unduly. A child will be assumed without self-consciousness because he talks of himself in the third person, etc., etc. No rules can be laid down in advance. Comparative observations, to be definite, must usually be made to test some pre-existing hypothesis; and the only thing then is to use as much sagacity as you possess, and to be as candid as you can.

THE SOURCES OF ERROR IN PSYCHOLOGY.

The first of them arises from the Misleading Influence of Speech. Language was originally made by men who were not psychologists, and most men to-day employ almost exclusively the vocabulary of outward things. The cardinal passions of our life, anger, love, fear, hate, hope, and the most comprehensive divisions of our intellectual activity, to remember, expect, think, know, dream, with the broadest genera of æsthetic feeling, joy, sorrow, pleasure, pain, are the only facts of a subjective order which this vocabulary deigns to note by special words. The elementary qualities of sensation, bright, loud, red, blue, hot, cold, are, it is true, susceptible of being used in both an objective and a subjective sense. They stand for outer qualities and for the feelings which these arouse. But the objective sense is the original sense; and still to-day we have to describe a large number of sensations by the name of the object from which they have most frequently been got. An orange color, an odor of violets, a cheesy taste, a thunderous sound, a fiery smart, etc., will recall what I mean. This absence of a special vocabulary for subjective facts hinders the study of all but the very coarsest of them. Empiricist writers are very fond of emphasizing one great set of delusions which language inflicts on the mind. Whenever we have made a word, they say, to denote a certain group of phenomena, we are prone to suppose a substantive entity existing beyond the phenomena, of which the word shall be the name. But the *lack* of a word quite as often leads to the directly opposite error. We are then prone to suppose that no entity can be there; and so we come to overlook phenomena whose existence would be patent to us all, had we only grown up to hear it familiarly recognized in speech.^[196] It is hard to focus our attention on the nameless, and so there results a certain vacuousness in the descriptive parts of most psychologies.

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But a worse defect than vacuousness comes from the dependence of psychology on common speech. Naming our thought by its own objects, we almost all of us assume that as the objects are, so the thought must be. The thought of several distinct things can only consist of several distinct bits of thought, or 'ideas;' that of an abstract or universal object can only be an abstract or universal idea. As each object may come and go, be forgotten and then thought of again, it is held that the thought of it has a precisely similar independence, self-identity, and mobility. The thought of the object's recurrent identity is regarded as the identity of its recurrent thought; and the perceptions of multiplicity, of coexistence, of succession, are severally conceived to be brought about only through a multiplicity, a coexistence, a succession, of perceptions. The continuous flow of the mental stream is sacrificed, and in its place an atomism, a brickbat plan of construction, is preached, for the existence of which no good introspective grounds can be brought forward, and out of which presently grow all sorts of paradoxes and contradictions, the heritage of woe of students of the mind.

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These words are meant to impeach the entire English psychology derived from Locke and Hume, and the entire German psychology derived from Herbart, so far as they both treat 'ideas' as separate subjective entities that come and go. Examples will soon make the matter clearer. Meanwhile our psychologic insight is vitiated by still other snares.

'*The Psychologist's Fallacy.*' The great snare of the psychologist is the *confusion of his own standpoint with that of the mental fact* about which he is making his report. I shall hereafter call this the 'psychologist's fallacy' *par excellence*. For some of the mischief, here too, language is to blame. The psychologist, as we remarked above (p. 183), stands outside of the mental state he speaks of. Both itself and its object are objects for him. Now when it is a *cognitive* state (percept, thought, concept, etc.), he ordinarily has no other way of naming it than as the thought, percept, etc., *of that object*. He himself, meanwhile, knowing the self-same object in *his* way, gets easily led to suppose that the thought, which is *of* it, knows it in the same way in which he knows it, although this is often very far from being the case.^[197] The most fictitious puzzles have been introduced into our science by this means. The so-called question of presentative or representative perception, of whether an object is present to the thought that thinks it by a counterfeit image of itself, or directly and without any intervening image at all; the question of nominalism and conceptualism, of the shape in which things are present when only a general notion of them is before the mind; are comparatively easy questions when once the psychologist's fallacy is eliminated from their treatment,—as we shall ere long see (in [Chapter XII](#)).

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Another variety of the psychologist's fallacy is the assumption that the mental state studied must be conscious of itself as the psychologist is conscious of it. The mental state is aware of itself only from within; it grasps what we call its own content, and nothing more. The psychologist, on the contrary, is aware of it from without, and knows its relations with all sorts of other things. What the thought sees is only its own object; what the psychologist sees is the thought's object, plus the thought itself, plus possibly all the rest of the world. We must be very careful therefore, in discussing a state of mind from the psychologist's point of view, to avoid foisting into its own ken matters that are only there for ours. We must avoid substituting what we know the consciousness *is*, for what it is a consciousness *of*, and counting its outward, and so to speak physical, relations with other facts of the world, in among the objects of which we set it down as aware. Crude as such a confusion of standpoints seems to be when abstractly stated, it is nevertheless a snare into which no psychologist has kept himself at all times from falling, and which forms almost the entire stock-in-trade of certain schools. We cannot be too watchful against its subtly corrupting influence.

Summary. To sum up the chapter, Psychology assumes that thoughts successively occur, and that they know objects in a world which the psychologist also knows. *These thoughts are the subjective data of which he treats, and their relations to their objects, to the brain, and to the rest of the world constitute the subject-matter of psychologic science.* Its methods are introspection, experimentation, and comparison. But introspection is no sure guide to truths *about* our mental states; and in particular the poverty of the psychological vocabulary leads us to drop out certain states from our consideration, and to treat others as if they knew themselves and their objects as the psychologist knows both, which is a disastrous fallacy in the science.

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[187] On the relation between Psychology and General Philosophy, see G. C. Robertson, 'Mind,' vol. viii, p. 1, and J. Ward, *ibid.* p. 153; J. Dewey *ibid.* vol. ix, p. 1.

[188] Compare some remarks in Mill's Logic, bk. i, chap. iii, §§ 2, 3.

- [189] Logic, § 40.
- [190] Psychologie, bk. ii, chap. iii, §§ 1, 2.
- [191] Cours de Philosophie Positive, i, 34-8.
- [192] Auguste Comte and Positivism, 3d edition (1882), p. 64.
- [193] Wundt says: "The first rule for utilizing inward observation consists in taking, as far as possible, experiences that are accidental, unexpected, and not intentionally brought about.... *First* it is best as far as possible to rely on *Memory* and not on immediate Apprehension.... *Second*, internal observation is better fitted to grasp clearly conscious states, especially voluntary mental acts: such inner processes as are obscurely conscious and involuntary will almost entirely elude it, because the effort to observe interferes with them, and because they seldom abide in memory." (Logik, ii, 432.)
- [194] In cases like this, where the state outlasts the act of naming it, exists before it, and recurs when it is past, we probably run little practical risk of error when we talk as if the state knew itself. The state of feeling and the state of naming the feeling are continuous, and the infallibility of such prompt introspective judgments is probably great. But even here the certainty of our knowledge ought not to be argued on the *a priori* ground that *percipi* and *esse* are in psychology the same. The states are really two; the naming state and the named state are apart; '*percipi* is *esse*' is not the principle that applies.
- [195] J. Mohr: Grundlage der Empirischen Psychologie (Leipzig, 1882), p. 47.
- [196] In English we have not even the generic distinction between the-thing-thought-of and the-thought-thinking-it, which in German is expressed by the opposition between *Gedachtes* and *Gedanke*, in Latin by that between *cogitatum* and *cogitatio*.
- [197] Compare B. P. Bowne's Metaphysics (1882), p. 408.

CHAPTER VIII.

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THE RELATIONS OF MINDS TO OTHER THINGS.

Since, for psychology, a mind is an object in a world of other objects, its relation to those other objects must next be surveyed. First of all, to its

TIME-RELATIONS.

Minds, as we know them, are temporary existences. Whether my mind had a being prior to the birth of my body, whether it shall have one after the latter's decease, are questions to be decided by my general philosophy or theology rather than by what we call 'scientific facts'— I leave out the facts of so-called spiritualism, as being still in dispute. Psychology, as a natural science, confines itself to the present life, in which every mind appears yoked to a body through which its manifestations appear. In the present world, then, minds precede, succeed, and coexist with each other in the common receptacle of time, and of their *collective* relations to the latter nothing more can be said. The life of the *individual* consciousness in time seems, however, to be an interrupted one, so that the question:

Are we ever wholly unconscious?

becomes one which must be discussed. Sleep, fainting, coma, epilepsy, and other 'unconscious' conditions are apt to break in upon and occupy large durations of what we nevertheless consider the mental history of a single man. And, the fact of interruption being admitted, is it not possible that it may exist where we do not suspect it, and even perhaps in an incessant and fine-grained form?

This might happen, and yet the subject himself never know it. We often take ether and have operations performed without a suspicion that our consciousness has suffered a breach. The two ends join each other smoothly over the gap; and only the sight of our wound assures us that we must have been living through a time which for our immediate consciousness was non-existent. Even in sleep this sometimes happens: We think we have had no nap, and it takes the clock to assure us that we are wrong.^[198] We thus may live through a real outward time, a time known by the psychologist who studies us, and yet not *feel* the time, or infer it from any inward sign. The question is, how often does this happen? Is consciousness really discontinuous, incessantly interrupted and recommencing (from the psychologist's point of view)? and does it only seem continuous to itself by an illusion analogous to that of the zoetrope? Or is it at most times as continuous outwardly as it inwardly seems?

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It must be confessed that we can give no rigorous answer to this question. Cartesians, who hold that the *essence* of the soul is to think, can of course solve it *a priori*, and explain the appearance of thoughtless intervals either by lapses in our ordinary memory, or by the sinking of consciousness to a minimal state, in which perhaps all that it feels is a bare existence which leaves no particulars behind to be recalled. If, however, one have no doctrine about the soul or its essence, one is free to take the appearances for what they seem to be, and to admit that the mind, as well as the body, may go to sleep.

Locke was the first prominent champion of this latter view, and the pages in which he attacks the Cartesian belief are as spirited as any in his Essay. "Every drowsy nod shakes their doctrine who teach that their soul is always thinking." He will not believe that men so easily forget. M. Jouffroy and Sir W. Hamilton, attacking the question in the same empirical way, are led to an opposite conclusion. Their reasons, briefly stated, are these:

In somnambulism, natural or induced, there is often a great display of intellectual activity, followed by complete oblivion of all that has passed.^[199]

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On being suddenly awakened from a sleep, however profound, we always catch ourselves in the middle of a dream. Common dreams are often remembered for a few minutes after waking, and then irretrievably lost.

Frequently, when awake and absent-minded, we are visited by thoughts and images which the next instant we cannot recall.

Our insensibility to habitual noises, etc., whilst awake, proves that we can neglect to attend to that which we nevertheless feel. Similarly in sleep, we grow inured, and sleep soundly in presence of sensations of sound, cold, contact, etc., which at first prevented our complete repose. We have learned to neglect them whilst asleep as we should whilst awake. The mere *sense-impressions* are the same when the sleep is deep as when it is light; the difference must lie in a *judgment* on the part of the apparently slumbering mind that they are not worth noticing.

This discrimination is equally shown by nurses of the sick and mothers of infants, who will sleep through much noise of an irrelevant sort, but waken at the slightest stirring of the patient or the babe. This last fact shows the *sense-organ* to be pervious for sounds.

Many people have a remarkable faculty of registering when asleep the flight of time. They will habitually wake up at the same minute day after day, or will wake punctually at an unusual hour determined upon overnight. How can this knowledge of the hour (more

accurate often than anything the waking consciousness shows) be possible without mental activity during the interval?

Such are what we may call the classical reasons for admitting that the mind is active even when the person afterwards ignores the fact.^[200] Of late years, or rather, one may say, of late months, they have been reinforced by a lot of curious observations made on hysterical and hypnotic subjects, which prove the existence of a highly developed consciousness in places where it has hitherto not been suspected at all. These observations throw such a novel light upon human nature that I must give them in some detail. That at least four different and in a certain sense rival observers should agree in the same conclusion justifies us in accepting the conclusion as true.

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'Unconsciousness' in Hysterics.

One of the most constant symptoms in persons suffering from hysteric disease in its extreme forms consists in alterations of the natural sensibility of various parts and organs of the body. Usually the alteration is in the direction of defect, or anæsthesia. One or both eyes are blind, or color-blind, or there is hemianopsia (blindness to one half the field of view), or the field is contracted. Hearing, taste, smell may similarly disappear, in part or in totality. Still more striking are the cutaneous anæsthesias. The old witch-finders looking for the 'devil's seals' learned well the existence of those insensible patches on the skin of their victims, to which the minute physical examinations of recent medicine have but recently attracted attention again. They may be scattered anywhere, but are very apt to affect one side of the body. Not infrequently they affect an entire lateral half, from head to foot; and the insensible skin of, say, the left side will then be found separated from the naturally sensitive skin of the right by a perfectly sharp line of demarcation down the middle of the front and back. Sometimes, most remarkable of all, the entire skin, hands, feet, face, everything, and the mucous membranes, muscles and joints so far as they can be explored, become *completely* insensible without the other vital functions becoming gravely disturbed.

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These hysterical anæsthesias can be made to disappear more or less completely by various odd processes. It has been recently found that magnets, plates of metal, or the electrodes of a battery, placed against the skin, have this peculiar power. And when one side is relieved in this way, the anæsthesia is often found to have transferred itself to the opposite side, which until then was well. Whether these strange effects of magnets and metals be due to their direct physiological action, or to a prior effect on the patient's mind ('expectant attention' or 'suggestion') is still a mooted question. A still better awakener of sensibility is the hypnotic trance, into which many of these patients can be very easily placed, and in which their lost sensibility not infrequently becomes entirely restored. Such returns of sensibility succeed the times of insensibility and alternate with them. But Messrs. Pierre Janet^[201] and A. Binet^[202] have shown that during the times of anæsthesia, and coexisting with it, *sensibility to the anæsthetic parts is also there, in the form of a secondary consciousness* entirely cut off from the primary or normal one, but susceptible of being *tapped* and made to testify to its existence in various odd ways.

Chief amongst these is what M. Janet calls 'the method of *distraction*.' These hysterics are apt to possess a very narrow field of attention, and to be unable to think of more than one thing at a time. When talking with any person they forget everything else. "When Lucie talked directly with any one," says M. Janet, "she ceased to be able to hear any other person. You may stand behind her, call her by name, shout abuse into her ears, without making her turn round; or place yourself before her, show her objects, touch her, etc., without attracting her notice. When finally she becomes aware of you, she thinks you have just come into the room again, and greets you accordingly. This singular forgetfulness makes her liable to tell all her secrets aloud, unrestrained by the presence of unsuitable auditors."

Now M. Janet found in several subjects like this that if he came up behind them whilst they were plunged in conversation with a third party, and addressed them in a whisper, telling them to raise their hand or perform other simple acts, they would obey the order given, although their *talking* intelligence was quite unconscious of receiving it. Leading them from one thing to another, he made them reply by signs to his whispered questions, and finally made them answer in writing, if a pencil were placed in their hand. The primary consciousness meanwhile went on with the conversation, entirely unaware of these performances on the hand's part. The consciousness which presided over these latter appeared in its turn to be quite as little disturbed by the upper consciousness's concerns. This *proof by 'automatic' writing*, of a secondary consciousness's existence, is the most cogent and striking one; but a crowd of other facts prove the same thing. If I run through them rapidly, the reader will probably be convinced.

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The apparently anæsthetic hand of these subjects, for one thing, *will often adapt itself discriminatingly* to whatever object may be put into it. With a pencil it will make writing movements; into a pair of scissors it will put its fingers and will open and shut them, etc., etc. The primary consciousness, so to call it, is meanwhile unable to say whether or no *anything* is in the hand, if the latter be hidden from sight. "I put a pair of eyeglasses into Léonie's anæsthetic hand, this hand opens it and raises it towards the nose, but half way thither it enters the field of vision of Léonie, who sees it and stops stupefied: 'Why,' says she, 'I have an eye-glass in my left hand!'" M. Binet found a very curious sort of connection between the apparently anæsthetic skin and the mind in some Salpêtrière-subjects. Things placed in the hand were not felt, but *thought* of (apparently in visual terms) and in no wise referred by the subject to their starting point in the hand's sensation. A key, a knife, placed in the hand occasioned *ideas* of a key or a knife, but the hand felt nothing. Similarly the subject *thought* of the number 3, 6, etc., if the hand or finger was bent three or six times by the operator, or if he stroked it three, six, etc., times.

In certain individuals there was found a still odder phenomenon, which reminds one of that curious idiosyncrasy of 'colored hearing' of which a few cases have been lately described with great care by foreign writers. These individuals, namely, *saw* the impression received by the hand, but could not feel it; and the thing seen appeared by no means associated with the hand, but more like an independent vision, which usually interested and surprised the patient. Her hand being hidden by a screen, she was ordered to look at another screen and to tell of any visual image which might project itself thereon. Numbers would then come, corresponding to the number of times the insensible member was raised, touched, etc. Colored lines and figures would come, corresponding to similar ones traced on the palm; the hand itself or its fingers would come when manipulated and finally objects placed in it would come; but on the hand itself nothing would ever be felt. Of course simulation would not be hard here; but M. Binet disbelieves this (usually very shallow) explanation to be a probable one in cases in question.^[203]

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The usual way in which doctors measure the delicacy of our touch is by the compass-points. Two points are normally felt as one whenever they are too close together for discrimination; but what is 'too close' on one part of the skin may seem very far apart on another. In the middle of the back or on the thigh, less than 3 inches may be too close; on the finger-tip a tenth of an inch is far enough apart. Now, as tested in this way, with the appeal made to the primary consciousness, which talks through the mouth and seems to hold the field alone, a certain person's skin may be entirely anæsthetic and not feel the compass-points at all; and yet this same skin will prove to have a perfectly normal sensibility if the appeal be made to that other secondary or sub-consciousness, which expresses itself automatically by writing or by movements of the hand. M. Binet, M. Pierre Janet, and M. Jules Janet have all found this. The subject, whenever touched, would signify 'one point' or 'two points,' as accurately as if she were a normal person. She would signify it only by these movements; and of the movements themselves her primary self would be as unconscious as of the facts they

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signified, for what the submerged consciousness makes the hand do automatically is unknown to the consciousness which uses the mouth.

Messrs. Bernheim and Pitres have also proved, by observations too complicated to be given in this spot, that the hysterical blindness is no real blindness at all. The eye of a hysteric which is totally blind when the other or seeing eye is shut, will do its share of vision perfectly well when *both* eyes are open together. But even where both eyes are semi-blind from hysterical disease, the method of automatic writing proves that their perceptions exist, only cut off from communication with the upper consciousness. M. Binet has found the hand of his patients unconsciously writing down words which their eyes were vainly endeavoring to 'see,' i.e., to bring to the upper consciousness. Their submerged consciousness was of course seeing them, or the hand could not have written as it did. Colors are similarly perceived by the sub-conscious self, which the hysterically color-blind eyes cannot bring to the normal consciousness. Pricks, burns, and pinches on the anæsthetic skin, all unnoticed by the upper self, are recollected to have been suffered, and complained of, as soon as the under self gets a chance to express itself by the passage of the subject into hypnotic trance.

It must be admitted, therefore, that *in certain persons*, at least, *the total possible consciousness may be split into parts which coexist but mutually ignore each other*, and share the objects of knowledge between them. More remarkable still, they are *complementary*. Give an object to one of the consciousnesses, and by that fact you remove it from the other or others. Barring a certain common fund of information, like the command of language, etc., what the upper self knows the under self is ignorant of, and *vice versa*. M. Janet has proved this beautifully in his subject Lucie. The following experiment will serve as the type of the rest: In her trance he covered her lap with cards, each bearing a number. He then told her that on waking she should *not see* any card whose number was a multiple of three. This is the ordinary so-called 'post-hypnotic suggestion,' now well known, and for which Lucie was a well-adapted subject. Accordingly, when she was awakened and asked about the papers on her lap, she counted and said she saw those only whose number was not a multiple of 3. To the 12, 18, 9, etc., she was blind. But the *hand*, when the sub-conscious self was interrogated by the usual method of engrossing the upper self in another conversation, wrote that the only cards in Lucie's lap were those numbered 12, 18, 9, etc., and on being asked to pick up all the cards which were there, picked up these and let the others lie. Similarly when the sight of certain things was suggested to the sub-conscious Lucie, the normal Lucie suddenly became partially or totally blind. "What is the matter? I can't see!" the normal personage suddenly cried out in the midst of her conversation, when M. Janet whispered to the secondary personage to make use of her eyes. The anæsthesias, paralyses, contractions and other irregularities from which hysterics suffer seem then to be due to the fact that their secondary personage has enriched itself by robbing the primary one of a function which the latter ought to have retained. The curative indication is evident: get at the secondary personage, by hypnotization or in whatever other way, and make her *give up* the eye, the skin, the arm, or whatever the affected part may be. The normal self thereupon regains possession, sees, feels, or is able to move again. In this way M. Jules Janet easily cured the well-known subject of the Salpêtrière, Wit...., of all sorts of afflictions which, until he discovered the secret of her deeper trance, it had been difficult to subdue. "Cessez cette mauvaise plaisanterie," he said to the secondary self—and the latter obeyed. The way in which the various personages share the stock of possible sensations between them seems to be amusingly illustrated in this young woman. When awake, her skin is insensible everywhere except on a zone about the arm where she habitually wears a gold bracelet. This zone has feeling; but in the deepest trance, when all the rest of her body feels, this particular zone becomes absolutely anæsthetic.

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Sometimes the mutual ignorance of the selves leads to incidents which are strange enough. The acts and movements performed by the sub-conscious self are withdrawn from the conscious one, and the subject will do all sorts of incongruous things of which he remains

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quite unaware. "I order Lucie [by the method of *distraction*] to make a *pied de nez*, and her hands go forthwith to the end of her nose. Asked what she is doing, she replies that she is doing nothing, and continues for a long time talking, with no apparent suspicion that her fingers are moving in front of her nose. I make her walk about the room; she continues to speak and believes herself sitting down."

M. Janet observed similar acts in a man in alcoholic delirium. Whilst the doctor was questioning him, M. J. made him by whispered suggestion walk, sit, kneel, and even lie down on his face on the floor, he all the while believing himself to be standing beside his bed. Such *bizarceries* sound incredible, until one has seen their like. Long ago, without understanding it, I myself saw a small example of the way in which a person's knowledge may be shared by the two selves. A young woman who had been writing automatically was sitting with a pencil in her hand, trying to recall at my request the name of a gentleman whom she had once seen. She could only recollect the first syllable. Her hand meanwhile, without her knowledge, wrote down the last two syllables. In a perfectly healthy young man who can write with the planchette, I lately found the hand to be entirely anæsthetic during the writing act; I could prick it severely without the Subject knowing the fact. The *writing on the planchette*, however, accused me in strong terms of hurting the hand. Pricks on the *other* (non-writing) hand, meanwhile, which awakened strong protest from the young man's vocal organs, were denied to exist by the self which made the planchette go.^[204]

We get exactly similar results in the so-called post-hypnotic suggestion. It is a familiar fact that certain subjects, when told during a trance to perform an act or to experience an hallucination after waking, will when the time comes, obey the command. How is the command registered? How is its performance so accurately timed? These problems were long a mystery, for the primary personality remembers nothing of the trance or the suggestion, and will often trump up an improvised pretext for yielding to the unaccountable impulse which possesses the man so suddenly and which he cannot resist. Edmund Gurney was the first to discover, by means of automatic writing, that the secondary self is awake, keeping its attention constantly fixed on the command and watching for the signal of its execution. Certain trance-subjects who were also automatic writers, when roused from trance and put to the planchette,—not knowing then what they wrote, and having their upper attention fully engrossed by reading aloud, talking, or solving problems in mental arithmetic,—would inscribe the orders which they had received, together with notes relative to the time elapsed and the time yet to run before the execution.^[205] It is therefore to no 'automatism' in the mechanical sense that such acts are due: a self presides over them, a split-off, limited and buried, but yet a fully conscious, self. More than this, the buried self often comes to the surface and drives out the other self whilst the acts are performing. In other words, the subject lapses into trance again when the moment arrives for execution, and has no subsequent recollection of the act which he has done. Gurney and Beaunis established this fact, which has since been verified on a large scale; and Gurney also showed that the patient became *suggestible* again during the brief time of the performance. M. Janet's observations, in their turn, well illustrate the phenomenon.

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"I tell Lucie to keep her arms raised after she shall have awakened. Hardly is she in the normal state, when up go her arms above her head, but she pays no attention to them. She goes, comes, converses, holding her arms high in the air. If asked what her arms are doing, she is surprised at such a question, and says very sincerely: 'My hands are doing nothing; they are just like yours.'... I command her to weep, and when awake she really sobs, but continues in the midst of her tears to talk of very gay matters. The sobbing over, there remained no trace of this grief, which seemed to have been quite sub-conscious."

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The primary self often has to invent an hallucination by which to mask and hide from its own view the deeds which the other self is enacting. Léonie 3^[206] writes real letters whilst

Léonie 1 believes that she is knitting; or Lucie 2 really comes to the doctor's office, whilst Lucie 1 believes herself to be at home. This is a sort of delirium. The alphabet, or the series of numbers, when handed over to the attention of the secondary personage may for the time be lost to the normal self. Whilst the hand writes the alphabet, obediently to command, the 'subject,' to her great stupefaction, finds herself unable to recall it, etc. Few things are more curious than these relations of mutual exclusion, of which all gradations exist between the several partial consciousnesses.

How far this splitting up of the mind into separate consciousnesses may exist in each one of us is a problem. M. Janet holds that it is only possible where there is abnormal weakness, and consequently a defect of unifying or co-ordinating power. An hysterical woman abandons part of her consciousness because she is too weak nervously to hold it together. The abandoned part meanwhile may solidify into a secondary or sub-conscious self. In a perfectly sound subject, on the other hand, what is dropped out of mind at one moment keeps coming back at the next. The whole fund of experiences and knowledges remains integrated, and no split-off portions of it can get organized stably enough to form subordinate selves. The stability, monotony, and stupidity of these latter is often very striking. The post-hypnotic sub-consciousness seems to think of nothing but the order which it last received; the cataleptic sub-consciousness, of nothing but the last position imprinted on the limb. M. Janet could cause definitely circumscribed reddening and tumefaction of the skin on two of his subjects, by suggesting to them in hypnotism the hallucination of a mustard-poultice of any special shape. "J'ai tout le temps pensé à votre sinapisme," says the subject, when put back into trance after the suggestion has taken effect. A man N., whom M. Janet operated on at long intervals, was betweenwhiles tampered with by another operator, and when put to sleep again by M. Janet, said he was 'too far away to receive orders, being in Algiers.' The other operator, having suggested that hallucination, had forgotten to remove it before waking the subject from his trance, and the poor passive trance-personality had stuck for weeks in the stagnant dream. Léonie's sub-conscious performances having been illustrated to a caller, by a '*pied de nez*' executed with her left hand in the course of conversation, when, a year later, she meets him again, up goes the same hand to her nose again, without Léonie's normal self suspecting the fact.

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All these facts, taken together, form unquestionably the beginning of an inquiry which is destined to throw a new light into the very abysses of our nature. It is for that reason that I have cited them at such length in this early chapter of the book. They prove one thing conclusively, namely, that *we must never take a person's testimony, however sincere, that he has felt nothing, as proof positive that no feeling has been there.* It may have been there as part of the consciousness of a 'secondary personage,' of whose experiences the primary one whom we are consulting can naturally give no account. In hypnotic subjects (as we shall see in a later chapter) just as it is the easiest thing in the world to paralyze a movement or member by simple suggestion, so it is easy to produce what is called a systematized anæsthesia by word of command. A systematized anæsthesia means an insensibility, not to any one element of things, but to some one concrete thing or class of things. The subject is made blind or deaf to a certain person in the room and to no one else, and thereupon denies that that person is present, or has spoken, etc. M. P. Janet's Lucie, blind to some of the numbered cards in her lap ([p. 207](#) above), is a case in point. Now when the object is simple, like a red wafer or a black cross, the subject, although he denies that he sees it when he looks straight at it, nevertheless gets a 'negative after-image' of it when he looks away again, showing that the *optical impression* of it has been received. Moreover reflection shows that

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such a subject must *distinguish the object from others like it in order to be blind to it*. Make him blind to one person in the room, set all the persons in a row, and tell him to count them. He will count all but that one. But how can he tell *which* one not to count without recognizing who he is? In like manner, make a stroke on paper or blackboard, and tell him it is not there, and he will see nothing but the clean paper or board. Next (he not looking) surround the original stroke with other strokes exactly like it, and ask him what he sees. He will point out one by one all the new strokes, and omit the original one every time, no matter how numerous the new strokes may be, or in what order they are arranged. Similarly, if the original single stroke to which he is blind be *doubled* by a prism of some sixteen degrees placed before one of his eyes (both being kept open), he will say that he now sees *one* stroke, and point in the direction in which the image seen through the prism lies, ignoring still the original stroke.

Obviously, then, he is not blind to the *kind* of stroke in the least. He is blind only to one individual stroke of that kind in a particular position on the board or paper—that is to a particular complex object; and, paradoxical as it may seem to say so, he must distinguish it with great accuracy from others like it, in order to remain blind to it when the others are brought near. He discriminates it, as a preliminary to not seeing it at all.

Again, when by a prism before one eye a previously invisible line has been made visible to that eye, and the other eye is thereupon closed or screened, *its* closure makes no difference; the line still remains visible. But if then the prism be removed, the line will disappear even to the eye which a moment ago saw it, and both eyes will revert to their original blind state.

We have, then, to deal in these cases neither with a blindness of the eye itself, nor with a mere failure to notice, but with something much more complex; namely, an active counting out and positive exclusion of certain objects. It is as when one 'cuts' an acquaintance, 'ignores' a claim, or 'refuses to be influenced' by a consideration. But the perceptive activity which works to this result is disconnected from the consciousness which is personal, so to speak, to the subject, and makes of the object concerning which the suggestion is made, its own private possession and prey.^[207]

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The mother who is asleep to every sound but the stirrings of her babe, evidently has the babe-portion of her auditory sensibility systematically awake. Relatively to that, the rest of her mind is in a state of systematized anæsthesia. That department, split off and disconnected from the sleeping part, can none the less wake the latter up in case of need. So that on the whole the quarrel between Descartes and Locke as to whether the mind ever sleeps is less near to solution than ever. On *a priori* speculative grounds Locke's view that thought and feeling may at times wholly disappear seems the more plausible. As glands cease to secrete and muscles to contract, so the brain should sometimes cease to carry currents, and with this minimum of its activity might well coexist a minimum of consciousness. On the other hand, we see how deceptive are appearances, and are forced to admit that a part of consciousness may sever its connections with other parts and yet continue to be. On the whole it is best to abstain from a conclusion. The science of the near future will doubtless answer this question more wisely than we can now.

Let us turn now to consider the

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RELATIONS OF CONSCIOUSNESS TO SPACE.

This is the problem known in the history of philosophy as the *question of the seat of the soul*. It has given rise to much literature, but we must ourselves treat it very briefly. Everything depends on what we conceive the soul to be, an extended or an inextended entity. If the former, it may occupy a seat. If the latter, it may not; though it has been thought that even then it might still have a *position*. Much hair-splitting has arisen about the possibility of an inextended thing nevertheless being *present* throughout a certain amount of

extension. We must distinguish the kinds of presence. In some manner our consciousness is 'present' to everything with which it is in relation. I am *cognitively* present to Orion whenever I perceive that constellation, but I am not *dynamically* present there, I work no effects. To my brain, however, I am dynamically present, inasmuch as my thoughts and feelings seem to react upon the processes thereof. If, then, by the seat of the mind is meant nothing more than the locality with which it stands in immediate dynamic relations, we are certain to be right in saying that its seat is somewhere in the cortex of the brain. Descartes, as is well known, thought that the inextended soul was immediately present to the pineal gland. Others, as Lotze in his earlier days, and W. Volkmann, think its position must be at some point of the structureless matrix of the anatomical brain-elements, at which point they suppose that all nerve-currents may cross and combine. The scholastic doctrine is that the soul is totally present, both in the whole and in each and every part of the body. This mode of presence is said to be due to the soul's inextended nature and to its simplicity. Two extended entities could only correspond in space with one another, part to part,—but not so does the soul, which has no parts, correspond with the body. Sir Wm. Hamilton and Professor Bowen defend something like this view. I. H. Fichte, Ulrici, and, among American philosophers, Mr. J. E. Walter,^[208] maintain the soul to be a space-filling principle. Fichte calls it the inner body, Ulrici likens it to a fluid of non-molecular composition. These theories remind us of the 'theosophic' doctrines of the present day, and carry us back to times when the soul as vehicle of consciousness was not discriminated, as it now is, from the vital principle presiding over the formation of the body. Plato gave head, breast, and abdomen to the immortal reason, the courage, and the appetites, as their seats respectively. Aristotle argues that the heart is the sole seat. Elsewhere we find the blood, the brain, the lungs, the liver the kidneys even, in turn assigned as seat of the whole or part of the soul.^[209]

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The truth is that if the thinking principle is extended we neither know its form nor its seat; whilst if unextended, it is absurd to speak of its having any space-relations at all. Space-relations we shall see hereafter to be *sensible* things. The only objects that can have mutual relations of position are objects that are perceived coexisting in the same felt space. A thing not perceived at all, such as the inextended soul must be, cannot coexist with any perceived objects in this way. No lines can be felt stretching from it to the other objects. It can form no terminus to any space-interval. It can therefore in no intelligible sense enjoy position. Its relations cannot be spatial, but must be exclusively cognitive or dynamic, as we have seen. So far as they are dynamic, to talk of the soul being 'present' is only a figure of speech. Hamilton's doctrine that the soul is present to the whole body is at any rate false: for cognitively its presence extends far beyond the body, and dynamically it does not extend beyond the brain.^[210]

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THE RELATIONS OF MINDS TO OTHER OBJECTS

are either relations to *other minds*, or to *material things*. The material things are either the mind's *own brain*, on the one hand, or *anything else*, on the other. The relations of a mind to its own brain are of a unique and utterly mysterious sort; we discussed them in the last two chapters, and can add nothing to that account.

The mind's relations to other objects than the brain are *cognitive and emotional* relations exclusively, so far as we know. It *knows* them, and it inwardly *welcomes or rejects* them, but it has no other dealings with them. When it seems to *act* upon them, it only does so through the intermediary of its own body, so that not it but the body is what acts on them, and the brain must first act upon the body. The same is true when other things seem to act on it—they only act on the body, and through that on its brain.^[211] All that it *can do directly* is to know other things, misknow or ignore them, and to find that they interest it, in this fashion or in that.

Now the *relation of knowing* is the most mysterious thing in the world. If we ask how one thing *can* know another we are led into the heart of *Erkenntnisstheorie* and metaphysics. The psychologist, for his part, does not consider the matter so curiously as this. Finding a world before him which he cannot but believe that *he* knows, and setting himself to study his own past thoughts, or someone else's thoughts, of what he believes to be that same world; he cannot but conclude that those other thoughts know it after their fashion even as he knows it after his. Knowledge becomes for him an ultimate relation that must be admitted, whether it be explained or not, just like difference or resemblance, which no one seeks to explain.

Were our topic Absolute Mind instead of being the concrete minds of individuals dwelling in the natural world, we could not tell whether that Mind had the function of knowing or not, as knowing is commonly understood. We might learn the complexion of its thoughts; but, as we should have no realities outside of it to compare them with,—for if we had, the Mind would not be Absolute,—we could not criticise them, and find them either right or wrong; and we should have to call them simply the thoughts, and not the *knowledge*, of the Absolute Mind. Finite minds, however, can be judged in a different way, because the psychologist himself can go bail for the independent reality of the objects of which they think. He knows these to exist outside as well as inside the minds in question; he thus knows whether the minds think and *know*, or only think; and though his knowledge is of course that of a fallible mortal, there is nothing in the conditions that should make it more likely to be wrong in this case than in any other.

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Now by what tests does the psychologist decide whether the state of mind he is studying is a bit of knowledge, or only a subjective fact not referring to anything outside itself?

He uses the tests we all practically use. If the state of mind *resembles* his own idea of a certain reality; or if without resembling his idea of it, it seems to imply that reality and refer to it by operating upon it through the bodily organs; or even if it resembles and operates on some other reality that implies, and leads up to, and terminates in, the first one,—in either or all of these cases the psychologist admits that the state of mind takes cognizance, directly or remotely, distinctly or vaguely, truly or falsely, of the reality's nature and position in the world. If, on the other hand, the mental state under examination neither resembles nor operates on any of the realities known to the psychologist, he calls it a subjective state pure and simple, possessed of no cognitive worth. If, again, it resemble a reality or a set of realities as he knows them, but altogether fail to operate on them or modify their course by producing bodily motions which the psychologist sees, then the psychologist, like all of us, may be in doubt. Let the mental state, for example, occur during the sleep of its subject. Let the latter dream of the death of a certain man, and let the man simultaneously die. Is the dream a mere coincidence, or a veritable cognition of the death? Such puzzling cases are what the Societies for 'Psychical Research' are collecting and trying to interpret in the most reasonable way.

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If the dream were the only one of the kind the subject ever had in his life, if the context of the death in the dream differed in many particulars from the real death's context, and if the dream led to no action about the death, unquestionably we should all call it a strange coincidence, and naught besides. But if the death in the dream had a long context, agreeing point for point with every feature that attended the real death; if the subject were constantly having such dreams, all equally perfect, and if on awaking he had a habit of acting immediately as if they were true and so getting 'the start' of his more tardily informed neighbors,—we should probably all have to admit that he had some mysterious kind of clairvoyant power, that his dreams in an inscrutable way knew just those realities which they figured, and that the word 'coincidence' failed to touch the root of the matter. And whatever doubts any one preserved would completely vanish if it should appear that from the midst of his dream he had the power of *interfering* with the course of the reality, and making the events in it turn this way or that, according as he dreamed they should. Then at least it

would be certain that he and the psychologist were dealing with the *same*. It is by such tests as these that we are convinced that the waking minds of our fellows and our own minds know the same external world.

The psychologist's attitude towards cognition will be so important in the sequel that we must not leave it until it is made perfectly clear. *It is a thoroughgoing dualism*. It supposes two elements, mind knowing and thing known, and treats them as irreducible. Neither gets out of itself or into the other, neither in any way *is* the other, neither *makes* the other. They just stand face to face in a common world, and one simply knows, or is known unto, its counterpart. This singular relation is not to be expressed in any lower terms, or translated into any more intelligible name. Some sort of *signal* must be given by the thing to the mind's brain, or the knowing will not occur—we find as a matter of fact that the mere *existence* of a thing outside the brain is not a sufficient cause for our knowing it: it must strike the brain in some way, as well as be there, to be known. But the brain being struck, the knowledge is constituted by a new construction that occurs altogether *in* the mind. The thing remains the same whether known or not.^[212] And when once there, the knowledge may remain there, whatever becomes of the thing.

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By the ancients, and by unreflecting people perhaps to-day, knowledge is explained as the *passage* of something from without into the mind—the latter, so far, at least, as its sensible affections go, being passive and receptive. But even in mere sense-impression the duplication of the object by an inner construction must take place. Consider, with Professor Bowne, what happens when two people converse together and know each other's mind.

"No thoughts leave the mind of one and cross into the mind of the other. When we speak of an exchange of thought, even the crudest mind knows that this is a mere figure of speech.... To perceive another's thought, we must construct his thought within ourselves;... this thought is our own and is strictly original with us. At the same time we owe it to the other; and if it had not originated with him, it would probably not have originated with us. But what has the other done?... This: by an entirely mysterious world-order, the speaker is enabled to produce a series of signs which are totally unlike [the] thought, but which, by virtue of the same mysterious order, act as a series of incitements upon the hearer, so that he constructs within himself the corresponding mental state. The act of the speaker consists in availing himself of the proper incitements. The act of the hearer is immediately only the reaction of the soul against the incitement.... All communion between finite minds is of this sort.... Probably no reflecting person would deny this conclusion, but when we say that what is thus true of perception of another's thought is equally true of the perception of the outer world in general, many minds will be disposed to question, and not a few will deny it outright. Yet there is no alternative but to affirm that to perceive the universe we must construct it in thought, and that our knowledge of the universe is but the unfolding of the mind's inner nature.... By describing the mind as a waxen tablet, and things as impressing themselves upon it, we seem to get great insight until we think to ask where this extended tablet is, and how things stamp themselves on it, and how the perceptive act would be explained even if they did.... The immediate antecedents of sensation and perception are a series of nervous changes in the brain. Whatever we know of the outer world is revealed only in and through these nervous changes. But these are totally unlike the objects assumed to exist as their causes. If we might conceive the mind as in the light, and in direct contact with its objects, the imagination at least would be comforted; but when we conceive the mind as coming in contact with the outer

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world only in the dark chamber of the skull, and then not in contact with the objects perceived, but only with a series of nerve-changes of which, moreover, it knows nothing, it is plain that the object is a long way off. All talk of pictures, impressions, etc., ceases because of the lack of all the conditions to give such figures any meaning. It is not even clear that we shall ever find our way out of the darkness into the world of light and reality again. We begin with complete trust in physics and the senses, and are forthwith led away from the object into a nervous labyrinth, where the object is entirely displaced by a set of nervous changes which are totally unlike anything but themselves. Finally, we land in the dark chamber of the skull. The object has gone completely, and knowledge has not yet appeared. Nervous signs are the raw material of all knowledge of the outer world according to the most decided realism. But in order to pass beyond these signs into a knowledge of the outer world, we must posit an interpreter who shall read back these signs into their objective meaning. But that interpreter, again, must implicitly contain the meaning of the universe within itself; and these signs are really but excitations which cause the soul to unfold what is within itself. Inasmuch as by common consent the soul communicates with the outer world only through these signs, and never comes nearer to the object than such signs can bring it, it follows that the principles of interpretation must be in the mind itself, and that the resulting construction is primarily only an expression of the mind's own nature. All reaction is of this sort; it expresses the nature of the reacting agent, and knowledge comes under the same head, this fact makes it necessary for us either to admit a pre-established harmony between the laws and nature of thought and the laws and nature of things, or else to allow that the objects of perception, the universe as it appears, are purely phenomenal, being but the way in which the mind reacts against the ground of its sensations."^[213]

The dualism of Object and Subject and their pre-established harmony are what the psychologist as such must assume, whatever ulterior monistic philosophy he may, as an individual who has the right also to be a metaphysician, have in reserve. I hope that this general point is now made clear, so that we may leave it, and descend to some distinctions of detail.

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There are two kinds of knowledge broadly and practically distinguishable: we may call them respectively knowledge of acquaintance and knowledge-about. Most languages express the distinction; thus, γνῶναι, εἰδέναι; noscere, scire; kennen, wissen; connaître, savoir.^[214] I am acquainted with many people and things, which I know very little about, except their presence in the places where I have met them. I know the color blue when I see it, and the flavor of a pear when I taste it; I know an inch when I move my finger through it; a second of time, when I feel it pass; an effort of attention when I make it; a difference between two things when I notice it; but about the inner nature of these facts or what makes them what they are, I can say nothing at all. I cannot impart acquaintance with them to any one who has not already made it himself. I cannot describe them, make a blind man guess what blue is like, define to a child a syllogism, or tell a philosopher in just what respect distance is just what it is, and differs from other forms of relation. At most, I can say to my friends, Go to certain places and act in certain ways, and these objects will probably come. All the elementary natures of the world, its highest genera, the simple qualities of matter and mind, together with the kinds of relation that subsist between them, must either not be known at all, or known in this dumb way of acquaintance without knowledge-about. In minds able to speak at all there is, it is true, some knowledge about everything. Things can at least be

classed, and the times of their appearance told. But in general, the less we analyze a thing, and the fewer of its relations we perceive, the less we know about it and the more our familiarity with it is of the acquaintance-type. The two kinds of knowledge are, therefore, as the human mind practically exerts them, relative terms. That is, the same thought of a thing may be called knowledge-about it in comparison with a simpler thought, or acquaintance with it in comparison with a thought of it that is more articulate and explicit still.

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The grammatical sentence expresses this. Its 'subject' stands for an object of acquaintance which, by the addition of the predicate, is to get something known about it. We may already know a good deal, when we hear the subject named—its name may have rich connotations. But, know we much or little then, we know more still when the sentence is done. We can relapse at will into a mere condition of acquaintance with an object by scattering our attention and staring at it in a vacuous trance-like way. We can ascend to knowledge *about* it by rallying our wits and proceeding to notice and analyze and think. What we are only acquainted with is only *present* to our minds; we *have* it, or the idea of it. But when we know about it, we do more than merely have it; we seem, as we think over its relations, to subject it to a sort of *treatment* and to *operate* upon it with our thought. The words *feeling* and *thought* give voice to the antithesis. Through feelings we become acquainted with things, but only by our thoughts do we know about them. Feelings are the germ and starting point of cognition, thoughts the developed tree. The minimum of grammatical subject, of objective presence, of reality known about, the mere beginning of knowledge, must be named by the word that says the least. Such a word is the interjection, as *lo! there! ecco! voilà!* or the article or demonstrative pronoun introducing the sentence, as *the, it, that*. In [Chapter XII](#) we shall see a little deeper into what this distinction, between the mere mental having or feeling of an object and the thinking of it, portends.

The mental states usually distinguished as feelings are the *emotions*, and the *sensations* we get from skin, muscle, viscus, eye, ear, nose, and palate. The 'thoughts,' as recognized in popular parlance, are the *conceptions* and *judgments*. When we treat of these mental states in particular we shall have to say a word about the cognitive function and value of each. It may perhaps be well to notice now that our senses only give us acquaintance with facts of body, and that of the mental states of other persons we only have conceptual knowledge. Of our own past states of mind we take cognizance in a peculiar way. They are 'objects of memory,' and appear to us endowed with a sort of warmth and intimacy that makes the perception of them seem more like a process of sensation than like a thought.

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- [198] Messrs. Payton Spence (Journal of Spec. Phil., x, 338, xiv, 286) and M. M. Garver (Amer. Jour. of Science, 3d series, xx, 189) argue, the one from speculative, the other from experimental grounds, that, the physical condition of consciousness being neural vibration, the consciousness must itself be incessantly interrupted by unconsciousness—about fifty times a second, according to Garver.
- [199] That the appearance of mental activity here is real can be proved by suggesting to the 'hypnotized' somnambulist that he shall remember when he awakes. He will then often do so.
- [200] For more details, cf. Malebranche, Rech. de la Verité, bk. iii, chap. i; J. Locke, Essay conc. H. U., book iii, ch. i; C. Wolf, Psychol. rationalis, § 59; Sir W. Hamilton, Lectures on Metaph., lecture xvii; J. Bascom, Science of Mind, § 12; Th. Jouffroy, Mélanges Philos., 'du Sommeil'; H. Holland, Chapters on Mental Physiol., p. 80; B. Brodie, Psychol. Researches, p. 147; E. M. Chesley, Journ. of Spec. Phil., vol. xi, p. 72; Th. Ribot, Maladies de la Personnalité, pp. 8-10; H. Lotze, Metaphysics, § 533.
- [201] L'Automatisme Psychologique, Paris, 1889, *passim*.

- [202] See his articles in the Chicago Open Court, for July, August and November, 1889. Also in the Revue Philosophique for 1889 and '90.
- [203] This whole phenomenon shows how an idea which remains itself below the threshold of a certain conscious self may occasion associative effects therein. The skin-sensations unfelt by the patient's primary consciousness awaken nevertheless their usual visual associates therein.
- [204] See Proceedings of American Soc. for Psych. Research, vol. i, p. 548.
- [205] Proceedings of the (London) Soc. for Psych. Research, May, 1887, p. 268 ff.
- [206] M. Janet designates by numbers the different personalities which the subject may display.
- [207] How to conceive of this state of mind is not easy. It would be much simpler to understand the process, if adding new strokes made the first one visible. There would then be two different objects apperceived as totals,—paper with one stroke, paper with many strokes; and, blind to the former, he would see all that was in the latter, because he would have apperceived it as a different total in the first instance.
- A process of this sort occurs sometimes (not always) when the new strokes, instead of being mere repetitions of the original one, are lines which combine with it into a total object, say a human face. The subject of the trance then may regain his sight of the line to which he had previously been blind, by seeing it as part of the face.
- [208] Perception of Space and Matter, 1879, part ii, chap. 3.
- [209] For a very good condensed history of the various opinions, see W. Volkman von Volkmar, Lehrbuch d. Psychologie, § 16, Anm. Complete references to Sir W. Hamilton are given in J. E. Walter, Perception of Space and Matter, pp. 65-6.
- [210] Most contemporary writers ignore the question of the soul's seat. Lotze is the only one who seems to have been much concerned about it, and his views have varied. Cf. Medicinische Psychol., § 10. Microcosmus, bk. iii, ch. 2. Metaphysic, bk. iii, ch. 5. Outlines of Psychol., part ii, ch. 3. See also G. T. Fechner, Psychophysik, chap. xxxvii.
- [211] I purposely ignore 'clairvoyance' and action upon distant things by 'mediums,' as not yet matters of common consent.
- [212] I disregard *consequences* which may later come to the thing from the fact that it is known. The knowing *per se* in no wise affects the thing.
- [213] B. P. Bowne: Metaphysics, pp. 407-10. Cf. also Lotze: Logik, §§ 308, 326-7.
- [214] Cf. John Grote: Exploratio Philosophica, p. 60; H. Helmholtz, Popular Scientific Lectures, London, p. 308-9.

CHAPTER IX.^[215]

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THE STREAM OF THOUGHT.

We now begin our study of the mind from within. Most books start with sensations, as the simplest mental facts, and proceed synthetically, constructing each higher stage from those below it. But this is abandoning the empirical method of investigation. No one ever had a simple sensation by itself. Consciousness, from our natal day, is of a teeming multiplicity of objects and relations, and what we call simple sensations are results of discriminative attention, pushed often to a very high degree. It is astonishing what havoc is wrought in

psychology by admitting at the outset apparently innocent suppositions, that nevertheless contain a flaw. The bad consequences develop themselves later on, and are irremediable, being woven through the whole texture of the work. The notion that sensations, being the simplest things, are the first things to take up in psychology is one of these suppositions. The only thing which psychology has a right to postulate at the outset is the fact of thinking itself, and that must first be taken up and analyzed. If sensations then prove to be amongst the elements of the thinking, we shall be no worse off as respects them than if we had taken them for granted at the start.

The first fact for us, then, as psychologists, is that thinking of some sort goes on. I use the word thinking, in accordance with what was said on [p. 186](#), for every form of consciousness indiscriminately. If we could say in English 'it thinks,' as we say 'it rains' or 'it blows,' we should be stating the fact most simply and with the minimum of assumption. As we cannot, we must simply say that *thought goes on*.

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FIVE CHARACTERS IN THOUGHT.

How does it go on? We notice immediately five important characters in the process, of which it shall be the duty of the present chapter to treat in a general way:

- 1) Every thought tends to be part of a personal consciousness.
- 2) Within each personal consciousness thought is always changing.
- 3) Within each personal consciousness thought is sensibly continuous.
- 4) It always appears to deal with objects independent of itself.
- 5) It is interested in some parts of these objects to the exclusion of others, and welcomes or rejects—*chooses* from among them, in a word—all the while.

In considering these five points successively, we shall have to plunge *in medias res* as regards our vocabulary, and use psychological terms which can only be adequately defined in later chapters of the book. But every one knows what the terms mean in a rough way; and it is only in a rough way that we are now to take them. This chapter is like a painter's first charcoal sketch upon his canvas, in which no niceties appear.

1) *Thought tends to Personal Form.*

When I say *every thought is part of a personal consciousness*, 'personal consciousness' is one of the terms in question. Its meaning we know so long as no one asks us to define it, but to give an accurate account of it is the most difficult of philosophic tasks. This task we must confront in the next chapter; here a preliminary word will suffice.

In this room—this lecture-room, say—there are a multitude of thoughts, yours and mine, some of which cohere mutually, and some not. They are as little each-for-itself and reciprocally independent as they are all-belonging-together. They are neither: no one of them is separate, but each belongs with certain others and with none beside. My thought belongs with my other thoughts, and your thought with your other thoughts. Whether anywhere in the room there be a mere thought, which is nobody's thought, we have no means of ascertaining, for we have no experience of its like. The only states of consciousness that we naturally deal with are found in personal consciousnesses, minds, selves, concrete particular I's and you's.

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Each of these minds keeps its own thoughts to itself. There is no giving or bartering between them. No thought even comes into direct *sight* of a thought in another personal consciousness than its own. Absolute insulation, irreducible pluralism, is the law. It seems as if the elementary psychic fact were not *thought* or *this thought* or *that thought*, but my

thought, every thought being *owned*. Neither contemporaneity, nor proximity in space, nor similarity of quality and content are able to fuse thoughts together which are sundered by this barrier of belonging to different personal minds. The breaches between such thoughts are the most absolute breaches in nature. Everyone will recognize this to be true, so long as the existence of *something* corresponding to the term 'personal mind' is all that is insisted on, without any particular view of its nature being implied. On these terms the personal self rather than the thought might be treated as the immediate datum in psychology. The universal conscious fact is not 'feelings and thoughts exist,' but 'I think' and 'I feel.'^[216] No psychology, at any rate, can question the *existence* of personal selves. The worst a psychology can do is so to interpret the nature of these selves as to rob them of their worth. A French writer, speaking of our ideas, says somewhere in a fit of anti-spiritualistic excitement that, misled by certain peculiarities which they display, we 'end by personifying' the procession which they make,—such personification being regarded by him as a great philosophic blunder on our part. It could only be a blunder if the notion of personality meant something essentially different from anything to be found in the mental procession. But if that procession be itself the very 'original' of the notion of personality, to personify it cannot possibly be wrong. It is already personified. There are no marks of personality to be gathered *aliunde*, and then found lacking in the train of thought. It has them all already; so that to whatever farther analysis we may subject that form of personal selfhood under which thoughts appear, it is, and must remain, true that the thoughts which psychology studies do continually tend to appear as parts of personal selves.

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I say 'tend to appear' rather than 'appear,' on account of those facts of sub-conscious personality, automatic writing, etc., of which we studied a few in the last chapter. The buried feelings and thoughts proved now to exist in hysterical anæsthetics, in recipients of post-hypnotic suggestion, etc., themselves are parts of *secondary personal selves*. These selves are for the most part very stupid and contracted, and are cut off at ordinary times from communication with the regular and normal self of the individual; but still they form conscious unities, have continuous memories, speak, write, invent distinct names for themselves, or adopt names that are suggested; and, in short, are entirely worthy of that title of secondary personalities which is now commonly given them. According to M. Janet these secondary personalities are always abnormal, and result from the splitting of what ought to be a single complete self into two parts, of which one lurks in the background whilst the other appears on the surface as the only self the man or woman has. For our present purpose it is unimportant whether this account of the origin of secondary selves is applicable to all possible cases of them or not, for it certainly is true of a large number of them. Now although the *size* of a secondary self thus formed will depend on the number of thoughts that are thus split-off from the main consciousness, the *form* of it tends to personality, and the later thoughts pertaining to it remember the earlier ones and adopt them as their own. M. Janet caught the actual moment of inspissation (so to speak) of one of these secondary personalities in his anæsthetic somnambulist Lucie. He found that when this young woman's attention was absorbed in conversation with a third party, her anæsthetic hand would write simple answers to questions whispered to her by himself. "Do you hear?" he asked. "No," was the unconsciously written reply. "But to answer you must hear." "Yes, quite so." "Then how do you manage?" "I don't know." "There must be some one who hears me." "Yes." "Who?" "Someone other than Lucie." "Ah! another person. Shall we give her a name?" "No." "Yes, it will be more convenient." "Well, Adrienne, then." "Once baptized, the subconscious personage," M. Janet continues, "grows more definitely outlined and displays better her psychological characters. In particular she shows us that she is conscious of the feelings excluded from the consciousness of the primary or normal personage. She it is who tells us that I am pinching the arm or touching the little finger in which Lucie for so long has had no tactile sensations."^[217]

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In other cases the adoption of the name by the secondary self is more spontaneous. I have seen a number of incipient automatic writers and mediums as yet imperfectly 'developed,'

who immediately and of their own accord write and speak in the name of departed spirits. These may be public characters, as Mozart, Faraday, or real persons formerly known to the subject, or altogether imaginary beings. Without prejudicing the question of real 'spirit-control' in the more developed sorts of trance-utterance, I incline to think that these (often deplorably unintelligent) rudimentary utterances are the work of an inferior fraction of the subject's own natural mind, set free from control by the rest, and working after a set pattern fixed by the prejudices of the social environment. In a spiritualistic community we get optimistic messages, whilst in an ignorant Catholic village the secondary personage calls itself by the name of a demon, and proffers blasphemies and obscenities, instead of telling us how happy it is in the summer-land.^[218]

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Beneath these tracts of thought, which, however rudimentary, are still organized selves with a memory, habits, and sense of their own identity, M. Janet thinks that the facts of catalepsy in hysteric patients drive us to suppose that there are thoughts quite unorganized and impersonal. A patient in cataleptic trance (which can be produced artificially in certain hypnotized subjects) is without memory on waking, and seems insensible and unconscious as long as the cataleptic condition lasts. If, however, one raises the arm of such a subject it stays in that position, and the whole body can thus be moulded like wax under the hands of the operator, retaining for a considerable time whatever attitude he communicates to it. In hysterics whose arm, for example, is anæsthetic, the same thing may happen. The anæsthetic arm may remain passively in positions which it is made to assume; or if the hand be taken and made to hold a pencil and trace a certain letter, it will continue tracing that letter indefinitely on the paper. These acts, until recently, were supposed to be accompanied by no consciousness at all: they were physiological reflexes. M. Janet considers with much more plausibility that feeling escorts them. The feeling is probably merely that of the position or movement of the limb, and it produces no more than its natural effects when it discharges into the motor centres which keep the position maintained, or the movement incessantly renewed.^[219] Such thoughts as these, says M. Janet, "are known by *no one*, for disaggregated sensations reduced to a state of mental dust are not synthesized in any personality."^[220] He admits, however, that these very same unutterably stupid thoughts tend to develop memory,—the cataleptic ere long moves her arm at a bare hint; so that they form no important exception to the law that all thought tends to assume the form of personal consciousness.

2) *Thought is in Constant Change.*

I do not mean necessarily that no one state of mind has any duration—even if true, that would be hard to establish. The change which I have more particularly in view is that which takes place in sensible intervals of time; and the result on which I wish to lay stress is this, that *no state once gone can recur and be identical with what it was before*. Let us begin with Mr. Shadworth Hodgson's description:

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"I go straight to the facts, without saying I go to perception, or sensation, or thought, or any special mode at all. What I find when I look at my consciousness at all is that what I cannot divest myself of, or not have in consciousness, if I have any consciousness at all, is a sequence of different feelings. I may shut my eyes and keep perfectly still, and try not to contribute anything of my own will; but whether I think or do not think, whether I perceive external things or not, I always have a succession of different feelings. Anything else that I may have also, of a more special character, comes in as parts of this succession, Not to have the succession of different feelings is not to be conscious at all.... The chain of consciousness is a sequence of *differents*."^[221]

Such a description as this can awaken no possible protest from any one. We all recognize as different great classes of our conscious states. Now we are seeing, now hearing; now reasoning, now willing; now recollecting, now expecting; now loving, now hating; and in a hundred other ways we know our minds to be alternately engaged. But all these are complex states. The aim of science is always to reduce complexity to simplicity; and in psychological science we have the celebrated 'theory of *ideas*' which, admitting the great difference among each other of what may be called concrete conditions of mind, seeks to show how this is all the resultant effect of variations in the *combination* of certain simple elements of consciousness that always remain the same. These mental atoms or molecules are what Locke called 'simple ideas.' Some of Locke's successors made out that the only simple ideas were the sensations strictly so called. Which ideas the simple ones may be does not, however, now concern us. It is enough that certain philosophers have thought they could see under the dissolving-view-appearance of the mind elementary facts of *any* sort that remained unchanged amid the flow.

And the view of these philosophers has been called little into question, for our common experience seems at first sight to corroborate it entirely. Are not the sensations we get from the same object, for example, always the same? Does not the same piano-key, struck with the same force, make us hear in the same way? Does not the same grass give us the same feeling of green, the same sky the same feeling of blue, and do we not get the same olfactory sensation no matter how many times we put our nose to the same flask of cologne? It seems a piece of metaphysical sophistry to suggest that we do not; and yet a close attention to the matter shows that *there is no proof that the same bodily sensation is ever got by us twice*.

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What is got twice is the same OBJECT. We hear the same *note* over and over again; we see the same *quality* of green, or smell the same objective perfume, or experience the same *species* of pain. The realities, concrete and abstract, physical and ideal, whose permanent existence we believe in, seem to be constantly coming up again before our thought, and lead us, in our carelessness, to suppose that our 'ideas' of them are the same ideas. When we come, some time later, to the chapter on Perception, we shall see how inveterate is our habit of not attending to sensations as subjective facts, but of simply using them as stepping-stones to pass over to the recognition of the realities whose presence they reveal. The grass out of the window now looks to me of the same green in the sun as in the shade, and yet a painter would have to paint one part of it dark brown, another part bright yellow, to give its real, sensational effect. We take no heed, as a rule, of the different way in which the same things look and sound and smell at different distances and under different circumstances. The sameness of the *things* is what we are concerned to ascertain; and any sensations that assure us of that will probably be considered in a rough way to be the same with each other. This is what makes off-hand testimony about the subjective identity of different sensations well-nigh worthless as a proof of the fact. The entire history of Sensation is a commentary on our inability to tell whether two sensations received apart are exactly alike. What appeals to our attention far more than the absolute quality or quantity of a given sensation is its *ratio* to whatever other sensations we may have at the same time. When everything is dark a somewhat less dark sensation makes us see an object white. Helmholtz calculates that the white marble painted in a picture representing an architectural view by moonlight is, when seen by daylight, from ten to twenty thousand times brighter than the real moonlit marble would be.^[222]

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Such a difference as this could never have been *sensibly* learned; it had to be inferred from a series of indirect considerations. There are facts which make us believe that our sensibility is altering all the time, so that the same object cannot easily give us the same sensation over again. The eye's sensibility to light is at its maximum when the eye is first exposed, and blunts itself with surprising rapidity. A long night's sleep will make it see things twice as brightly on wakening, as simple rest by closure will make it see them later in the day.^[223] We feel things differently according as we are sleepy or awake, hungry or full, fresh or tired;

differently at night and in the morning, differently in summer and in winter, and above all things differently in childhood, manhood, and old age. Yet we never doubt that our feelings reveal the same world, with the same sensible qualities and the same sensible things occupying it. The difference of the sensibility is shown best by the difference of our emotion about the things from one age to another, or when we are in different organic moods. What was bright and exciting becomes weary, flat, and unprofitable. The bird's song is tedious, the breeze is mournful, the sky is sad.

To these indirect presumptions that our sensations, following the mutations of our capacity for feeling, are always undergoing an essential change, must be added another presumption, based on what must happen in the brain. Every sensation corresponds to some cerebral action. For an identical sensation to recur it would have to occur the second time *in an unmodified brain*. But as this, strictly speaking, is a physiological impossibility, so is an unmodified feeling an impossibility; for to every brain-modification, however small, must correspond a change of equal amount in the feeling which the brain subserves.

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All this would be true if even sensations came to us pure and single and not combined into 'things.' Even then we should have to confess that, however we might in ordinary conversation speak of getting the same sensation again, we never in strict theoretic accuracy could do so; and that whatever was true of the river of life, of the river of elementary feeling, it would certainly be true to say, like Heraclitus, that we never descend twice into the same stream.

But if the assumption of 'simple ideas of sensation' recurring in immutable shape is so easily shown to be baseless, how much more baseless is the assumption of immutability in the larger masses of our thought!

For there it is obvious and palpable that our state of mind is never precisely the same. Every thought we have of a given fact is, strictly speaking, unique, and only bears a resemblance of kind with our other thoughts of the same fact. When the identical fact recurs, we *must* think of it in a fresh manner, see it under a somewhat different angle, apprehend it in different relations from those in which it last appeared. And the thought by which we cognize it is the thought of it-in-those-relations, a thought suffused with the consciousness of all that dim context. Often we are ourselves struck at the strange differences in our successive views of the same thing. We wonder how we ever could have opined as we did last month about a certain matter. We have outgrown the possibility of that state of mind, we know not how. From one year to another we see things in new lights. What was unreal has grown real, and what was exciting is insipid. The friends we used to care the world for are shrunken to shadows; the women, once so divine, the stars, the woods, and the waters, how now so dull and common! the young girls that brought an aura of infinity, at present hardly distinguishable existences; pictures so empty; and as for the books, what *was* there to find so mysteriously significant in Goethe, or in John Mill so full of weight? Instead of all this, more zestful than ever is the work, the work; and fuller and deeper the import of common duties and of common goods.

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But what here strikes us so forcibly on the flagrant scale exists on every scale, down to the imperceptible transition from one hour's outlook to that of the next. Experience is remoulding us every moment, and our mental reaction on every given thing is really a resultant of our experience of the whole world up to that date. The analogies of brain-physiology must again be appealed to to corroborate our view.

Our earlier chapters have taught us to believe that, whilst we think, our brain changes, and that, like the aurora borealis, its whole internal equilibrium shifts with every pulse of change. The precise nature of the shifting at a given moment is a product of many factors. The accidental state of local nutrition or blood-supply may be among them. But just as one of them certainly is the influence of outward objects on the sense-organs during the moment, so is another certainly the very special susceptibility in which the organ has been left at that

moment by all it has gone through in the past. Every brain-state is partly determined by the nature of this entire past succession. Alter the latter in any part, and the brain-state must be somewhat different. Each present brain-state is a record in which the eye of Omniscience might read all the foregone history of its owner. It is out of the question, then, that any total brain-state should identically recur. Something like it may recur; but to suppose *it* to recur would be equivalent to the absurd admission that all the states that had intervened between its two appearances had been pure nonentities, and that the organ after their passage was exactly as it was before. And (to consider shorter periods) just as, in the senses, an impression feels very differently according to what has preceded it; as one color succeeding another is modified by the contrast, silence sounds delicious after noise, and a note, when the scale is sung up, sounds unlike itself when the scale is sung down; as the presence of certain lines in a figure changes the apparent form of the other lines, and as in music the whole æsthetic effect comes from the manner in which one set of sounds alters our feeling of another; so, in thought, we must admit that those portions of the brain that have just been maximally excited retain a kind of soreness which is a condition of our present consciousness, a codeterminant of how and what we now shall feel.^[224]

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Ever some tracts are waning in tension, some waxing, whilst others actively discharge. The states of tension have as positive an influence as any in determining the total condition, and in deciding what the *psychosis* shall be. All we know of submaximal nerve-irritations, and of the summation of apparently ineffective stimuli, tends to show that *no* changes in the brain are physiologically ineffective, and that presumably none are bare of psychological result. But as the brain-tension shifts from one relative state of equilibrium to another, like the gyrations of a kaleidoscope, now rapid and now slow, is it likely that its faithful psychic concomitant is heavier-footed than itself, and that it cannot match each one of the organ's irradiations by a shifting inward iridescence of its own? But if it can do this, its inward iridescences must be infinite, for the brain-redistributions are in infinite variety. If so coarse a thing as a telephone-plate can be made to thrill for years and never reduplicate its inward condition, how much more must this be the case with the infinitely delicate brain?

I am sure that this concrete and total manner of regarding the mind's changes is the only true manner, difficult as it may be to carry it out in detail. If anything seems obscure about it, it will grow clearer as we advance. Meanwhile, if it be true, it is certainly also true that no two 'ideas' are ever exactly the same, which is the proposition we started to prove. The proposition is more important theoretically than it at first sight seems. For it makes it already impossible for us to follow obediently in the footprints of either the Lockian or the Herbartian school, schools which have had almost unlimited influence in Germany and among ourselves. No doubt it is often *convenient* to formulate the mental facts in an atomistic sort of way, and to treat the higher states of consciousness as if they were all built out of unchanging simple ideas. It is convenient often to treat curves as if they were composed of small straight lines, and electricity and nerve-force as if they were fluids. But in the one case as in the other we must never forget that we are talking symbolically, and that there is nothing in nature to answer to our words. *A permanently existing 'idea' or 'Vorstellung' which makes its appearance before the footlights of consciousness at periodical intervals, is as mythological an entity as the Jack of Spades.*

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What makes it convenient to use the mythological formulas is the whole organization of speech, which, as was remarked a while ago, was not made by psychologists, but by men who were as a rule only interested in the facts their mental states revealed. They only spoke of their states as *ideas of this or of that thing*. What wonder, then, that the thought is most easily conceived under the law of the thing whose name it bears! If the thing is composed of parts, then we suppose that the thought of the thing must be composed of the thoughts of the parts. If one part of the thing have appeared in the same thing or in other things on former occasions, why then we must be having even now the very same 'idea' of that part which was there on those occasions. If the thing is simple, its thought is simple. If it is

multitudinous, it must require a multitude of thoughts to think it. If a succession, only a succession of thoughts can know it. If permanent, its thought is permanent. And so on *ad libitum*. What after all is so natural as to assume that one object, called by one name, should be known by one affection of the mind? But, if language must thus influence us, the agglutinative languages, and even Greek and Latin with their declensions, would be the better guides. Names did not appear in them inalterable, but changed their shape to suit the context in which they lay. It must have been easier then than now to conceive of the same object as being thought of at different times in non-identical conscious states. [Pg 237]

This, too, will grow clearer as we proceed. Meanwhile a necessary consequence of the belief in permanent self-identical psychic facts that absent themselves and recur periodically is the Humian doctrine that our thought is composed of separate independent parts and is not a sensibly continuous stream. That this doctrine entirely misrepresents the natural appearances is what I next shall try to show.

3) *Within each personal consciousness, thought is sensibly continuous.*

I can only define 'continuous' as that which is without breach, crack, or division. I have already said that the breach from one mind to another is perhaps the greatest breach in nature. The only breaches that can well be conceived to occur within the limits of a single mind would either be *interruptions*, *time-gaps* during which the consciousness went out altogether to come into existence again at a later moment; or they would be breaks in the *quality*, or content, of the thought, so abrupt that the segment that followed had no connection whatever with the one that went before. The proposition that within each personal consciousness thought feels continuous, means two things:

1. That even where there is a time-gap the consciousness after it feels as if it belonged together with the consciousness before it, as another part of the same self;
2. That the changes from one moment to another in the quality of the consciousness are never absolutely abrupt.

The case of the time-gaps, as the simplest, shall be taken first. And first of all a word about time-gaps of which the consciousness may not be itself aware.

On [page 200](#) we saw that such time-gaps existed, and that they might be more numerous than is usually supposed. If the consciousness is not aware of them, it cannot feel them as interruptions. In the unconsciousness produced by nitrous oxide and other anæsthetics, in that of epilepsy and fainting, the broken edges of the sentient life may meet and merge over the gap, much as the feelings of space of the opposite margins of the 'blind spot' meet and merge over that objective interruption to the sensitiveness of the eye. Such consciousness as this, whatever it be for the onlooking psychologist, is for itself unbroken. It *feels* unbroken; a waking day of it is sensibly a unit as long as that day lasts, in the sense in which the hours themselves are units, as having all their parts next each other, with no intrusive alien substance between. To expect the consciousness to feel the interruptions of its objective continuity as gaps, would be like expecting the eye to feel a gap of silence because it does not hear, or the ear to feel a gap of darkness because it does not see. So much for the gaps that are unfelt. [Pg 238]

With the felt gaps the case is different. On waking from sleep, we usually know that we have been unconscious, and we often have an accurate judgment of how long. The judgment here is certainly an inference from sensible signs, and its ease is due to long practice in the particular field.^[225] The result of it, however, is that the consciousness is, *for itself*, not what it was in the former case, but interrupted and discontinuous, in the mere sense of the words. But in the other sense of continuity, the sense of the parts being inwardly connected and belonging together because they are parts of a common whole, the consciousness remains

sensibly continuous and one. What now is the common whole? The natural name for it is *myself, I, or me*.

When Paul and Peter wake up in the same bed, and recognize that they have been asleep, each one of them mentally reaches back and makes connection with but *one* of the two streams of thought which were broken by the sleeping hours. As the current of an electrode buried in the ground unerringly finds its way to its own similarly buried mate, across no matter how much intervening earth; so Peter's present instantly finds out Peter's past, and never by mistake knits itself on to that of Paul. Paul's thought in turn is as little liable to go astray. The past thought of Peter is appropriated by the present Peter alone. He may have a *knowledge*, and a correct one too, of what Paul's last drowsy states of mind were as he sank into sleep, but it is an entirely different sort of knowledge from that which he has of his own last states. He *remembers* his own states, whilst he only *conceives* Paul's. Remembrance is like direct feeling; its object is suffused with a warmth and intimacy to which no object of mere conception ever attains. This quality of warmth and intimacy and immediacy is what Peter's *present* thought also possesses for itself. So sure as this present is *me*, is *mine*, it says, so sure is anything else that comes with the same warmth and intimacy and immediacy, *me* and *mine*. What the qualities called warmth and intimacy may in themselves be will have to be matter for future consideration. But whatever past feelings appear with those qualities must be admitted to receive the greeting of the present mental state, to be owned by it, and accepted as belonging together with it in a common self. This community of self is what the time-gap cannot break in twain, and is why a present thought, although not ignorant of the time-gap, can still regard itself as continuous with certain chosen portions of the past.

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Consciousness, then, does not appear to itself chopped up in bits. Such words as 'chain' or 'train' do not describe it fitly as it presents itself in the first instance. It is nothing jointed; it flows. A 'river' or a 'stream' are the metaphors by which it is most naturally described. *In talking of it hereafter, let us call it the stream of thought, of consciousness, or of subjective life.*

But now there appears, even within the limits of the same self, and between thoughts all of which alike have this same sense of belonging together, a kind of jointing and separateness among the parts, of which this statement seems to take no account. I refer to the breaks that are produced by sudden *contrasts in the quality* of the successive segments of the stream of thought. If the words 'chain' and 'train' had no natural fitness in them, how came such words to be used at all? Does not a loud explosion rend the consciousness upon which it abruptly breaks, in twain? Does not every sudden shock, appearance of a new object, or change in a sensation, create a real interruption, sensibly felt as such, which cuts the conscious stream across at the moment at which it appears? Do not such interruptions smite us every hour of our lives, and have we the right, in their presence, still to call our consciousness a continuous stream?

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This objection is based partly on a confusion and partly on a superficial introspective view.

The confusion is between the thoughts themselves, taken as subjective facts, and the things of which they are aware. It is natural to make this confusion, but easy to avoid it when once put on one's guard. The things are discrete and discontinuous; they do pass before us in a train or chain, making often explosive appearances and rending each other in twain. But their comings and goings and contrasts no more break the flow of the thought that thinks them than they break the time and the space in which they lie. A silence may be broken by a thunder-clap, and we may be so stunned and confused for a moment by the shock as to give no instant account to ourselves of what has happened. But that very confusion is a mental state, and a state that passes us straight over from the silence to the sound. The transition

between the thought of one object and the thought of another is no more a break in the *thought* than a joint in a bamboo is a break in the wood. It is a part of the *consciousness* as much as the joint is a part of the *bamboo*.

The superficial introspective view is the overlooking, even when the things are contrasted with each other most violently, of the large amount of affinity that may still remain between the thoughts by whose means they are cognized. Into the awareness of the thunder itself the awareness of the previous silence creeps and continues; for what we hear when the thunder crashes is not thunder *pure*, but thunder-breaking-upon-silence-and-contrasting-with-it.^[226]

Our feeling of the same objective thunder, coming in this way, is quite different from what it would be were the thunder a continuation of previous thunder. The thunder itself we believe to abolish and exclude the silence; but the *feeling* of the thunder is also a feeling of the silence as just gone; and it would be difficult to find in the actual concrete consciousness of man a feeling so limited to the present as not to have an inkling of anything that went before. Here, again, language works against our perception of the truth. We name our thoughts simply, each after its thing, as if each knew its own thing and nothing else. What each really knows is clearly the thing it is named for, with dimly perhaps a thousand other things. It ought to be named after all of them, but it never is. Some of them are always things known a moment ago more clearly; others are things to be known more clearly a moment hence.^[227]

Our own bodily position, attitude, condition, is one of the things of which *some* awareness, however inattentive, invariably accompanies the knowledge of whatever else we know. We think; and as we think we feel our bodily selves as the seat of the thinking. If the thinking be *our* thinking, it must be suffused through all its parts with that peculiar warmth and intimacy that make it come as ours. Whether the warmth and intimacy be anything more than the feeling of the same old body always there, is a matter for the next chapter to decide. *Whatever* the content of the ego may be, it is habitually felt *with* everything else by us humans, and must form a *liaison* between all the things of which we become successively aware.^[228]

On this gradualness in the changes of our mental content the principles of nerve-action can throw some more light. When studying, in [Chapter III](#), the summation of nervous activities, we saw that no state of the brain can be supposed instantly to die away. If a new state comes, the inertia of the old state will still be there and modify the result accordingly. Of course we cannot tell, in our ignorance, what in each instance the modifications ought to be. The commonest modifications in sense-perception are known as the phenomena of contrast. In æsthetics they are the feelings of delight or displeasure which certain particular orders in a series of impressions give. In thought, strictly and narrowly so called, they are unquestionably that consciousness of the *whence* and the *whither* that always accompanies its flows. If recently the brain-tract *a* was vividly excited, and then *b*, and now vividly *c*, the total present consciousness is not produced simply by *c*'s excitement, but also by the dying vibrations of *a* and *b* as well. If we want to represent the brain-process we must write it thus: ${}_a b^c$ —three different processes coexisting, and correlated with them a thought which is no one of the three thoughts which they would have produced had each of them occurred alone. But whatever this fourth thought may exactly be, it seems impossible that it should not be something *like* each of the three other thoughts whose tracts are concerned in its production, though in a fast-waning phase.

It all goes back to what we said in another connection only a few pages ago ([p. 233](#)). As the total neurosis changes, so does the total psychosis change. But as the changes of neurosis are never absolutely discontinuous, so must the successive psychoses shade gradually into each other, although their *rate* of change may be much faster at one moment than at the next.

This difference in the rate of change lies at the basis of a difference of subjective states of which we ought immediately to speak. When the rate is slow we are aware of the object of our thought in a comparatively restful and stable way. When rapid, we are aware of a passage, a relation, a transition *from* it, or *between* it and something else. As we take, in fact, a general view of the wonderful stream of our consciousness, what strikes us first is this different pace of its parts. Like a bird's life, it seems to be made of an alternation of flights and perchings. The rhythm of language expresses this, where every thought is expressed in a sentence, and every sentence closed by a period. The resting-places are usually occupied by sensorial imaginations of some sort, whose peculiarity is that they can be held before the mind for an indefinite time, and contemplated without changing; the places of flight are filled with thoughts of relations, static or dynamic, that for the most part obtain between the matters contemplated in the periods of comparative rest.

Let us call the resting-places the 'substantive parts,' and the places of flight the 'transitive parts,' of the stream of thought. It then appears that the main end of our thinking is at all times the attainment of some other substantive part than the one from which we have just been dislodged. And we may say that the main use of the transitive parts is to lead us from one substantive conclusion to another.

Now it is very difficult, introspectively, to see the transitive parts for what they really are. If they are but flights to a conclusion, stopping them to look at them before the conclusion is reached is really annihilating them. Whilst if we wait till the conclusion *be* reached, it so exceeds them in vigor and stability that it quite eclipses and swallows them up in its glare. Let anyone try to cut a thought across in the middle and get a look at its section, and he will see how difficult the introspective observation of the transitive tracts is. The rush of the thought is so headlong that it almost always brings us up at the conclusion before we can arrest it. Or if our purpose is nimble enough and we do arrest it, it ceases forthwith to be itself. As a snow-flake crystal caught in the warm hand is no longer a crystal but a drop, so, instead of catching the feeling of relation moving to its term, we find we have caught some substantive thing, usually the last word we were pronouncing, statically taken, and with its function, tendency, and particular meaning in the sentence quite evaporated. The attempt at introspective analysis in these cases is in fact like seizing a spinning top to catch its motion, or trying to turn up the gas quickly enough to see how the darkness looks. And the challenge to *produce* these psychoses, which is sure to be thrown by doubting psychologists at anyone who contends for their existence, is as unfair as Zeno's treatment of the advocates of motion, when, asking them to point out in what place an arrow *is* when it moves, he argues the falsity of their thesis from their inability to make to so preposterous a question an immediate reply.

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The results of this introspective difficulty are baleful. If to hold fast and observe the transitive parts of thought's stream be so hard, then the great blunder to which all schools are liable must be the failure to register them, and the undue emphasizing of the more substantive parts of the stream. Were we not ourselves a moment since in danger of ignoring any feeling transitive between the silence and the thunder, and of treating their boundary as a sort of break in the mind? Now such ignoring as this has historically worked in two ways. One set of thinkers have been led by it to *Sensationalism*. Unable to lay their hands on any coarse feelings corresponding to the innumerable relations and forms of connection between the facts of the world, finding no *named* subjective modifications mirroring such relations, they have for the most part denied that feelings of relation exist, and many of them, like Hume, have gone so far as to deny the reality of most relations *out* of the mind as well as in it. Substantive psychoses, sensations and their copies and derivatives, juxtaposed like dominoes in a game, but really separate, everything else verbal illusion,—such is the upshot of this view.^[229] The *Intellectualists*, on the other hand, unable to give up the reality of relations *extra mentem*, but equally unable to point to any distinct substantive feelings in which they were known, have made the same admission that the feelings do not exist. But

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they have drawn an opposite conclusion. The relations must be known, they say, in something that is no feeling, no mental modification continuous and consubstantial with the subjective tissue out of which sensations and other substantive states are made. They are known, these relations, by something that lies on an entirely different plane, by an *actus purus* of Thought, Intellect, or Reason, all written with capitals and considered to mean something unutterably superior to any fact of sensibility whatever.

But from our point of view both Intellectualists and Sensationalists are wrong. If there be such things as feelings at all, *then so surely as relations between objects exist in rerum naturâ, so surely, and more surely, do feelings exist to which these relations are known.* There is not a conjunction or a preposition, and hardly an adverbial phrase, syntactic form, or inflection of voice, in human speech, that does not express some shading or other of relation which we at some moment actually feel to exist between the larger objects of our thought. If we speak objectively, it is the real relations that appear revealed; if we speak subjectively, it is the stream of consciousness that matches each of them by an inward coloring of its own. In either case the relations are numberless, and no existing language is capable of doing justice to all their shades.

We ought to say a feeling of *and*, a feeling of *if*, a feeling of *but*, and a feeling of *by*, quite as readily as we say a feeling of *blue* or a feeling of *cold*. Yet we do not: so inveterate has our habit become of recognizing the existence of the substantive parts alone, that language almost refuses to lend itself to any other use. The Empiricists have always dwelt on its influence in making us suppose that where we have a separate name, a separate thing must needs be there to correspond with it; and they have rightly denied the existence of the mob of abstract entities, principles, and forces, in whose favor no other evidence than this could be brought up. But they have said nothing of that obverse error, of which we said a word in Chapter VII, (see [p. 195](#)), of supposing that where there is *no* name no entity can exist. All *dumb* or anonymous psychic states have, owing to this error, been coolly suppressed; or, if recognized at all, have been named after the substantive perception they led to, as thoughts 'about' this object or 'about' that, the stolid word *about* engulfing all their delicate idiosyncrasies in its monotonous sound. Thus the greater and greater accentuation and isolation of the substantive parts have continually gone on.

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Once more take a look at the brain. We believe the brain to be an organ whose internal equilibrium is always in a state of change,—the change affecting every part. The pulses of change are doubtless more violent in one place than in another, their rhythm more rapid at this time than at that. As in a kaleidoscope revolving at a uniform rate, although the figures are always rearranging themselves, there are instants during which the transformation seems minute and interstitial and almost absent, followed by others when it shoots with magical rapidity, relatively stable forms thus alternating with forms we should not distinguish if seen again; so in the brain the perpetual rearrangement must result in some forms of tension lingering relatively long, whilst others simply come and pass. But if consciousness corresponds to the fact of rearrangement itself, why, if the rearrangement stop not, should the consciousness ever cease? And if a lingering rearrangement brings with it one kind of consciousness, why should not a swift rearrangement bring another kind of consciousness as peculiar as the rearrangement itself? The lingering consciousnesses, if of simple objects, we call 'sensations' or 'images,' according as they are vivid or faint; if of complex objects, we call them 'percepts' when vivid, 'concepts' or 'thoughts' when faint. For the swift consciousnesses we have only those names of 'transitive states,' or 'feelings of relation,' which we have used.^[230] As the brain-changes are continuous, so do all these consciousnesses melt into each other like dissolving views. Properly they are but one protracted consciousness, one unbroken stream.

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Feelings of Tendency.

So much for the transitive states. But there are other unnamed states or qualities of states that are just as important and just as cognitive as they, and just as much unrecognized by the traditional sensationalist and intellectualist philosophies of mind. The first fails to find them at all, the second finds their *cognitive function*, but denies that anything in the way of *feeling* has a share in bringing it about. Examples will make clear what these inarticulate psychoses, due to waxing and waning excitements of the brain, are like.^[231]

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Suppose three successive persons say to us: 'Wait!' 'Hark!' 'Look!' Our consciousness is thrown into three quite different attitudes of expectancy, although no definite object is before it in any one of the three cases. Leaving out different actual bodily attitudes, and leaving out the reverberating images of the three words, which are of course diverse, probably no one will deny the existence of a residual conscious affection, a sense of the direction from which an impression is about to come, although no positive impression is yet there. Meanwhile we have no names for the psychoses in question but the names hark, look, and wait.

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Suppose we try to recall a forgotten name. The state of our consciousness is peculiar. There is a gap therein; but no mere gap. It is a gap that is intensely active. A sort of wraith of the name is in it, beckoning us in a given direction, making us at moments tingle with the sense of our closeness, and then letting us sink back without the longed-for term. If wrong names are proposed to us, this singularly definite gap acts immediately so as to negate them. They do not fit into its mould. And the gap of one word does not feel like the gap of another, all empty of content as both might seem necessarily to be when described as gaps. When I vainly try to recall the name of Spalding, my consciousness is far removed from what it is when I vainly try to recall the name of Bowles. Here some ingenious persons will say: "How *can* the two consciousnesses be different when the terms which might make them different are not there? All that is there, so long as the effort to recall is vain, is the bare effort itself. How should that differ in the two cases? You are making it seem to differ by prematurely filling it out with the different names, although these, by the hypothesis, have not yet come. Stick to the two efforts as they are, without naming them after facts not yet existent, and you'll be quite unable to designate any point in which they differ." Designate, truly enough. We can only designate the difference by borrowing the names of objects not yet in the mind. Which is to say that our psychological vocabulary is wholly inadequate to name the differences that exist, even such strong differences as these. But namelessness is compatible with existence. There are innumerable consciousnesses of emptiness, no one of which taken in itself has a name, but all different from each other. The ordinary way is to assume that they are all emptinesses of consciousness, and so the same state. But the feeling of an absence is *toto caelo* other than the absence of a feeling. It is an intense feeling. The rhythm of a lost word may be there without a sound to clothe it; or the evanescent sense of something which is the initial vowel or consonant may mock us fitfully, without growing more distinct. Every one must know the tantalizing effect of the blank rhythm of some forgotten verse, restlessly dancing in one's mind, striving to be filled out with words.

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Again, what is the strange difference between an experience tasted for the first time and the same experience recognized as familiar, as having been enjoyed before, though we cannot name it or say where or when? A tune, an odor, a flavor sometimes carry this inarticulate feeling of their familiarity so deep into our consciousness that we are fairly shaken by its mysterious emotional power. But strong and characteristic as this psychosis is—it probably is due to the submaximal excitement of wide-spreading associational brain-tracts—the only name we have for all its shadings is 'sense of familiarity.'

When we read such phrases as 'naught but,' 'either one or the other,' '*a* is *b*, but,' 'although it is, nevertheless,' 'it is an excluded middle, there is no *tertium quid*,' and a host of other verbal skeletons of logical relation, is it true that there is nothing more in our minds than the words themselves as they pass? What then is the meaning of the words which we think we understand as we read? What makes that meaning different in one phrase from what it is in

the other? 'Who?' 'When?' 'Where?' Is the difference of felt meaning in these interrogatives nothing more than their difference of sound? And is it not (just like the difference of sound itself) known and understood in an affection of consciousness correlative to it, though so impalpable to direct examination? Is not the same true of such negatives as 'no,' 'never,' 'not yet'?

The truth is that large tracts of human speech are nothing but *signs of direction* in thought, of which direction we nevertheless have an acutely discriminative sense, though no definite sensorial image plays any part in it whatsoever. Sensorial images are stable psychic facts; we can hold them still and look at them as long as we like. These bare images of logical movement, on the contrary, are psychic transitions, always on the wing, so to speak, and not to be glimpsed except in flight. Their function is to lead from one set of images to another. As they pass, we feel both the waxing and the waning images in a way altogether peculiar and a way quite different from the way of their full presence. If we try to hold fast the feeling of direction, the full presence comes and the feeling of direction is lost. The blank verbal scheme of the logical movement gives us the fleeting sense of the movement as we read it, quite as well as does a rational sentence awakening definite imaginations by its words.

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What is that first instantaneous glimpse of some one's meaning which we have, when in vulgar phrase we say we 'twig' it? Surely an altogether specific affection of our mind. And has the reader never asked himself what kind of a mental fact is his *intention of saying a thing* before he has said it? It is an entirely definite intention, distinct from all other intentions, an absolutely distinct state of consciousness, therefore; and yet how much of it consists of definite sensorial images, either of words or of things? Hardly anything! Linger, and the words and things come into the mind; the anticipatory intention, the divination is there no more. But as the words that replace it arrive, it welcomes them successively and calls them right if they agree with it, it rejects them and calls them wrong if they do not. It has therefore a nature of its own of the most positive sort, and yet what can we say about it without using words that belong to the later mental facts that replace it? The intention *to-say-so-and-so* is the only name it can receive. One may admit that a good third of our psychic life consists in these rapid premonitory perspective views of schemes of thought not yet articulate. How comes it about that a man reading something aloud for the first time is able immediately to emphasize all his words aright, unless from the very first he have a sense of at least the form of the sentence yet to come, which sense is fused with his consciousness of the present word, and modifies its emphasis in his mind so as to make him give it the proper accent as he utters it? Emphasis of this kind is almost altogether a matter of grammatical construction. If we read 'no more' we expect presently to come upon a 'than'; if we read 'however' at the outset of a sentence it is a 'yet,' a 'still,' or a 'nevertheless,' that we expect. A noun in a certain position demands a verb in a certain mood and number, in another position it expects a relative pronoun. Adjectives call for nouns, verbs for adverbs, etc., etc. And this foreboding of the coming grammatical scheme combined with each successive uttered word is so practically accurate that a reader incapable of understanding four ideas of the book he is reading aloud, can nevertheless read it with the most delicately modulated expression of intelligence.

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Some will interpret these facts by calling them all cases in which certain images, by laws of association, awaken others so very rapidly that we think afterwards we felt the very *tendencies* of the nascent images to arise, before they were actually there. For this school the only possible materials of consciousness are images of a perfectly definite nature. Tendencies exist, but they are facts for the outside psychologist rather than for the subject of the observation. The tendency is thus a *psychical zero*; only its *results* are felt.

Now what I contend for, and accumulate examples to show, is that 'tendencies' are not only descriptions from without, but that they are among the *objects* of the stream, which is thus aware of them from within, and must be described as in very large measure constituted of

feelings of tendency, often so vague that we are unable to name them at all. It is, in short, the re-instatement of the vague to its proper place in our mental life which I am so anxious to press on the attention. Mr. Galton and Prof. Huxley have, as we shall see in Chapter XVIII, made one step in advance in exploding the ridiculous theory of Hume and Berkeley that we can have no images but of perfectly definite things. Another is made in the overthrow of the equally ridiculous notion that, whilst simple objective qualities are revealed to our knowledge in subjective feelings, relations are not. But these reforms are not half sweeping and radical enough. What must be admitted is that the definite images of traditional psychology form but the very smallest part of our minds as they actually live. The traditional psychology talks like one who should say a river consists of nothing but pailsful, spoonsful, quartpotsful, barrelsful, and other moulded forms of water. Even were the pails and the pots all actually standing in the stream, still between them the free water would continue to flow. It is just this free water of consciousness that psychologists resolutely overlook. Every definite image in the mind is steeped and dyed in the free water that flows round it. With it goes the sense of its relations, near and remote, the dying echo of whence it came to us, the dawning sense of whither it is to lead. The significance, the value, of the image is all in this halo or penumbra that surrounds and escorts it,—or rather that is fused into one with it and has become bone of its bone and flesh of its flesh; leaving it, it is true, an image of the same *thing* it was before, but making it an image of that thing newly taken and freshly understood.

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What is that shadowy scheme of the 'form' of an opera, play, or book, which remains in our mind and on which we pass judgment when the actual thing is done? What is our notion of a scientific or philosophical system? Great thinkers have vast premonitory glimpses of schemes of relation between terms, which hardly even as verbal images enter the mind, so rapid is the whole process.^[232] We all of us have this permanent consciousness of whither our thought is going. It is a feeling like any other, a feeling of what thoughts are next to arise, before they have arisen. This field of view of consciousness varies very much in extent, depending largely on the degree of mental freshness or fatigue. When very fresh, our minds carry an immense horizon with them. The present image shoots its perspective far before it, irradiating in advance the regions in which lie the thoughts as yet unborn. Under ordinary conditions the halo of felt relations is much more circumscribed. And in states of extreme brain-fag the horizon is narrowed almost to the passing word,—the associative machinery, however, providing for the next word turning up in orderly sequence, until at last the tired thinker is led to some kind of a conclusion. At certain moments he may find himself doubting whether his thoughts have not come to a full stop; but the vague sense of a *plus ultra* makes him ever struggle on towards a more definite expression of what it may be; whilst the slowness of his utterance shows how difficult, under such conditions, the labor of thinking must be.

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The awareness that our *definite* thought has come to a stop is an entirely different thing from the awareness that our thought is definitively completed. The expression of the latter state of mind is the falling inflection which betokens that the sentence is ended, and silence. The expression of the former state is 'hemming and hawing,' or else such phrases as '*et cetera*,' or 'and so forth.' But notice that every part of the sentence to be left incomplete feels differently as it passes, by reason of the premonition we have that we shall be unable to end it. The 'and so forth' casts its shadow back, and is as integral a part of the object of the thought as the distinctest of images would be.

Again, when we use a common noun, such as *man*, in a universal sense, as signifying all possible men, we are fully aware of this intention on our part, and distinguish it carefully from our intention when we mean a certain group of men, or a solitary individual before us. In the chapter on Conception we shall see how important this difference of intention is. It casts its influence over the whole of the sentence, both before and after the spot in which the word *man* is used.

Nothing is easier than to symbolize all these facts in terms of brain-action. Just as the echo of the *whence*, the sense of the starting point of our thought, is probably due to the dying excitement of processes but a moment since vividly aroused; so the sense of the whither, the foretaste of the terminus, must be due to the waxing excitement of tracts or processes which, a moment hence, will be the cerebral correlatives of some thing which a moment hence will be vividly present to the thought. Represented by a curve, the neurosis underlying consciousness must at any moment be like this:

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FIG. 27.

Each point of the horizontal line stands for some brain-tract or process. The height of the curve above the line stands for the intensity of the process. All the processes are *present*, in the intensities shown by the curve. But those before the latter's apex *were* more intense a moment ago; those after it *will be* more intense a moment hence. If I recite *a, b, c, d, e, f, g*, at the moment of uttering *d*, neither *a, b, c*, nor *e, f, g*, are out of my consciousness altogether, but both, after their respective fashions, 'mix their dim lights' with the stronger one of the *d*, because their neuroses are both awake in some degree.

There is a common class of mistakes which shows how brain-processes begin to be excited before the thoughts attached to them are *due*—due, that is, in substantive and vivid form. I mean those mistakes of speech or writing by which, in Dr. Carpenter's words, "we mispronounce or misspell a word, by introducing into it a letter or syllable of some other, whose turn is shortly to come; or, it may be, the whole of the anticipated word is substituted for the one which ought to have been expressed."^[233] In these cases one of two things must have happened: either some local accident of nutrition *blocks* the process that is *due*, so that other processes discharge that ought as yet to be but nascently aroused; or some opposite local accident *further*s the *latter processes* and makes them explode before their time. In the chapter on Association of Ideas, numerous instances will come before us of the actual effect on consciousness of neuroses not yet maximally aroused.

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It is just like the 'overtones' in music. Different instruments give the 'same note,' but each in a different voice, because each gives more than that note, namely, various upper harmonics of it which differ from one instrument to another. They are not separately heard by the ear; they blend with the fundamental note, and suffuse it, and alter it; and even so do the waxing and waning brain-processes at every moment blend with and suffuse and alter the psychic effect of the processes which are at their culminating point.

Let us use the words *psychic overtone*, *suffusion*, or *fringe*, to designate the influence of a faint brain-process upon our thought, as it makes it aware of relations and objects but dimly perceived.^[234]

If we then consider the *cognitive function* of different states of mind, we may feel assured that the difference between those that are mere 'acquaintance,' and those that are 'knowledges-about' (see p. 221) is reducible almost entirely to the absence or presence of psychic fringes or overtones. Knowledge *about* a thing is knowledge of its relations. Acquaintance with it is limitation to the bare impression which it makes. Of most of its relations we are only aware in the penumbral nascent way of a 'fringe' of unarticulated

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affinities about it. And, before passing to the next topic in order, I must say a little of this sense of affinity, as itself one of the most interesting features of the subjective stream.

In all our voluntary thinking there is some topic or subject about which all the members of the thought revolve. Half the time this topic is a problem, a gap we cannot yet fill with a definite picture, word, or phrase, but which, in the manner described some time back, influences us in an intensely active and determinate psychic way. Whatever may be the images and phrases that pass before us, we feel their relation to this aching gap. To fill it up is our thoughts' destiny. Some bring us nearer to that consummation. Some the gap negates as quite irrelevant. Each swims in a felt fringe of relations of which the aforesaid gap is the term. Or instead of a definite gap we may merely carry a mood of interest about with us. Then, however vague the mood, it will still act in the same way, throwing a mantle of felt affinity over such representations, entering the mind, as suit it, and tingeing with the feeling of tediousness or discord all those with which it has no concern.

Relation, then, to our topic or interest is constantly felt in the fringe, and particularly the relation of harmony and discord, of furtherance or hindrance of the topic. When the sense of furtherance is there, we are 'all right;' with the sense of hindrance we are dissatisfied and perplexed, and cast about us for other thoughts. Now *any* thought the quality of whose fringe lets us feel ourselves 'all right,' is an acceptable member of our thinking, whatever kind of thought it may otherwise be. Provided we only feel it to have a place in the scheme of relations in which the interesting topic also lies, that is quite sufficient to make of it a relevant and appropriate portion of our train of ideas.

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For the important thing about a train of thought is its conclusion. That is the *meaning*, or, as we say, the topic of the thought. That is what abides when all its other members have faded from memory. Usually this conclusion is a word or phrase or particular image, or practical attitude or resolve, whether rising to answer a problem or fill a pre-existing gap that worried us, or whether accidentally stumbled on in reverie. In either case it stands out from the other segments of the stream by reason of the peculiar interest attaching to it. This interest *arrests* it, makes a sort of crisis of it when it comes, induces attention upon it and makes us treat it in a substantive way.

The parts of the stream that precede these substantive conclusions are but the means of the latter's attainment. And, provided the same conclusion be reached, the means may be as mutable as we like, for the 'meaning' of the stream of thought will be the same. What difference does it make what the means are? "*Qu'importe le flacon, pourvu qu'on ait l'ivresse?*" The relative unimportance of the means appears from the fact that when the conclusion is there, we have always forgotten most of the steps preceding its attainment. When we have uttered a proposition, we are rarely able a moment afterwards to recall our exact words, though we can express it in different words easily enough. The practical upshot of a book we read remains with us, though we may not recall one of its sentences.

The only paradox would seem to lie in supposing that the fringe of felt affinity and discord can be the same in two heterogeneous sets of images. Take a train of words passing through the mind and leading to a certain conclusion on the one hand, and on the other hand an almost wordless set of tactile, visual and other fancies leading to the same conclusion. Can the halo, fringe, or scheme in which we feel the words to lie be the same as that in which we feel the images to lie? Does not the discrepancy of terms involve a discrepancy of felt relations among them?

If the terms be taken *quâ* mere sensations, it assuredly does. For instance, the words may rhyme with each other,—the visual images can have no such affinity as *that*. But *quâ* thoughts, *quâ* sensations *understood*, the words have contracted by long association fringes of mutual repugnance or affinity with each other and with the conclusion, which run exactly parallel with like fringes in the visual, tactile and other ideas. The most important element of these fringes is, I repeat, the mere feeling of harmony or discord, of a right or wrong

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direction in the thought. Dr. Campbell has, so far as I know, made the best analysis of this fact, and his words, often quoted, deserve to be quoted again. The chapter is entitled "What is the cause that nonsense so often escapes being detected, both by the writer and by the reader?" The author, in answering this question, makes (*inter alia*) the following remarks: [235]

"That connection [he says] or relation which comes gradually to subsist among the different words of a language, in the minds of those who speak it,... is merely consequent on this, that those words are employed as signs of connected or related things. It is an axiom in geometry that things equal to the same thing are equal to one another. It may, in like manner, be admitted as an axiom in psychology that ideas associated by the same idea will associate one another. Hence it will happen that if, from experiencing the connection of two things, there results, as infallibly there will result, an association between the ideas or notions annexed to them, as each idea will moreover be associated by its sign, there will likewise be an association between the ideas of the signs. Hence the sounds considered as signs will be conceived to have a connection analogous to that which subsisteth among the things signified; I say, the sounds considered as signs; for this way of considering them constantly attends us in speaking, writing, hearing, and reading. When we purposely abstract from it, and regard them merely as sounds, we are instantly sensible that they are quite unconnected, and have no other relation than what ariseth from similitude of tone or accent. But to consider them in this manner commonly results from previous design, and requires a kind of effort which is not exerted in the ordinary use of speech. In ordinary use they are regarded solely as signs, or, rather, they are confounded with the things they signify; the consequence of which is that, in the manner just now explained, we come insensibly to conceive a connection among them of a very different sort from that of which sounds are naturally susceptible.

"Now this conception, habit, or tendency of the mind, call it which you please, is considerably strengthened by the frequent use of language and by the structure of it. Language is the sole channel through which we communicate our knowledge and discoveries to others, and through which the knowledge and discoveries of others are communicated to us. By reiterated recourse to this medium, it necessarily happens that when things are related to each other, the words signifying those things are more commonly brought together in discourse. Hence the words and names by themselves, by customary vicinity, contract in the fancy a relation additional to that which they derive purely from being the symbols of related things. Farther, this tendency is strengthened by the structure of language. All languages whatever, even the most barbarous, as far as hath yet appeared, are of a regular and analogical make. The consequence is that similar relations in things will be expressed similarly; that is, by similar inflections, derivations, compositions, arrangement of words, or juxtaposition of particles, according to the genius or grammatical form of the particular tongue. Now as, by the habitual use of a language (even though it were quite irregular), the signs would insensibly become connected in the imagination wherever the things signified are connected in nature, so, by the regular structure of a language, this connection among the signs is conceived as analogous to that which subsisteth among their archetypes."

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If we know English and French and begin a sentence in French, all the later words that come are French; we hardly ever drop into English. And this affinity of the French words for each other is not something merely operating mechanically as a brain-law, it is something we feel at the time. Our understanding of a French sentence heard never falls to so low an ebb that

we are not aware that the words linguistically belong together. Our attention can hardly so wander that if an English word be suddenly introduced we shall not start at the change. Such a vague sense as this of the words belonging together is the very minimum of fringe that can accompany them, if 'thought' at all. Usually the vague perception that all the words we hear belong to the same language and to the same special vocabulary in that language, and that the grammatical sequence is familiar, is practically equivalent to an admission that what we hear is sense. But if an unusual foreign word be introduced, if the grammar trip, or if a term from an incongruous vocabulary suddenly appear, such as 'rat-trap' or 'plumber's bill' in a philosophical discourse, the sentence detonates, as it were, we receive a shock from the incongruity, and the drowsy assent is gone. The feeling of rationality in these cases seems rather a negative than a positive thing, being the mere absence of shock, or sense of discord, between the terms of thought.

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So delicate and incessant is this recognition by the mind of the mere fitness of words to be mentioned together that the slightest misreading, such as 'casualty' for 'causality,' or 'perpetual' for 'perceptual,' will be corrected by a listener whose attention is so relaxed that he gets no idea of the *meaning* of the sentence at all.

Conversely, if words do belong to the same vocabulary, and if the grammatical structure is correct, sentences with absolutely no meaning may be uttered in good faith and pass unchallenged. Discourses at prayer-meetings, reshuffling the same collection of cant phrases, and the whole genus of penny-a-line-isms and newspaper-reporter's flourishes give illustrations of this. "The birds filled the tree-tops with their morning song, making the air moist, cool, and pleasant," is a sentence I remember reading once in a report of some athletic exercises in Jerome Park. It was probably written unconsciously by the hurried reporter, and read uncritically by many readers. An entire volume of 784 pages lately published in Boston^[236] is composed of stuff like this passage picked out at random:

"The flow of the efferent fluids of all these vessels from their outlets at the terminal loop of each culminate link on the surface of the nuclear organism is continuous as their respective atmospheric fruitage up to the altitudinal limit of their expansibility, whence, when atmosphered by like but coalescing essences from higher altitudes,—those sensibly expressed as the essential qualities of external forms,—they descend, and become assimilated by the afferents of the nuclear organism."^[237]

There are every year works published whose contents show them to be by real lunatics. To the reader, the book quoted from seems pure nonsense from beginning to end. It is impossible to divine, in such a case, just what sort of feeling of rational relation between the words may have appeared to the author's mind. The border line between objective sense and nonsense is hard to draw; that between subjective sense and nonsense, impossible. Subjectively, any collocation of words may make sense—even the wildest words in a dream—if one only does not doubt their belonging together. Take the obscurer passages in Hegel: it is a fair question whether the rationality included in them be anything more than the fact that the words all belong to a common vocabulary, and are strung together on a scheme of predication and relation,—immediacy, self-relation, and what not,—which has habitually recurred. Yet there seems no reason to doubt that the subjective feeling of the rationality of these sentences was strong in the writer as he penned them, or even that some readers by straining may have reproduced it in themselves.

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To sum up, certain kinds of verbal associate, certain grammatical expectations fulfilled, stand for a good part of our impression that a sentence has a meaning and is dominated by

the Unity of one Thought. Nonsense in grammatical form sounds half rational; sense with grammatical sequence upset sounds nonsensical; e.g., "Elba the Napoleon English faith had banished broken to be Saint because Helena at." Finally, there is about each word the psychic 'overtone' of feeling that it brings us nearer to a forefelt conclusion. Suffuse all the words of a sentence, as they pass, with these three fringes or haloes of relation, let the conclusion seem worth arriving at, and all will admit the sentence to be an expression of thoroughly continuous, unified, and rational thought.^[238]

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Each word, in such a sentence, is felt, not only as a word, but as having a *meaning*. The 'meaning' of a word taken thus dynamically in a sentence may be quite different from its meaning when taken statically or without context. The dynamic meaning is usually reduced to the bare fringe we have described, of felt suitability or unfitness to the context and conclusion. The static meaning, when the word is concrete, as 'table,' 'Boston,' consists of sensory images awakened; when it is abstract, as 'criminal legislation,' 'fallacy,' the meaning consists of other words aroused, forming the so-called 'definition.'

Hegel's celebrated dictum that pure being is identical with pure nothing results from his taking the words statically, or without the fringe they wear in a context. Taken in isolation, they agree in the single point of awakening no sensorial images. But taken dynamically, or as significant,—as *thought*,—their fringes of relation, their affinities and repugnances, their function and meaning, are felt and understood to be absolutely opposed.

Such considerations as these remove all appearance of paradox from those cases of extremely deficient visual imagery of whose existence Mr. Galton has made us aware (see below). An exceptionally intelligent friend informs me that he can frame no image whatever of the appearance of his breakfast-table. When asked how he then remembers it at all, he says he simple '*knows*' that it seated four people, and was covered with a white cloth on which were a butter-dish, a coffee-pot, radishes, and so forth. The mind-stuff of which this 'knowing' is made seems to be verbal images exclusively. But if the words 'coffee,' 'bacon,' 'muffins,' and 'eggs' lead a man to speak to his cook, to pay his bills, and to take measures for the morrow's meal exactly as visual and gustatory memories would, why are they not, for all practical intents and purposes, as good a kind of material in which to think? In fact, we may suspect them to be for most purposes better than terms with a richer imaginative coloring. The scheme of relationship and the conclusion being the essential things in thinking, that kind of mind-stuff which is handiest will be the best for the purpose. Now words, uttered or unexpressed, are the handiest mental elements we have. Not only are they very *rapidly* revivable, but they are revivable as actual sensations more easily than any other items of our experience. Did they not possess some such advantage as this, it would hardly be the case that the older men are and the more effective as thinkers, the more, as a rule, they have lost their visualizing power and depend on words. This was ascertained by Mr. Galton to be the case with members of the Royal Society. The present writer observes it in his own person most distinctly.

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On the other hand, a deaf and dumb man can weave his tactile and visual images into a system of thought quite as effective and rational as that of a word-user. *The question whether thought is possible without language* has been a favorite topic of discussion among philosophers. Some interesting reminiscences of his childhood by Mr. Ballard, a deaf-mute instructor in the National College at Washington, show it to be perfectly possible. A few paragraphs may be quoted here.

"In consequence of the loss of my hearing in infancy, I was debarred from enjoying the advantages which children in the full possession of their senses derive from the exercises of the common primary school, from the every-day talk of their school-fellows and playmates, and from the conversation of their parents and other grown-up persons.

"I could convey my thoughts and feelings to my parents and brothers by natural signs or pantomime, and I could understand what they said to me by the same medium; our intercourse being, however, confined to the daily routine of home affairs and hardly going beyond the circle of my own observation....

"My father adopted a course which he thought would, in some measure, compensate me for the loss of my hearing. It was that of taking me with him when business required him to ride abroad; and he took me more frequently than he did my brothers; giving, as the reason for his apparent partiality, that they could acquire information through the ear, while I depended solely upon my eye for acquaintance with affairs of the outside world....

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"I have a vivid recollection of the delight I felt in watching the different scenes we passed through, observing the various phases of nature, both animate and inanimate; though we did not, owing to my infirmity, engage in conversation. It was during those delightful rides, some two or three years before my initiation into the rudiments of written language, that I began to ask myself the question: *How came the world into being?* When this question occurred to my mind, I set myself to thinking it over a long time. My curiosity was awakened as to what was the origin of human life in its first appearance upon the earth, and of vegetable life as well, and also the cause of the existence of the earth, sun, moon, and stars.

"I remember at one time when my eye fell upon a very large old stump which we happened to pass in one of our rides, I asked myself, 'Is it possible that the first man that ever came into the world rose out of that stump? But that stump is only a remnant of a once noble magnificent tree, and how came that tree? Why, it came only by beginning to grow out of the ground just like those little trees now coming up.' And I dismissed from my mind, as an absurd idea, the connection between the origin of man and a decaying old stump....

"I have no recollection of what it was that first suggested to me the question as to the origin of things. I had before this time gained ideas of the descent from parent to child, of the propagation of animals, and of the production of plants from seeds. The question that occurred to my mind was: whence came the first man, the first animal, and the first plant, at the remotest distance of time, before which there was no man, no animal, no plant; since I knew they all had a beginning and an end.

"It is impossible to state the exact order in which these different questions arose, i.e., about men, animals, plants, the earth, sun, moon, etc. The lower animals did not receive so much thought as was bestowed upon man and the earth; perhaps because I put man and beast in the same class, since I believed that man would be annihilated and there was no resurrection beyond the grave, —though I am told by my mother that, in answer to my question, in the case of a deceased uncle who looked to me like a person in sleep, she had tried to make me understand that he would awake in the far future. It was my belief that man and beast derived their being from the same source, and were to be laid down in the dust in a state of annihilation. Considering the brute animal as of secondary importance, and allied to man on a lower level, man and the earth were the two things on which my mind dwelled most.

"I think I was five years old, when I began to understand the descent from parent to child and the propagation of animals. I was nearly eleven years old, when I entered the Institution where I was educated; and I remember distinctly that it was at least two years before this time that I began to ask myself the

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question as to the origin of the universe. My age was then about eight, not over nine years.

"Of the form of the earth, I had no idea in my childhood, except that, from a look at a map of the hemispheres, I inferred there were two immense disks of matter lying near each other. I also believed the sun and moon to be round, flat plates of illuminating matter; and for those luminaries I entertained a sort of reverence on account of their power of lighting and heating the earth. I thought from their coming up and going down, travelling across the sky in so regular a manner that there must be a certain something having power to govern their course. I believed the sun went into a hole at the west and came out of another at the east, travelling through a great tube in the earth, describing the same curve as it seemed to describe in the sky. The stars seemed to me to be tiny lights studded in the sky.

"The source from which the universe came was the question about which my mind revolved in a vain struggle to grasp it, or rather to fight the way up to attain to a satisfactory answer. When I had occupied myself with this subject a considerable time, I perceived that it was a matter much greater than my mind could comprehend; and I remember well that I became so appalled at its mystery and so bewildered at my inability to grapple with it that I laid the subject aside and out of my mind, glad to escape being, as it were, drawn into a vortex of inextricable confusion. Though I felt relieved at this escape, yet I could not resist the desire to know the truth; and I returned to the subject; but as before, I left it, after thinking it over for some time. In this state of perplexity, I hoped all the time to get at the truth, still believing that the more I gave thought to the subject, the more my mind would penetrate the mystery. Thus I was tossed like a shuttlecock, returning to the subject and recoiling from it, till I came to school.

"I remember that my mother once told me about a being up above, pointing her finger towards the sky and with a solemn look on her countenance. I do not recall the circumstance which led to this communication. When she mentioned the mysterious being up in the sky, I was eager to take hold of the subject, and plied her with questions concerning the form and appearance of this unknown being, asking if it was the sun, moon, or one of the stars. I knew she meant that there was a living one somewhere up in the sky; but when I realized that she could not answer my questions, I gave it up in despair, feeling sorrowful that I could not obtain a definite idea of the mysterious living one up in the sky.

"One day, while we were haying in a field, there was a series of heavy thunder-claps. I asked one of my brothers where they came from. He pointed to the sky and made a zigzag motion with his finger, signifying lightning. I imagined there was a great man somewhere in the blue vault, who made a loud noise with his voice out of it; and each time I heard^[239] a thunder-clap I was frightened, and looked up at the sky, fearing he was speaking a threatening word."^[240]

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Here we may pause. The reader sees by this time that it makes little or no difference in what sort of mind-stuff, in what quality of imagery, his thinking goes on. The only images *intrinsically* important are the halting-places, the substantive conclusions, provisional or final, of the thought. Throughout all the rest of the stream, the feelings of relation are everything, and the terms related almost naught. These feelings of relation, these psychic overtones, halos, suffusions, or fringes about the terms, may be the same in very different systems of imagery. A diagram may

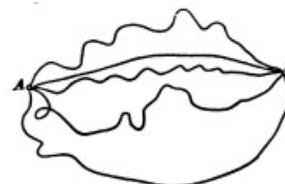


FIG. 28.

help to accentuate this indifference of the mental means where the end is the same. Let *A* be some experience from which a number of thinkers start. Let *Z* be the practical conclusion rationally inferrible from it. One gets to the conclusion by one line, another by another; one follows a course of English, another of German, verbal imagery. With one, visual images predominate; with another, tactile. Some trains are tinged with emotions, others not; some are very abridged, synthetic and rapid, others, hesitating and broken into many steps. But when the penultimate terms of all the trains, however differing *inter se*, finally shoot into the same conclusion, we say and rightly say, that all the thinkers have had substantially the same thought. It would probably astound each of them beyond measure to be let into his neighbor's mind and to find how different the scenery there was from that in his own.

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Thought is in fact a kind of Algebra, as Berkeley long ago said, "in which, though a particular quantity be marked by each letter, yet to proceed right, it is not requisite that in every step each letter suggest to your thoughts that particular quantity it was appointed to stand for." Mr. Lewes has developed this algebra-analogy so well that I must quote his words:

"The leading characteristic of algebra is that of operation on relations. This also is the leading characteristic of Thought. Algebra cannot exist without values, nor Thought without Feelings. The operations are so many blank forms till the values are assigned. Words are vacant sounds, ideas are blank forms, unless they symbolize images and sensations which are their values. Nevertheless it is rigorously true, and of the greatest importance, that analysts carry on very extensive operations with blank forms, never pausing to supply the symbols with values until the calculation is completed; and ordinary men, no less than philosophers, carry on long trains of thought without pausing to translate their ideas (words) into images.... Suppose some one from a distance shouts 'a lion!' At once the man starts in alarm.... To the man the word is not only an ... expression of all that he has seen and heard of lions, capable of recalling various experiences, but is also capable of taking its place in a connected series of thoughts without recalling any of those experiences, without reviving an image, however faint, of the lion—simply as a sign of a certain relation included in the complex so named. Like an algebraic symbol it may be operated on without conveying other significance than an abstract relation: it is a sign of Danger, related to fear with all its motor sequences. Its logical position suffices.... Ideas are *substitutions* which require a secondary process when what is symbolized by them is translated into the images and experiences it replaces; and this secondary process is frequently not performed at all, generally only performed to a very small extent. Let anyone closely examine what has passed in his mind when he has constructed a chain of reasoning, and he will be surprised at the fewness and faintness of the images which have accompanied the ideas. Suppose you inform me that 'the blood rushed violently from the man's heart, quickening his pulse at the sight of his enemy.' Of the many latent images in this phrase, how many were salient in your mind and in mine? Probably two—the man and his enemy—and these images were faint. Images of blood, heart, violent rushing, pulse, quickening, and sight, were either not revived at all, or were passing shadows. Had any such images arisen, they would have hampered thought, retarding the logical process of judgment by irrelevant connections. The symbols had substituted *relations* for these *values*.... There are no images of two things and three things, when I say 'two and three equal five;' there are simply familiar symbols having precise relations.... The verbal symbol 'horse,' which stands for all our experiences of horses, serves all the purposes of Thought, without recalling one of the images clustered in the perception of horses, just as the sight of a horse's form serves all the purposes

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of *recognition* without recalling the sound of its neighing or its tramp, its qualities as an animal of draught, and so forth."^[241]

It need only be added that as the Algebraist, though the sequence of his terms is fixed by their relations rather than by their several values, must give a real value to the *final* one he reaches; so the thinker in words must let his concluding word or phrase be translated into its full sensible-image-value, under penalty of the thought being left unrealized and pale.

This is all I have to say about the sensible continuity and unity of our thought as contrasted with the apparent discreteness of the words, images, and other means by which it seems to be carried on. Between all their substantive elements there is 'transitive' consciousness, and the words and images are 'fringed,' and not as discrete as to a careless view they seem. Let us advance now to the next head in our description of Thought's stream.

4. *Human thought appears to deal with objects independent of itself; that is, it is cognitive, or possesses the function of knowing.*

For Absolute Idealism, the infinite Thought and its objects are one. The Objects are, through being thought; the eternal Mind is, through thinking them. Were a human thought alone in the world there would be no reason for any other assumption regarding it. Whatever it might have before it would be its vision, would be there, in *its* 'there,' or then, in *its* 'then'; and the question would never arise whether an extra-mental duplicate of it existed or not. The reason why we all believe that the objects of our thoughts have a duplicate existence outside, is that there are *many* human thoughts, each with the *same* objects, as we cannot help supposing. The judgment that *my* thought has the same object as *his* thought is what makes the psychologist call my thought cognitive of an outer reality. The judgment that my own past thought and my own present thought are of the same object is what makes *me* take the object out of either and project it by a sort of triangulation into an independent position, from which it may *appear* to both. *Sameness* in a multiplicity of objective appearances is thus the basis of our belief in realities outside of thought.^[242] In [Chapter XII](#) we shall have to take up the judgment of sameness again.

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To show that the question of reality being extra-mental or not is not likely to arise in the absence of repeated experiences of the *same*, take the example of an altogether unprecedented experience, such as a new taste in the throat. Is it a subjective quality of feeling, or an objective quality felt? You do not even ask the question at this point. It is simply *that taste*. But if a doctor hears you describe it, and says: "Ha! Now you know what *heartburn* is," then it becomes a quality already existent *extra mentem tuam*, which you in turn have come upon and learned. The first spaces, times, things, qualities, experienced by the child probably appear, like the first heartburn, in this absolute way, as simple *beings*, neither in nor out of thought. But later, by having other thoughts than this present one, and making repeated judgments of sameness among their objects, he corroborates in himself the notion of realities, past and distant as well as present, which realities no one single thought either possesses or engenders, but which all may contemplate and know. This, as was stated in the last chapter, is the *psychological* point of view, the relatively uncritical non-idealistic point of view of all natural science, beyond which this book cannot go. A mind which has become conscious of its own cognitive function, plays what we have called 'the psychologist' upon itself. It not only knows the things that appear before it; it knows that it knows them. This stage of reflective condition is, more or less explicitly, our habitual adult state of mind.

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It cannot, however, be regarded as primitive. The consciousness of objects must come first. We seem to lapse into this primordial condition when consciousness is reduced to a minimum by the inhalation of anæsthetics or during a faint. Many persons testify that at a

certain stage of the anæsthetic process objects are still cognized whilst the thought of self is lost. Professor Herzen says:^[243]

"During the syncope there is absolute psychic annihilation, the absence of all consciousness; then at the beginning of coming to, one has at a certain moment a vague, limitless, infinite feeling—a sense of *existence in general* without the least trace of distinction between the me and the not-me."

Dr. Shoemaker of Philadelphia describes during the deepest conscious stage of ether-intoxication a vision of

"two endless parallel lines in swift longitudinal motion ... on a uniform misty background ... together with a constant sound or whirr, not loud but distinct ... which seemed to be connected with the parallel lines.... These phenomena occupied the whole field. There were present no dreams or visions in any way connected with human affairs, no ideas or impressions akin to anything in past experience, no emotions, of course no idea of personality. There was no conception as to what being it was that was regarding the two lines, or that there existed any such thing as such a being; the lines and waves were all."^[244]

Similarly a friend of Mr. Herbert Spencer, quoted by him in 'Mind' (vol iii, p. 556), speaks of "an undisturbed empty quiet everywhere except that a stupid presence lay like a heavy intrusion *somewhere*—a blotch on the calm." This sense of objectivity and lapse of subjectivity, even when the object is almost indefinable, is, it seems to me, a somewhat familiar phase in chloroformization, though in my own case it is too deep a phase for any articulate after-memory to remain. I only know that as it vanishes I seem to wake to a sense of my own existence as something additional to what had previously been there.^[245]

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Many philosophers, however, hold that the reflective consciousness of the self is essential to the cognitive function of thought. They hold that a thought, in order to know a thing at all, must expressly distinguish between the thing and its own self.^[246] This is a perfectly wanton assumption, and not the faintest shadow of reason exists for supposing it true. As well might I contend that I cannot dream without dreaming that I dream, swear without swearing that I swear, deny without denying that I deny, as maintain that I cannot know without knowing that I know. I may have either acquaintance-with, or knowledge-about, an object O without think about myself at all. It suffices for this that I think O, and that it exist. If, in addition to thinking O, I also think that I exist and that I know O, well and good; I then know one more thing, a fact about O, of which I previously was unmindful. That, however, does not prevent me from having already known O a good deal. *O per se*, or *O plus P*, are as good objects of knowledge as *O plus me* is. The philosophers in question simply substitute one particular object for all others, and call it *the object par excellence*. It is a case of the 'psychologist's fallacy' (see [p. 197](#)). They know the object to be one thing and the thought another; and they forthwith foist their own knowledge into that of the thought of which they pretend to give a true account. To conclude, then, *thought may, but need not, in knowing, discriminate between its object and itself*.

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We have been using the word Object. *Something must now be said about the proper use of the term Object in Psychology.*

In popular parlance the word object is commonly taken without reference to the act of knowledge, and treated as synonymous with individual subject of existence. Thus if anyone ask what is the mind's object when you say 'Columbus discovered America in 1492,' most people will reply 'Columbus,' or 'America,' or, at most, 'the discovery of America.' They will name a substantive kernel or nucleus of the consciousness, and say the thought is 'about' that,—as indeed it is,—and they will call that your thought's 'object.' Really that is usually

only the grammatical object, or more likely the grammatical subject, of your sentence. It is at most your 'fractional object;' or you may call it the 'topic' of your thought, or the 'subject of your discourse.' But the *Object* of your thought is really its entire content or deliverance, neither more nor less. It is a vicious use of speech to take out a substantive kernel from its content and call that its object; and it is an equally vicious use of speech to add a substantive kernel not articulately included in its content, and to call that its object. Yet either one of these two sins we commit, whenever we content ourselves with saying that a given thought is simply 'about' a certain topic, or that that topic is its 'object.' The object of my thought in the previous sentence, for example, is strictly speaking neither Columbus, nor America, nor its discovery. It is nothing short of the entire sentence, 'Columbus-discovered-America-in-1492.' And if we wish to speak of it substantively, we must make a substantive of it by writing it out thus with hyphens between all its words. Nothing but this can possibly name its delicate idiosyncrasy. And if we wish to *feel* that idiosyncrasy we must reproduce the thought as it was uttered, with every word fringed and the whole sentence bathed in that original halo of obscure relations, which, like an horizon, then spread about its meaning. [Pg 276]

Our psychological duty is to cling as closely as possible to the actual constitution of the thought we are studying. We may err as much by excess as by defect. If the kernel or 'topic,' Columbus, is in one way less than the thought's object, so in another way it may be more. That is, when named by the psychologist, it may mean much more than actually is present to the thought of which he is reporter. Thus, for example, suppose you should go on to think: 'He was a daring genius!' An ordinary psychologist would not hesitate to say that the object of your thought was still 'Columbus.' True, your thought is *about* Columbus. It 'terminates' in Columbus, leads from and to the direct idea of Columbus. But for the moment it is not fully and immediately Columbus, it is only 'he,' or rather 'he-was-a-daring-genius;' which, though it may be an unimportant difference for conversational purposes, is, for introspective psychology, as great a difference as there can be.

The object of every thought, then, is neither more nor less than all that the thought thinks, exactly as the thought thinks it, however complicated the matter, and however symbolic the manner of the thinking may be. It is needless to say that memory can seldom accurately reproduce such an object, when once it has passed from before the mind. It either makes too little or too much of it. Its best plan is to repeat the verbal sentence, if there was one, in which the object was expressed. But for inarticulate thoughts there is not even this resource, and introspection must confess that the task exceeds her powers. The mass of our thinking vanishes for ever, beyond hope of recovery, and psychology only gathers up a few of the crumbs that fall from the feast.

The next point to make clear is that, *however complex the object may be, the thought of it is one undivided state of consciousness.* As Thomas Brown says:^[247]

"I have already spoken too often to require again to caution you against the mistake into which, I confess, that the terms which the poverty of our language obliges us to use might of themselves very naturally lead you; the mistake of supposing that the most complex states of mind are not truly, in their very essence, as much one and indivisible as those which we term simple—the complexity and seeming coexistence which they involve being relative to our feeling^[248] only, not to their own absolute nature. I trust I need not repeat to you that, in itself, every notion, however seemingly complex, is, and must be, truly simple—being one state or affection, of one simple substance, mind. Our conception of a whole army, for example, is as truly this one mind existing in this one state, as our conception of any of the individuals that compose an army.

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Our notion of the abstract numbers, eight, four, two, is as truly one feeling of the mind as our notion of simple unity."

The ordinary associationist-psychology supposes, in contrast with this, that whenever an object of thought contains many elements, the thought itself must be made up of just as many ideas, one idea for each element, and all fused together in appearance, but really separate.^[249] The enemies of this psychology find (as we have already seen) little trouble in showing that such a bundle of separate ideas would never form one thought at all, and they contend that an Ego must be added to the bundle to give it unity, and bring the various ideas into relation with each other.^[250] We will not discuss the ego just yet, but it is obvious that if things are to be thought in relation, they must be thought together, and in one *something*, be that something ego, psychosis, state of consciousness, or whatever you please. If not thought with each other, things are not thought in relation at all. Now most believers in the ego make the same mistake as the associationists and sensationists whom they oppose. Both agree that the elements of the subjective stream are discrete and separate and constitute what Kant calls a 'manifold.' But while the associationists think that a 'manifold' can form a single knowledge, the egoists deny this, and say that the knowledge comes only when the manifold is subjected to the synthetizing activity of an ego. Both make an identical initial hypothesis; but the egoist, finding it won't express the facts, adds another hypothesis to correct it. Now I do not wish just yet to 'commit myself' about the existence or non-existence of the ego, but I do contend that we need not invoke it for this particular reason—namely, because the manifold of ideas has to be reduced to unity. *There is no manifold of coexisting ideas; the notion of such a thing is a chimera. Whatever things are thought in relation are thought from the outset in a unity, in a single pulse of subjectivity, a single psychosis, feeling, or state of mind.*

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The reason why this fact is so strangely garbled in the books seems to be what on an earlier page (see [p. 196](#) ff.) I called the psychologist's fallacy. We have the inveterate habit, whenever we try introspectively to describe one of our thoughts, of dropping the thought as it is in itself and talking of something else. We describe the things that appear to the thought, and we describe other thoughts *about* those things—as if these and the original thought were the same. If, for example, the thought be 'the pack of cards is on the table,' we say, "Well, isn't it a thought of the pack of cards? Isn't it of the cards as included in the pack? Isn't it of the table? And of the legs of the table as well? The table has legs—how can you think the table without virtually thinking its legs? Hasn't our thought then, all these parts—one part for the pack and another for the table? And within the pack-part a part for each card, as within the table-part a part for each leg? And isn't each of these parts an idea? And can our thought, then, be anything but an assemblage or pack of ideas, each answering to some element of what it knows?"

Now not one of these assumptions is true. The thought taken as an example is, in the first place, not of 'a pack of cards.' It is of 'the-pack-of-cards-is-on-the-table,' an entirely different subjective phenomenon, whose Object implies the pack, and every one of the cards in it, but whose conscious constitution bears very little resemblance to that of the thought of the pack *per se*. What a thought *is*, and what it may be developed into, or explained to stand for, and be equivalent to, are two things, not one.^[251]

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An analysis of what passes through the mind as we utter the phrase *the pack of cards is on the table* will, I hope, make this clear, and may at the same time condense into a concrete example a good deal of what has gone before.

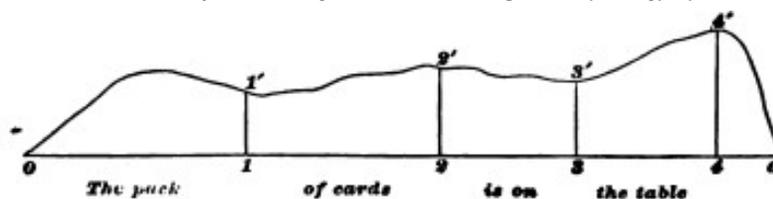


FIG. 29.—The Stream of Consciousness.

It takes time to utter the phrase. Let the horizontal line in Fig. 29 represent time. Every part of it will then stand for a fraction, every point for an instant, of the time. Of course the thought has *time-parts*. The part 2-3 of it, though continuous with 1-2, is yet a different part from 1-2. Now I say of these time-parts that we cannot take any one of them so short that it will not after some fashion or other be a thought of the whole object 'the pack of cards is on the table.' They melt into each other like dissolving views, and no two of them feel the object just alike, but each feels the total object in a unitary undivided way. This is what I mean by denying that in the thought any parts can be found corresponding to the object's parts. Time-parts are not such parts.

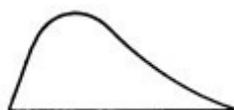
Now let the vertical dimensions of the figure stand for the objects or contents of the thoughts. A line vertical to any point of the horizontal, as $1-1'$, will then symbolize the object in the mind at the instant 1; a space above the horizontal, as $1-1'-2'-2$, will symbolize all that passes through the mind during the time 1-2 whose line it covers. The entire diagram from 0 to 0' represents a finite length of thought's stream. [Pg 280]

Can we now define the psychic constitution of each vertical section of this segment? We can, though in a very rough way. Immediately after 0, even before we have opened our mouths to speak, the entire thought is present to our mind in the form of an intention to utter that sentence. This intention, though it has no simple name, and though it is a transitive state immediately displaced by the first word, is yet a perfectly determinate phase of thought, unlike anything else (see p. 253). Again, immediately before 0', after the last word of the sentence is spoken, all will admit that we again think its entire content as we inwardly realize its completed deliverance. All vertical sections made through any other parts of the diagram will be respectively filled with other ways of feeling the sentence's meaning. Through 2, for example, the cards will be the part of the object most emphatically present to the mind; through 4, the table. The stream is made higher in the drawing at its end than at its beginning, because the final way of feeling the content is fuller and richer than the initial way. As Joubert says, "we only know just what we meant to say, after we have said it." And as M. V. Egger remarks, "before speaking, one barely knows what one intends to say, but afterwards one is filled with admiration and surprise at having said and thought it so well."

This latter author seems to me to have kept at much closer quarters with the facts than any other analyst of consciousness.^[252] But even he does not quite hit the mark, for, as I understand him, he thinks that each word as it occupies the mind *displaces* the rest of the thought's content. He distinguishes the 'idea' (what I have called the total *object* or meaning) from the consciousness of the words, calling the former a very feeble state, and contrasting it with the liveliness of the words, even when these are only silently rehearsed. "The feeling," he says, "of the words makes ten or twenty times more noise in our consciousness than the sense of the phrase, which for consciousness is a very slight matter."^[253] And having distinguished these two things, he goes on to separate them in time, saying that the idea may either precede or follow the words, but that it is a 'pure illusion' to suppose them simultaneous.^[254] Now I believe that in all cases where the words are *understood*, the total idea may be and usually is present not only before and after the phrase has been spoken, but also whilst each separate word is uttered.^[255] It is the overtone, halo, or fringe of the word, *as spoken in that sentence*. It is never absent; no word in an understood sentence comes to consciousness as a mere noise. We feel its meaning as it passes; and although our object differs from one moment to another as to its verbal kernel or nucleus, yet it is *similar* [Pg 281]

throughout the entire segment of the stream. The same object is known everywhere, now from the point of view, if we may so call it, of this word, now from the point of view of that. And in our feeling of each word there chimes an echo or foretaste of every other. The consciousness of the 'Idea' and that of the words are thus consubstantial. They are made of the same 'mind-stuff,' and form an unbroken stream. Annihilate a mind at any instant, cut its thought through whilst yet uncompleted, and examine the object present to the cross-section thus suddenly made; you will find, not the bald word in process of utterance, but that word suffused with the whole idea. The word may be so loud, as M. Egger would say, that we cannot *tell* just how its suffusion, as such, feels, or how it differs from the suffusion of the next word. But it does differ; and we maybe sure that, could we see into the brain, we should find the same processes active through the entire sentence in different degrees, each one in turn becoming maximally excited and then yielding the momentary verbal 'kernel,' to the thought's content, at other times being only sub-excited, and then combining with the other sub-excited processes to give the overtone or fringe.^[256]

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The pack of
cards is on the
table.

FIG. 30.

We may illustrate this by a farther development of the diagram on p. 279. Let the objective content of any vertical section through the stream be represented no longer by a line, but by a plane figure, highest opposite whatever part of the object is most prominent in consciousness at the moment when the section is made. This part, in verbal thought, will usually be some word. A series of sections 1-1', taken at the moments 1, 2, 3, would then look like this: horizontal breadth stands for the entire object in each of the figures; the height of the curve above each part of that object marks the relative prominence of that part in the thought. At the moment symbolized by the first figure *pack* is the prominent part; in the third figure it is *table*, etc.

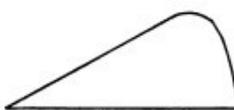


The pack of cards
is on the table.

FIG. 31.

We can easily add all these plane sections together to make a solid, one of whose solid dimensions will represent time, whilst a cut across this at right angles will give the thought's content at the moment when the cut is made. Let it be the thought, 'I am the same I that I was yesterday.' If at the fourth moment of time we annihilate the thinker and examine how the last pulsation of his consciousness was made, we find that it was an awareness of the whole content with *same* most prominent, and the other parts of the thing known relatively less distinct. With each prolongation of the scheme in the time-direction, the summit of the curve of section would come further towards the end of the sentence. If we make a solid wooden frame with the sentence written on its front, and the time-scale on one of its sides, if we spread flatly a sheet of India rubber over its top, on which rectangular co-ordinates are painted, and slide a smooth ball under the rubber in the direction

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The pack of cards
is on the table.

FIG. 32.

from 0 to 'yesterday,' the bulging of the membrane along this diagonal at successive moments will symbolize the changing of the thought's content in a way plain enough, after what has been said, to call for no more explanation. Or to express it in cerebral terms, it will show the relative intensities, at successive moments, of the several nerve-processes to which the various parts of the thought-object correspond.

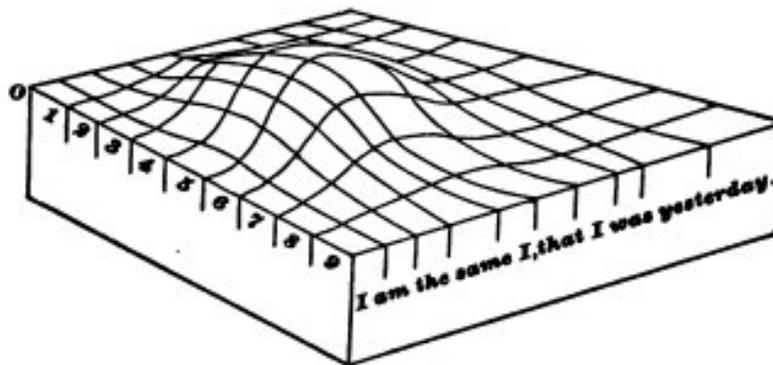


FIG. 33.

The last peculiarity of consciousness to which attention is to be drawn in this first rough description of its stream is that

5) *It is always interested more in one part of its object than in another, and welcomes and rejects, or chooses, all the while it thinks.*

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The phenomena of selective attention and of deliberative will are of course patent examples of this choosing activity. But few of us are aware how incessantly it is at work in operations not ordinarily called by these names. Accentuation and Emphasis are present in every perception we have. We find it quite impossible to disperse our attention impartially over a number of impressions. A monotonous succession of sonorous strokes is broken up into rhythms, now of one sort, now of another, by the different accent which we place on different strokes. The simplest of these rhythms is the double one, tick-tóck, tick-tóck, tick-tóck. Dots dispersed on a surface are perceived in rows and groups. Lines separate into diverse figures. The ubiquity of the distinctions, *this* and *that*, *here* and *there*, *now* and *then*, in our minds is the result of our laying the same selective emphasis on parts of place and time.

But we do far more than emphasize things, and unite some, and keep others apart. We actually *ignore* most of the things before us. Let me briefly show how this goes on.

To begin at the bottom, what are our very senses themselves but organs of selection? Out of the infinite chaos of movements, of which physics teaches us that the outer world consists, each sense-organ picks out those which fall within certain limits of velocity. To these it responds, but ignores the rest as completely as if they did not exist. It thus accentuates particular movements in a manner for which objectively there seems no valid ground; for, as Lange says, there is no reason whatever to think that the gap in Nature between the highest sound-waves and the lowest heat-waves is an abrupt break like that of our sensations; or that the difference between violet and ultra-violet rays has anything like the objective importance subjectively represented by that between light and darkness. Out of what is in itself an undistinguishable, swarming *continuum*, devoid of distinction or emphasis, our senses make for us, by attending to this motion and ignoring that, a world full of contrasts, of sharp accents, of abrupt changes, of picturesque light and shade.

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If the sensations we receive from a given organ have their causes thus picked out for us by the conformation of the organ's termination, Attention, on the other hand, out of all the sensations yielded, picks out certain ones as worthy of its notice and suppresses all the rest. Helmholtz's work on Optics is little more than a study of those visual sensations of which common men never become aware—blind spots, *musca volitantes*, after-images, irradiation,

chromatic fringes, marginal changes of color, double images, astigmatism, movements of accommodation and convergence, retinal rivalry, and more besides. We do not even know without special training on which of our eyes an image falls. So habitually ignorant are most men of this that one may be blind for years of a single eye and never know the fact.

Helmholtz says that we notice only those sensations which are signs to us of *things*. But what are things? Nothing, as we shall abundantly see, but special groups of sensible qualities, which happen practically or æsthetically to interest us, to which we therefore give substantive names, and which we exalt to this exclusive status of independence and dignity. But in itself, apart from my interest, a particular dust-wreath on a windy day is just as much of an individual thing, and just as much or as little deserves an individual name, as my own body does.

And then, among the sensations we get from each separate thing, what happens? The mind selects again. It chooses certain of the sensations to represent the thing most *truly*, and considers the rest as its appearances, modified by the conditions of the moment. Thus my table-top is named *square*, after but one of an infinite number of retinal sensations which it yields, the rest of them being sensations of two acute and two obtuse angles; but I call the latter *perspective* views, and the four right angles the *true* form of the table, and erect the attribute squareness; into the table's essence, for æsthetic reasons of my own. In like manner, the real form of the circle is deemed to be the sensation it gives when the line of vision is perpendicular to its centre—all its other sensations are signs of this sensation. The real sound of the cannon is the sensation it makes when the ear is close by. The real color of the brick is the sensation it gives when the eye looks squarely at it from a near point, out of the sunshine and yet not in the gloom; under other circumstances it gives us other color-sensations which are but signs of this—we then see it looks pinker or blacker than it really is. The reader knows no object which he does not represent to himself by preference as in some typical attitude, of some normal size, at some characteristic distance, of some standard tint, etc., etc. But all these essential characteristics, which together form for us the genuine objectivity of the thing and are contrasted with what we call the subjective sensations it may yield us at a given moment, are mere sensations like the latter. The mind chooses to suit itself, and decides what particular sensation shall be held more real and valid than all the rest.

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Thus perception involves a twofold choice. Out of all present sensations, we notice mainly such as are significant of absent ones; and out of all the absent associates which these suggest, we again pick out a very few to stand for the objective reality *par excellence*. We could have no more exquisite example of selective industry.

That industry goes on to deal with the things thus given in perception. A man's empirical thought depends on the things he has experienced, but what these shall be is to a large extent determined by his habits of attention. A thing may be present to him a thousand times, but if he persistently fails to notice it, it cannot be said to enter into his experience. We are all seeing flies, moths, and beetles by the thousand, but to whom, save an entomologist, do they say anything distinct? On the other hand, a thing met only once in a lifetime may leave an indelible experience in the memory. Let four men make a tour in Europe. One will bring home only picturesque impressions—costumes and colors, parks and views and works of architecture, pictures and statues. To another all this will be non-existent; and distances and prices, populations and drainage-arrangements, door- and window-fastenings, and other useful statistics will take their place. A third will give a rich account of the theatres, restaurants, and public balls, and naught beside; whilst the fourth will perhaps have been so wrapped in his own subjective broodings as to tell little more than a few names of places through which he passed. Each has selected, out of the same mass of presented objects, those which suited his private interest and has made his experience thereby.

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If, now, leaving the empirical combination of objects, we ask how the mind proceeds *rationally* to connect them, we find selection again to be omnipotent. In a future chapter we

shall see that all Reasoning depends on the ability of the mind to break up the totality of the phenomenon reasoned about, into parts, and to pick out from among these the particular one which, in our given emergency, may lead to the proper conclusion. Another predicament will need another conclusion, and require another element to be picked out. The man of genius is he who will always stick in his bill at the right point, and bring it out with the right element—'reason' if the emergency be theoretical, 'means' if it be practical—transfixed upon it. I here confine myself to this brief statement, but it may suffice to show that Reasoning is but another form of the selective activity of the mind.

If now we pass to its æsthetic department, our law is still more obvious. The artist notoriously selects his items, rejecting all tones, colors, shapes, which do not harmonize with each other and with the main purpose of his work. That unity, harmony, 'convergence of characters,' as M. Taine calls it, which gives to works of art their superiority over works of nature, is wholly due to *elimination*. Any natural subject will do, if the artist has wit enough to pounce upon some one feature of it as characteristic, and suppress all merely accidental items which do not harmonize with this.

Ascending still higher, we reach the plane of Ethics, where choice reigns notoriously supreme. An act has no ethical quality whatever unless it be chosen out of several all equally possible. To sustain the arguments for the good course and keep them ever before us, to stifle our longing for more flowery ways, to keep the foot unflinchingly on the arduous path, these are characteristic ethical energies. But more than these; for these but deal with the means of compassing interests already felt by the man to be supreme. The ethical energy *par excellence* has to go farther and choose which *interest* out of several, equally coercive, shall become supreme. The issue here is of the utmost pregnancy, for it decides a man's entire career. When he debates, Shall I commit this crime? choose that profession? accept that office, or marry this fortune?—his choice really lies between one of several equally possible future Characters. What he shall *become* is fixed by the conduct of this moment. Schopenhauer, who enforces his determinism by the argument that with a given fixed character only one reaction is possible under given circumstances, forgets that, in these critical ethical moments, what consciously *seems* to be in question is the complexion of the character itself. The problem with the man is less what act he shall now choose to do, than what being he shall now resolve to become.

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Looking back, then, over this review, we see that the mind is at every stage a theatre of simultaneous possibilities. Consciousness consists in the comparison of these with each other, the selection of some, and the suppression of the rest by the reinforcing and inhibiting agency of attention. The highest and most elaborated mental products are filtered from the data chosen by the faculty next beneath, out of the mass offered by the faculty below that, which mass in turn was sifted from a still larger amount of yet simpler material, and so on. The mind, in short, works on the data it receives very much as a sculptor works on his block of stone. In a sense the statue stood there from eternity. But there were a thousand different ones beside it, and the sculptor alone is to thank for having extricated this one from the rest. Just so the world of each of us, howsoever different our several views of it may be, all lay embedded in the primordial chaos of sensations, which gave the mere *matter* to the thought of all of us indifferently. We may, if we like, by our reasonings unwind things back to that black and jointless continuity of space and moving clouds of swarming atoms which science calls the only real world. But all the while the world *we* feel and live in will be that which our ancestors and we, by slowly cumulative strokes of choice, have extricated out of this, like sculptors, by simply rejecting certain portions of the given stuff. Other sculptors, other statues from the same stone! Other minds, other worlds from the same monotonous and inexpressive chaos! My world is but one in a million alike embedded, alike real to those who may abstract them. How different must be the worlds in the consciousness of ant, cuttle-fish, or crab!

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But in my mind and your mind the rejected portions and the selected portions of the original world-stuff are to a great extent the same. The human race as a whole largely agrees as to what it shall notice and name, and what not. And among the noticed parts we select in much the same way for accentuation and preference or subordination and dislike. There is, however, one entirely extraordinary case in which no two men ever are known to choose alike. One great splitting of the whole universe into two halves is made by each of us; and for each of us almost all of the interest attaches to one of the halves; but we all draw the line of division between them in a different place. When I say that we all call the two halves by the same names, and that those names are '*me*' and '*not-me*' respectively, it will at once be seen what I mean. The altogether unique kind of interest which each human mind feels in those parts of creation which it can call *me* or *mine* may be a moral riddle, but it is a fundamental psychological fact. No mind can take the same interest in his neighbor's *me* as in his own. The neighbor's *me* falls together with all the rest of things in one foreign mass, against which his own *me* stands out in startling relief. Even the trodden worm, as Lotze somewhere says, contrasts his own suffering self with the whole remaining universe, though he have no clear conception either of himself or of what the universe may be. He is for me a mere part of the world; for him it is I who am the mere part. Each of us dichotomizes the Kosmos in a different place.

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Descending now to finer work than this first general sketch, let us in the next chapter try to trace the psychology of this fact of self-consciousness to which we have thus once more been led.

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- [215] A good deal of this chapter is reprinted from an article 'On some Omissions of Introspective Psychology' which appeared in 'Mind' for January 1884.
- [216] B. P. Bowne: *Metaphysics*, p. 362.
- [217] *L'Automatisme Psychologique*, p. 318.
- [218] Cf. A. Constans: *Relation sur une Épidémie d'hystéro-démonopathie en 1861*. 2me ed. Paris, 1863.—Chiap e Franzolin: *L'Epidemia d'istero-demonopathie in Verzeichnis*. Reggio, 1879.—See also J. Kerner's little work: *Nachricht von dem Vorkommen des Besessenseins*. 1836.
- [219] For the Physiology of this compare the chapter on the Will.
- [220] *Loc. cit.*, p. 316.
- [221] *The Philosophy of Reflection*, i, 248, 290.
- [222] *Populäre Wissenschaftliche Vorträge*, Drittes Heft (1876). p. 72.
- [223] Fick, in L. Hermann's *Handb. d. Physiol.*, Bd. iii, Th. i, p. 225.
- [224] It need of course not follow, because a total brain-state does not recur, that no *point* of the brain can ever be twice in the same condition. That would be as improbable a consequence as that in the sea a wave-crest should never come twice at the same point of space. What can hardly come twice is an identical *combination* of wave-forms all with their crests and hollows reoccupying identical places. For such a total combination as this is the analogue of the brain-state to which our actual consciousness at any moment is due.
- [225] The accurate registration of the 'how long' is still a little mysterious.
- [226] Cf. Brentano; *Psychologie*, vol. i, pp. 219-20. Altogether this chapter of Brentano's on the Unity of Consciousness is as good as anything with which I am acquainted.

[227] Honor to whom honor is due! The most explicit acknowledgment I have anywhere found of all this is in a buried and forgotten paper by the Rev. Jas. Wills, on 'Accidental Association,' in the Transactions of the Royal Irish Academy, vol xxi, part i (1846). Mr. Wills writes:

"At every instant of conscious thought there is a certain sum of perceptions, or reflections, or both together, present, and together constituting one whole state of apprehension. Of this some definite portion may be far more distinct than all the rest; and the rest be in consequence proportionally vague, even to the limit of obliteration. But still, within this limit, the most dim shade of perception enters into, and in some infinitesimal degree modifies, the whole existing state. This state will thus be in some way modified by any sensation or emotion, or act of distinct attention, that may give prominence to any part of it; so that the actual result is capable of the utmost variation, according to the person or the occasion.... To any portion of the entire scope here described there may be a special direction of the attention, and this special direction is recognized as strictly what is *recognized* as the idea present to the mind. This idea is evidently not commensurate with the entire state of apprehension, and much perplexity has arisen from not observing this fact. However deeply we may suppose the attention to be engaged by any thought, any considerable alteration of the surrounding phenomena would still be perceived; the most abstruse demonstration in this room would not prevent a listener, however absorbed, from noticing the sudden extinction of the lights. Our mental states have always an *essential unity*, such that each state of apprehension, however variously compounded, is a single whole, of which every component is, therefore, strictly apprehended (so far as it is apprehended) as a part. Such is the elementary basis from which all our intellectual operations commence."

[228] Compare the charming passage in Taine on Intelligence (N. Y. ed.), i, 83-4.

[229] E.g.: "The stream of thought is not a continuous current, but a series of distinct ideas, more or less rapid in their succession; the rapidity being measurable by the number that pass through the mind in a given time." (Bain: E. and W., p. 29.)

[230] Few writers have admitted that we cognize relations through feeling. The intellectualists have explicitly denied the possibility of such a thing—e.g., Prof. T. H. Green ('Mind,' vol. vii, p. 28): "No feeling, as such or as felt, is [of?] a relation.... Even a relation between feelings is not itself a feeling or felt." On the other hand, the sensationists have either smuggled in the cognition without giving any account of it, or have denied the relations to be cognized, or even to exist, at all. A few honorable exceptions, however, deserve to be named among the sensationists. Destutt de Tracy, Laromiguière, Cardaillac, Brown, and finally Spencer, have explicitly contended for feelings of relation, consubstantial with our feelings or thoughts of the terms 'between' which they obtain. Thus Destutt de Tracy says (Éléments d'Idéologie, T. Ier, chap. iv): "The faculty of judgment is itself a sort of sensibility, for it is the faculty of feeling the relations among our ideas; and to feel relations is to feel." Laromiguière writes (Leçons de Philosophie, II^{me} Partie, 3^{me} Leçon):

"There is no one whose intelligence does not embrace simultaneously many ideas, more or less distinct, more or less confused. Now, when we have many ideas at once, a peculiar feeling arises in us: we feel, among these ideas, resemblances, differences, relations. Let us call this mode of feeling, common to us all, the feeling of relation, or relation-feeling (*sentiment-rapport*). One sees immediately that these relation-feelings, resulting from the propinquity of ideas, must be infinitely more numerous than the sensation-feelings (*sentiments-sensations*) or the feelings we have of the action of our faculties. The slightest knowledge of the mathematical theory of combinations will prove this.... *Ideas* of relation originate in feelings of relation. They are the effect of our comparing them and reasoning about them."

Similarly, de Cardaillac (*Études Élémentaires de Philosophie*, Section i, chap. vii):

"By a natural consequence, we are led to suppose that at the same time that we have several sensations or several ideas in the mind, we feel the relations which exist between these sensations, and the relations which exist between these ideas.... If the feeling of relations exists in us,... it is necessarily the most varied and the most fertile of all human feelings: 1°, the most varied, because, relations being more numerous than beings, the feelings of relation must be in the same proportion more numerous than the sensations whose presence gives rise to their formation; 2°, the most fertile, for the relative ideas of which the feeling-of-relation is the source ... are more important than absolute ideas, if such exist.... If we interrogate common speech, we find the feeling of relation expressed there in a thousand different ways. If it is easy to seize a relation, we say that it is *sensible*, to distinguish it from one which, because its terms are too remote, cannot be as quickly perceived. A sensible difference, or resemblance.... What is taste in the arts, in intellectual productions? What but the feeling of those relations among the parts which constitutes their merit?... Did we not feel relations we should never attain to true knowledge,... for almost all our knowledge is of relations.... We never have an isolated sensation;... we are therefore never without the feeling of relation.... An *object* strikes our senses; we see in it only a sensation.... The relative is so near the absolute, the relation-feeling so near the sensation-feeling, the two are so intimately fused in the composition of the object, that the relation appears to us as part of the sensation itself. It is doubtless to this sort of fusion between sensations and feelings of relation that the silence of metaphysicians as to the latter is due; and it is for the same reason that they have obstinately persisted in asking from sensation alone those ideas of relation which it was powerless to give."

Dr. Thomas Brown writes (*Lectures*, xlv, *init.*): "There is an extensive order of our feelings which involve this notion of relation, and which consist indeed in the mere perception of a relation of some sort.... Whether the relation be of two or of many external objects, or of two or many affections of the mind, the feeling of this relation ... is what I term a relative suggestion; that phrase being the simplest which it is possible to employ, for expressing, without any theory, the mere fact of the rise of certain feelings of relation, after certain other feelings which precede them; and therefore, as involving no particular theory, and simply expressive of an undoubted fact.... That the feelings of relation are states of the mind essentially different from our simple perceptions, or conceptions of the objects,... that they are not what Condillac terms *transformed sensations*, I proved in a former lecture, when I combated the excessive simplification of that ingenious but not very accurate philosopher. There is an original tendency or susceptibility of the mind, by which, on perceiving together different objects, we are instantly, without the intervention of any other mental process, sensible of their relation in certain respects, as truly as there is an original tendency or susceptibility by which, when external objects are present and have produced a certain affection of our sensorial organ, we are instantly affected with the primary elementary feelings of perception; and, I may add, that as our sensations or perceptions are of various species, so are there various species of relations;—the number of relations, indeed, even of external things, being almost infinite, while the number of perceptions is, necessarily, limited by that of the objects which have the power of producing some affection of our organs of sensation.... Without that susceptibility of the mind by which it has the feeling of relation, our consciousness would be as truly limited to a single point, as our body would become, were it possible to fetter it to a single atom."

Mr. Spencer is even more explicit. His philosophy is crude in that he seems to suppose that it is only in transitive states that outward relations are known; whereas in truth space-relations, relations of contrast, etc., are felt along with their

terms, in substantive states as well as in transitive states, as we shall abundantly see. Nevertheless Mr. Spencer's passage is so clear that it also deserves to be quoted in full (Principles of Psychology, § 65):

"The proximate components of Mind are of two broadly-contrasted kinds—Feelings and the relations between feelings. Among the members of each group there exist multitudinous unlikenesses, many of which are extremely strong; but such unlikenesses are small compared with those which distinguish members of the one group from members of the other. Let us, in the first place, consider what are the characters which all Feelings have in common, and what are the characters which all Relations between feelings have in common.

"Each feeling, as we here define it, is any portion of consciousness which occupies a place sufficiently large to give it a perceivable individuality; which has its individuality marked off from adjacent portions of consciousness by qualitative contrasts; and which, when introspectively contemplated, appears to be homogeneous. These are the essentials. Obviously if, under introspection, a state of consciousness is decomposable into unlike parts that exist either simultaneously or successively, it is not one feeling but two or more. Obviously if it is indistinguishable from an adjacent portion of consciousness, it forms one with that portion—is not an individual feeling, but part of one. And obviously if it does not occupy in consciousness an appreciable area, or an appreciable duration, it cannot be known as a feeling.

"A Relation between feelings is, on the contrary, characterized by occupying no appreciable part of consciousness. Take away the terms it unites, and it disappears along with them; having no independent place, no individuality of its own. It is true that, under an ultimate analysis, what we call a relation proves to be itself a kind of feeling—the momentary feeling accompanying the transition from one conspicuous feeling to an adjacent conspicuous feeling. And it is true that, notwithstanding its extreme brevity, its qualitative character is appreciable; for relations are (as we shall hereafter see) distinguishable from one another only by the unlikenesses of the feelings which accompany the momentary transitions. Each relational feeling may, in fact, be regarded as one of those nervous shocks which we suspect to be the units of composition of feelings; and, though instantaneous, it is known as of greater or less strength, and as taking place with greater or less facility. But the contrast between these relational feelings and what we ordinarily call feelings is so strong that we must class them apart. Their extreme brevity, their small variety, and their dependence on the terms they unite, differentiate them in an unmistakable way.

"Perhaps it will be well to recognize more fully the truth that this distinction cannot be absolute. Besides admitting that, as an element of consciousness, a relation is a momentary feeling, we must also admit that just as a relation can have no existence apart from the feelings which form its terms, so a feeling can exist only by relations to other feelings which limit it in space or time or both. Strictly speaking, neither a feeling nor a relation is an independent element of consciousness: there is throughout a dependence such that the appreciable areas of consciousness occupied by feelings can no more possess individualities apart from the relations which link them, than these relations can possess individualities apart from the feelings they link. The essential distinction between the two, then, appears to be that whereas a relational feeling is a portion of consciousness inseparable into parts, a feeling, ordinarily so called, is a portion of consciousness that admits imaginary division into like parts which are related to one another in sequence or coexistence. A feeling proper is either made up of like parts that occupy time, or it is made up of like parts that occupy space, or both. In any case, a feeling proper is an aggregate of related like parts, while a relational feeling is undecomposable. And this is exactly the contrast between the two which must

result if, as we have inferred, feelings are composed of units of feelings, or shocks."

- [231] M. Paulhan (Revue Philosophique, xx, 455-6), after speaking of the faint mental images of objects and emotions, says: "We find other vaguer states still, upon which attention seldom rests, except in persons who by nature or profession are addicted to internal observation. It is even difficult to name them precisely, for they are little known and not classed; but we may cite as an example of them that peculiar impression which we feel when, strongly preoccupied by a certain subject, we nevertheless are engaged with, and have our attention almost completely absorbed by, matters quite disconnected therewithal. We do not then exactly think of the object of our preoccupation; we do not represent it in a clear manner; and yet our mind is not as it would be without this preoccupation. Its object, absent from consciousness, is nevertheless represented there by a peculiar unmistakable impression, which often persists long and is a strong feeling, although so obscure for our intelligence." "A mental sign of the kind is the unfavorable disposition left in our mind towards an individual by painful incidents erewhile experienced and now perhaps forgotten. The sign remains, but is not understood; its definite meaning is lost." (P. 458.)
- [232] Mozart describes thus his manner of composing: First bits and crumbs of the piece come and gradually join together in his mind; then the soul getting warmed to the work, the thing grows more and more, "and I spread it out broader and clearer, and at last it gets almost finished in my head, even when it is a long piece, so that I can see the whole of it at a single glance in my mind, as if it were a beautiful painting or a handsome human being; in which way I do not hear it in my imagination at all as a succession—the way it must come later—but all at once, as it were. If is a rare feast! All the inventing and making goes on in me as in a beautiful strong dream. But the best of all is the *hearing of it all at once*."
- [233] Mental Physiology, § 236. Dr. Carpenter's explanation differs materially from that given in the text.
- [234] Cf. also S. Stricker: Vorlesungen über allg. u. exp. Pathologie (1879), pp. 462-3, 501, 547; Romanes: Origin of Human Faculty, p. 82. It is so hard to make one's self clear that I may advert to a misunderstanding of my views by the late Prof. Thos. Maguire of Dublin (Lectures on Philosophy, 1885). This author considers that by the 'fringe' I mean some sort of psychic material by which sensations in themselves separate are made to cohere together, and wittily says that I ought to "see that uniting sensations by their 'fringes' is more vague than to construct the universe out of oysters by plating their beards" (p. 211). But the fringe, as I use the word, means nothing like this; it is part of the *object cognized*,—substantive *qualities* and *things* appearing to the mind in a *fringe of relations*. Some parts—the transitive parts—of our stream of thought cognize the relations rather than the things; but both the transitive and the substantive parts form one continuous stream, with no discrete 'sensations' in it such as Prof. Maguire supposes, and suppose me to suppose, to be there.
- [235] George Campbell: Philosophy of Rhetoric, book ii, chap. vii.
- [236] Substantialism or Philosophy of Knowledge, by 'Jean Story' (1879).
- [237] M. G. Tarde, quoting (in Delbœuf, Le Sommeil et les Rêves (1885), p. 226) some nonsense-verses from a dream, says they show "how prosodic forms may subsist in a mind from which logical rules are effaced.... I was able, in dreaming, to preserve the faculty of finding two words which rhymed, to appreciate the rhyme, to fill up the verse as it first presented itself with other words which, added, gave the right number of syllables, and yet I was ignorant of the sense of the words.... Thus we have the extraordinary fact that the words called each other up, without calling up their sense.... Even when awake, it is more difficult to ascend to the meaning of a word than to pass from one word to another; or to put it otherwise, *it*

is harder to be a thinker than to be a rhetorician, and on the whole nothing is commoner than trains of words not understood."

- [238] We think it odd that young children should listen with such rapt attention to the reading of stories expressed in words half of which they do not understand, and of none of which they ask the meaning. But their thinking is in form just what ours is when it is rapid. Both of us make flying leaps over large portions of the sentences uttered and we give attention only to substantive starting points, turning points, and conclusions here and there. All the rest, 'substantive' and separately intelligible as it may *potentially* be, actually serves only as so much transitive material. It is *internodal* consciousness, giving us the sense of continuity, but having no significance apart from its mere gap-filling function. The children probably feel no gap when through a lot of unintelligible words they are swiftly carried to a familiar and intelligible terminus.
- [239] Not literally *heard*, of course. Deaf mutes are quick to perceive shocks and jars that can be felt, even when so slight as to be unnoticed by those who can hear.
- [240] Quoted by Samuel Porter: 'Is Thought possible without Language?' in Princeton Review, 57th year, pp. 108-12 (Jan. 1881?). Cf. also W. W. Ireland: The Blot upon the Brain (1886), Paper x, part ii; G. J. Romanes: Mental Evolution in Man, pp. 81-83, and references therein made. Prof. Max Müller gives a very complete history of this controversy in pp. 30-64 of his 'Science of Thought' (1887). His own view is that Thought and Speech are inseparable; but under speech he includes any conceivable sort of symbolism or even mental imagery, and he makes no allowance for the wordless summary glimpses which we have of systems of relation and direction.
- [241] Problems of Life and Mind, 3d Series, Problem iv, chapter 5. Compare also Victor Egger: La Parole Intérieure (Paris, 1881), chap. vi.
- [242] If but one person sees an apparition we consider it his private hallucination. If more than one, we begin to think it may be a real external presence.
- [243] Revue Philosophique, vol. xxi, p. 671.
- [244] Quoted from the Therapeutic Gazette, by the N. Y. Semi-weekly Evening Post for Nov. 2, 1886.
- [245] In half-stunned states self-consciousness may lapse. A friend writes me: "We were driving back from — — in a wagonette. The door flew open and X., alias 'Baldy,' fell out on the road. We pulled up at once, and then he said, 'Did anybody fall out?' or 'Who fell out?'—I don't exactly remember the words. When told that Baldy fell out, he said, 'Did Baldy fall out? Poor Baldy!'"
- [246] Kant originated this view. I subjoin a few English statements of it. J. Ferrier, Institutes of Metaphysic, Proposition i: "Along with whatever any intelligence knows it must, as the ground or condition of its knowledge, have some knowledge of itself." Sir Wm. Hamilton, Discussions, p. 47: "We know, and we know that we know,—these propositions, logically distinct, are really identical; each implies the other.... So true is the scholastic brocard: *non sentimus nisi sentiamus nos sentire*." H. L. Mansel, Metaphysics, p. 58: "Whatever variety of materials may exist within reach of my mind, I can become conscious of them only by recognizing them as mine.... Relation to the conscious self is thus the permanent and universal feature which every state of consciousness as such must exhibit." T. H. Green, Introduction to Hume, p. 12: "A consciousness by the man ... of himself, in negative relation to the thing that is his object, and this consciousness must be taken to go along with the perceptive act itself. Not less than this indeed can be involved in any act that is to be the beginning of knowledge at all. It is the minimum of possible thought or intelligence."

- [247] Lectures on the Philosophy of the Human Mind, Lecture 45.

- [248] Instead of saying *to our feeling only*, he should have said, to the *object* only.
- [249] "There can be no difficulty in admitting that association does form the ideas of an indefinite number of individuals into one complex idea; because it is an acknowledged fact. Have we not the idea of an army? And is not that precisely the ideas of an indefinite number of men formed into one idea?" (Jas. Mill's Analysis of the Human Mind (J. S. Mill's Edition), vol. i, p. 264.)
- [250] For their arguments, see above.
- [251] I know there are readers whom nothing can convince that the thought of a complex object has not as many parts as are discriminated in the object itself. Well, then, let the word parts pass. Only observe that these parts are not the separate 'ideas' of traditional psychology. No one of them can live out of that particular thought, any more than my head can live off of my particular shoulders. In a sense a soap-bubble has parts; it is a sum of juxtaposed spherical triangles. But these triangles are not separate realities; neither are the 'parts' of the thought separate realities. Touch the bubble and the triangles are no more. Dismiss the thought and out go its parts. You can no more make a new thought out of 'ideas' that have once served than you can make a new bubble out of old triangles Each bubble, each thought, is a fresh organic unity, *sui generis*.
- [252] In his work, *La Parole Intérieure* (Paris, 1881), especially chapters vi and vii.
- [253] Page 301.
- [254] Page 218. To prove this point, M. Egger appeals to the fact that we often hear some one speak whilst our mind is preoccupied, but do not understand him until some moments afterwards, when we suddenly 'realize' what he meant. Also to our digging out the meaning of a sentence in an unfamiliar tongue, where the words are present to us long before the idea is taken in. In these special cases the word does indeed precede the idea. The idea, on the contrary, precedes the word whenever we try to express ourselves with effort, as in a foreign tongue, or in an unusual field of intellectual invention. Both sets of cases, however, are exceptional, and M. Egger would probably himself admit, on reflection, that in the former class there is some sort of a verbal suffusion, however evanescent, of the idea, when it is grasped—we hear the echo of the words as we catch their meaning. And he would probably admit that in the second class of cases the idea persists after the words that came with so much effort are found. In normal cases the simultaneity, as he admits, is obviously there.
- [255] A good way to get the words and the sense separately is to inwardly articulate word for word the discourse of another. One then finds that the meaning will often come to the mind in pulses, after clauses or sentences are finished.
- [256] The nearest approach (with which I am acquainted) to the doctrine set forth here is in O. Liebmann's *Zur Analysis der Wirklichkeit*, pp. 427-438.

CHAPTER X.

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THE CONSCIOUSNESS OF SELF.

Let us begin with the Self in its widest acceptation, and follow it up to its most delicate and subtle form, advancing from the study of the empirical, as the Germans call it, to that of the pure, Ego.

THE EMPIRICAL SELF OR ME.

The Empirical Self of each of us is all that he is tempted to call by the name of *me*. But it is clear that between what a man calls *me* and what he simply calls *mine* the line is difficult to draw. We feel and act about certain things that are ours very much as we feel and act about ourselves. Our fame, our children, the work of our hands, may be as dear to us as our bodies are, and arouse the same feelings and the same acts of reprisal if attacked. And our bodies themselves, are they simply ours, or are they *us*? Certainly men have been ready to disown their very bodies and to regard them as mere vestures, or even as prisons of clay from which they should some day be glad to escape.

We see then that we are dealing with a fluctuating material. The same object being sometimes treated as a part of me, at other times as simply mine, and then again as if I had nothing to do with it at all. *In its widest possible sense, however, a man's Self is the sum total of all that he CAN call his*, not only his body and his psychic powers, but his clothes and his house, his wife and children, his ancestors and friends, his reputation and works, his lands and horses, and yacht and bank-account. All these things give him the same emotions. If they wax and prosper, he feels triumphant; if they dwindle and die away, he feels cast down,—not necessarily in the same degree for each thing, but in much the same way for all. Understanding the Self in this widest sense, we may begin by dividing the history of it into three parts, relating respectively to—

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1. Its constituents;
2. The feelings and emotions they arouse,—*Self-feelings*;
3. The actions to which they prompt,—*Self-seeking and Self-preservation*.

1. *The constituents of the Self* may be divided into two classes, those which make up respectively—

- (a) The material Self;
- (b) The social Self;
- (c) The spiritual Self; and
- (d) The pure Ego.

(a) The body is the innermost part of *the material Self* in each of us; and certain parts of the body seem more intimately ours than the rest. The clothes come next. The old saying that the human person is composed of three parts—soul, body and clothes—is more than a joke. We so appropriate our clothes and identify ourselves with them that there are few of us who, if asked to choose between having a beautiful body clad in raiment perpetually shabby and unclean, and having an ugly and blemished form always spotlessly attired, would not hesitate a moment before making a decisive reply.^[257] Next, our immediate family is a part of ourselves. Our father and mother, our wife and babes, are bone of our bone and flesh of our flesh. When they die, a part of our very selves is gone. If they do anything wrong, it is our shame. If they are insulted, our anger flashes forth as readily as if we stood in their place. Our home comes next. Its scenes are part of our life; its aspects awaken the tenderest feelings of affection; and we do not easily forgive the stranger who, in visiting it, finds fault with its arrangements or treats it with contempt. All these different things are the objects of instinctive preferences coupled with the most important practical interests of life. We all have a blind impulse to watch over our body, to deck it with clothing of an ornamental sort, to cherish parents, wife and babes, and to find for ourselves a home of our own which we may live in and 'improve.'

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An equally instinctive impulse drives us to collect property; and the collections thus made become, with different degrees of intimacy, parts of our empirical selves. The parts of our

wealth most intimately ours are those which are saturated with our labor. There are few men who would not feel personally annihilated if a life-long construction of their hands or brains —say an entomological collection or an extensive work in manuscript—were suddenly swept away. The miser feels similarly towards his gold, and although it is true that a part of our depression at the loss of possessions is due to our feeling that we must now go without certain goods that we expected the possessions to bring in their train, yet in every case there remains, over and above this, a sense of the shrinkage of our personality, a partial conversion of ourselves to nothingness, which is a psychological phenomenon by itself. We are all at once assimilated to the tramps and poor devils whom we so despise, and at the same time removed farther than ever away from the happy sons of earth who lord it over land and sea and men in the full-blown lustihood that wealth and power can give, and before whom, stiffen ourselves as we will by appealing to anti-snobbish first principles, we cannot escape an emotion, open or sneaking, of respect and dread.

(b) *A man's Social Self* is the recognition which he gets from his mates. We are not only gregarious animals, liking to be in sight of our fellows, but we have an innate propensity to get ourselves noticed, and noticed favorably, by our kind. No more fiendish punishment could be devised, were such a thing physically possible, than that one should be turned loose in society and remain absolutely unnoticed by all the members thereof. If no one turned round when we entered, answered when we spoke, or minded what we did, but if every person we met 'cut us dead,' and acted as if we were non-existing things, a kind of rage and impotent despair would ere long well up in us, from which the cruellest bodily tortures would be a relief; for these would make us feel that, however bad might be our plight, we had not sunk to such a depth as to be unworthy of attention at all.

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Properly speaking, *a man has as many social selves as there are individuals who recognize him* and carry an image of him in their mind. To wound any one of these his images is to wound him.^[258] But as the individuals who carry the images fall naturally into classes, we may practically say that he has as many different social selves as there are distinct *groups* of persons about whose opinion he cares. He generally shows a different side of himself to each of these different groups. Many a youth who is demure enough before his parents and teachers, swears and swaggers like a pirate among his 'tough' young friends. We do not show ourselves to our children as to our club-companions, to our customers as to the laborers we employ, to our own masters and employers as to our intimate friends. From this there results what practically is a division of the man into several selves; and this may be a discordant splitting, as where one is afraid to let one set of his acquaintances know him as he is elsewhere; or it may be a perfectly harmonious division of labor, as where one tender to his children is stern to the soldiers or prisoners under his command.

The most peculiar social self which one is apt to have is in the mind of the person one is in love with. The good or bad fortunes of this self cause the most intense elation and dejection —unreasonable enough as measured by every other standard than that of the organic feeling of the individual. To his own consciousness he *is* not, so long as this particular social self fails to get recognition, and when it is recognized his contentment passes all bounds.

A man's *fame*, good or bad, and his *honor* or dishonor, are names for one of his social selves. The particular social self of a man called his honor is usually the result of one of those splittings of which we have spoken. It is his image in the eyes of his own 'set,' which exalts or condemns him as he conforms or not to certain requirements that may not be made of one in another walk of life. Thus a layman may abandon a city infected with cholera; but a priest or a doctor would think such an act incompatible with his honor. A soldier's honor requires him to fight or to die under circumstances where another man can apologize or run away with no stain upon his social self. A judge, a statesman, are in like manner debarred by

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the honor of their cloth from entering into pecuniary relations perfectly honorable to persons in private life. Nothing is commoner than to hear people discriminate between their different selves of this sort: "As a man I pity you, but as an official I must show you no mercy; as a politician I regard him as an ally, but as a moralist I loathe him;" etc., etc. What may be called 'club-opinion' is one of the very strongest forces in life.^[259] The thief must not steal from other thieves; the gambler must pay his gambling-debts, though he pay no other debts in the world. The code of honor of fashionable society has throughout history been full of permissions as well as of vetoes, the only reason for following either of which is that so we best serve one of our social selves. You must not lie in general, but you may lie as much as you please if asked about your relations with a lady; you must accept a challenge from an equal, but if challenged by an inferior you may laugh him to scorn: these are examples of what is meant.

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(c) By the Spiritual Self, so far as it belongs to the Empirical Me, I mean a man's inner or subjective being, his psychic faculties or dispositions, taken concretely; not the bare principle of personal Unity, or 'pure' Ego, which remains still to be discussed. These psychic dispositions are the most enduring and intimate part of the self, that which we most verily seem to be. We take a purer self-satisfaction when we think of our ability to argue and discriminate, of our moral sensibility and conscience, of our indomitable will, than when we survey any of our other possessions. Only when these are altered is a man said to be *alienatus a se*.

Now this spiritual self may be considered in various ways. We may divide it into faculties, as just instanced, isolating them one from another, and identifying ourselves with either in turn. This is an *abstract* way of dealing with consciousness, in which, as it actually presents itself, a plurality of such faculties are always to be simultaneously found; or we may insist on a concrete view, and then the spiritual self in us will be either the entire stream of our personal consciousness, or the present 'segment' or 'section' of that stream, according as we take a broader or a narrower view—both the stream and the section being concrete existences in time, and each being a unity after its own peculiar kind. But whether we take it abstractly or concretely, our considering the spiritual self at all is a reflective process, is the result of our abandoning the outward-looking point of view, and of our having become able to think of subjectivity as such, *to think ourselves as thinkers*.

This attention to thought as such, and the identification of ourselves with it rather than with any of the objects which it reveals, is a momentous and in some respects a rather mysterious operation, of which we need here only say that as a matter of fact it exists; and that in everyone, at an early age, the distinction between thought as such, and what it is 'of' or 'about,' has become familiar to the mind. The deeper grounds for this discrimination may possibly be hard to find; but superficial grounds are plenty and near at hand. Almost anyone will tell us that thought is a different sort of existence from things, because many sorts of thought are of no things—e.g., pleasures, pains, and emotions; others are of non-existent things—errors and fictions; others again of existent things, but in a form that is symbolic and does not resemble them—abstract ideas and concepts; whilst in the thoughts that do resemble the things they are 'of' (percepts, sensations), we can feel, alongside of the thing known, the thought of it going on as an altogether separate act and operation in the mind.

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Now this subjective life of ours, distinguished as such so clearly from the objects known by its means, may, as aforesaid, be taken by us in a concrete or in an abstract way. Of the concrete way I will say nothing just now, except that the actual 'section' of the stream will ere long, in our discussion of the nature of the principle of *unity* in consciousness, play a very important part. The abstract way claims our attention first. If the stream as a whole is identified with the Self far more than any outward thing, a *certain portion of the stream*

abstracted from the rest is so identified in an altogether peculiar degree, and is felt by all men as a sort of innermost centre within the circle, of sanctuary within the citadel, constituted by the subjective life as a whole. Compared with this element of the stream, the other parts, even of the subjective life, seem transient external possessions, of which each in turn can be disowned, whilst that which disowns them remains. Now, *what is this self of all the other selves?*

Probably all men would describe it in much the same way up to a certain point. They would call it the *active* element in all consciousness; saying that whatever qualities a man's feelings may possess, or whatever content his thought may include, there is a spiritual something in him which seems to *go out* to meet these qualities and contents, whilst they seem to *come in* to be received by it. It is what welcomes or rejects. It presides over the perception of sensations, and by giving or withholding its assent it influences the movements they tend to arouse. It is the home of interest,—not the pleasant or the painful, not even pleasure or pain, as such, but that within us to which pleasure and pain, the pleasant and the painful, speak. It is the source of effort and attention, and the place from which appear to emanate the fiat of the will. A physiologist who should reflect upon it in his own person could hardly help, I should think, connecting it more or less vaguely with the process by which ideas or incoming sensations are 'reflected' or pass over into outward acts. Not necessarily that it should *be* this process or the mere feeling of this process, but that it should be in some close way *related* to this process; for it plays a part analogous to it in the psychic life, being a sort of junction at which sensory ideas terminate and from which motor ideas proceed, and forming a kind of link between the two. Being more incessantly there than any other single element of the mental life, the other elements end by seeming to accrete round it and to belong to it. It become opposed to them as the permanent is opposed to the changing and inconstant.

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One may, I think, without fear of being upset by any future Galtonian circulars, believe that all men must single out from the rest of what they call themselves some central principle of which each would recognize the foregoing to be a fair general description,—accurate enough, at any rate, to denote what is meant, and keep it unconfused with other things. The moment, however, they came to closer quarters with it, trying to define more accurately its precise nature, we should find opinions beginning to diverge. Some would say that it is a simple active substance, the soul, of which they are thus conscious; others, that it is nothing but a fiction, the imaginary being denoted by the pronoun I; and between these extremes of opinion all sorts of intermediaries would be found.

Later we must ourselves discuss them all, and sufficient to that day will be the evil thereof. *Now*, let us try to settle for ourselves as definitely as we can, just how this central nucleus of the Self may *feel*, no matter whether it be a spiritual substance or only a delusive word.

For this central part of the Self is *felt*. It may be all that Transcendentalists say it is, and all that Empiricists say it is into the bargain, but it is at any rate no *mere ens rationis*, cognized only in an intellectual way, and no *mere* summation of memories or *mere* sound of a word in our ears. It is something with which we also have direct sensible acquaintance, and which is as fully present at any moment of consciousness in which it *is* present, as in a whole lifetime of such moments. When, just now, it was called an abstraction, that did not mean that, like some general notion, it could not be presented in a particular experience. It only meant that in the stream of consciousness it never was found all alone. But when it is found, it is *felt*; just as the body is felt, the feeling of which is also an abstraction, because never is the body felt all alone, but always together with other things. *Now can we tell more precisely in what the feeling of this central active self consists*,—not necessarily as yet what the active self *is*, as a being or principle, but what we *feel* when we become aware of its existence?

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I think I can in my own case; and as what I say will be likely to meet with opposition if generalized (as indeed it may be in part inapplicable to other individuals), I had better continue in the first person, leaving my description, to be accepted by those to whose

introspection it may commend itself as true, and confessing my inability to meet the demands of others, if others there be.

First of all, I am aware of a constant play of furtherances and hindrances in my thinking, of checks and releases, tendencies which run with desire, and tendencies which run the other way. Among the matters I think of, some range themselves on the side of the thought's interests, whilst others play an unfriendly part thereto. The mutual inconsistencies and agreements, reinforcements and obstructions, which obtain amongst these objective matters reverberate backwards and produce what seem to be incessant reactions of my spontaneity upon them, welcoming or opposing, appropriating or disowning, striving with or against, saying yes or no. This palpitating inward life is, in me, that central nucleus which I just tried to describe in terms that all men might use.

But when I forsake such general descriptions and grapple with particulars, coming to the closest possible quarters with the facts, *it is difficult for me to detect in the activity any purely spiritual element at all. Whenever my introspective glance succeeds in turning round quickly enough to catch one of these manifestations of spontaneity in the act, all it can ever feel distinctly is some bodily process, for the most part taking place within the head.* Omitting for a moment what is obscure in these introspective results, let me try to state those particulars which to my own consciousness seem indubitable and distinct. [Pg 300]

In the first place, the acts of attending, assenting, negating, making an effort, are felt as movements of something in the head. In many cases it is possible to describe these movements quite exactly. In attending to either an idea or a sensation belonging to a particular sense-sphere, the movement is the adjustment of the sense-organ, felt as it occurs. I cannot think in visual terms, for example, without feeling a fluctuating play of pressures, convergences, divergences, and accommodations in my eyeballs. The direction in which the object is conceived to lie determines the character of these movements, the feeling of which becomes, for my consciousness, identified with the manner in which I make myself ready to receive the visible thing. My brain appears to me as if all shot across with lines of direction, of which I have become conscious as my attention has shifted from one sense-organ to another, in passing to successive outer things, or in following trains of varying sense-ideas.

When I try to remember or reflect, the movements in question, instead of being directed towards the periphery, seem to come from the periphery inwards and feel like a sort of *withdrawal* from the outer world. As far as I can detect, these feelings are due to an actual rolling outwards and upwards of the eyeballs, such as I believe occurs in me in sleep, and is the exact opposite of their action in fixating a physical thing. In reasoning, I find that I am apt to have a kind of vaguely localized diagram in my mind, with the various fractional objects of the thought disposed at particular points thereof; and the oscillations of my attention from one of them to another are most distinctly felt as alternations of direction in movements occurring inside the head.^[260] [Pg 301]

In consenting and negating, and in making a mental effort, the movements seem more complex, and I find them harder to describe. The opening and closing of the glottis play a great part in these operations, and, less distinctly, the movements of the soft palate, etc., shutting off the posterior nares from the mouth. My glottis is like a sensitive valve, intercepting my breath instantaneously at every mental hesitation or felt aversion to the objects of my thought, and as quickly opening, to let the air pass through my throat and nose, the moment the repugnance is overcome. The feeling of the movement of this air is, in me, one strong ingredient of the feeling of assent. The movements of the muscles of the brow and eyelids also respond very sensitively to every fluctuation in the agreeableness or disagreeableness of what comes before my mind.

In *effort* of any sort, contractions of the jaw-muscles and of those of respiration are added to those of the brow and glottis, and thus the feeling passes out of the head properly so called. It passes out of the head whenever the welcoming or rejecting of the object is *strongly* felt.

Then a set of feelings pour in from many bodily parts, all 'expressive' of my emotion, and the head-feelings proper are swallowed up in this larger mass.

In a sense, then, it may be truly said that, in one person at least, *the 'Self of selves,' when carefully examined, is found to consist mainly of the collection of these peculiar motions in the head or between the head and throat.* I do not for a moment say that this is *all* it consists of, for I fully realize how desperately hard is introspection in this field. But I feel quite sure that these cephalic motions are the portions of my innermost activity of which I am *most distinctly aware.* If the dim portions which I cannot yet define should prove to be like unto these distinct portions in me, and I like other men, *it would follow that our entire feeling of spiritual activity, or what commonly passes by that name, is really a feeling of bodily activities whose exact nature is by most men overlooked.*

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Now, without pledging ourselves in any way to adopt this hypothesis, let us dally with it for a while to see to what consequences it might lead if it were true.

In the first place, the nuclear part of the Self, intermediary between ideas and overt acts, would be a collection of activities physiologically in no essential way different from the overt acts themselves. If we divide all possible physiological acts into *adjustments* and *executions*, the nuclear self would be the adjustments collectively considered; and the less intimate, more shifting self, so far as it was active, would be the executions. But both adjustments and executions would obey the reflex type. Both would be the result of sensorial and ideational processes discharging either into each other within the brain, or into muscles and other parts outside. The peculiarity of the adjustments would be that they are minimal reflexes, few in number, incessantly repeated, constant amid great fluctuations in the rest of the mind's content, and entirely unimportant and uninteresting except through their uses in furthering or inhibiting the presence of various things, and actions before consciousness. These characters would naturally keep us from introspectively paying much attention to them in detail, whilst they would at the same time make us aware of them as a coherent group of processes, strongly contrasted with all the other things consciousness contained,—even with the other constituents of the 'Self,' material, social, or spiritual, as the case might be. They are reactions, and they are *primary* reactions. Everything arouses them; for objects which have no other effects will for a moment contract the brow and make the glottis close. It is as if all that visited the mind had to stand an entrance-examination, and just show its face so as to be either approved or sent back. These primary reactions are like the opening or the closing of the door. In the midst of psychic change they are the permanent core of turnings-towards and turnings-from, of yieldings and arrests, which naturally seem central and interior in comparison with the foreign matters, *a propos* to which they occur, and hold a sort of arbitrating, decisive position, quite unlike that held by any of the other constituents of the Me. It would not be surprising, then, if we were to feel them as the birthplace of conclusions and the starting point of acts, or if they came to appear as what we called a while back the 'sanctuary within the citadel' of our personal life.^[261]

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If they really were the innermost sanctuary, the *ultimate* one of all the selves whose being we can ever directly experience, it would follow that *all* that is experienced is, strictly considered, *objective*; that this Objective falls asunder into two contrasted parts, one realized as 'Self,' the other as 'not-Self;' and that over and above these parts there *is* nothing save the fact that they are known, the fact of the stream of thought being there as the indispensable subjective condition of their being experienced at all. But this *condition* of the experience is not one of the *things experienced* at the moment; this knowing is not immediately *known*. It is only known in subsequent reflection. Instead, then, of the stream of thought being one of *con*-sciousness, "thinking its own existence along with whatever else it thinks," (as Ferrier says) it might be better called a stream of *Sciousness* pure and simple, thinking objects of

some of which it makes what it calls a 'Me,' and only aware of its 'pure' Self in an abstract, hypothetic or conceptual way. Each 'section' of the stream would then be a bit of sciousness or knowledge of this sort, including and contemplating its 'me' and its 'not-me' as objects which work out their drama together, but not yet including or contemplating its own subjective being. The sciousness in question would be the *Thinker*, and the existence of this thinker would be given to us rather as a logical postulate than as that direct inner perception of spiritual activity which we naturally believe ourselves to have. 'Matter,' as something behind physical phenomena, is a postulate of this sort. Between the postulated Matter and the postulated Thinker, the sheet of phenomena would then swing, some of them (the 'realities') pertaining more to the matter, others (the fictions, opinions, and errors) pertaining more to the Thinker. But *who* the Thinker would be, or how many distinct Thinkers we ought to suppose in the universe, would all be subjects for an ulterior metaphysical inquiry.

Speculations like this traverse common-sense; and not only do they traverse common sense (which in philosophy is no insuperable objection) but they contradict the fundamental assumption of *every* philosophic school. Spiritualists, transcendentalists, and empiricists alike admit in us a continual direct perception of the thinking activity in the concrete. However they may otherwise disagree, they vie with each other in the cordiality of their recognition of our *thoughts* as the one sort of existent which skepticism cannot touch.^[262] I will therefore treat the last few pages as a parenthetical digression, and from now to the end of the volume revert to the path of common-sense again. I mean by this that I will continue to assume (as I have assumed all along, especially in the last chapter) a direct awareness of the process of our thinking as such, simply insisting on the fact that it is an even more inward and subtle phenomenon than most of us suppose. At the conclusion of the volume, however, I may permit myself to revert again to the doubts here provisionally mooted, and will indulge in some metaphysical reflections suggested by them.

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At present, then, the only conclusion I come to is the following: That (in some persons at least) the part of the innermost Self which is most vividly felt turns out to consist for the most part of a collection of cephalic movements of 'adjustments' which, for want of attention and reflection, usually fail to be perceived and classed as what they are; that over and above these there is an obscurer feeling of something more; but whether it be of fainter physiological processes, or of nothing objective at all, but rather of subjectivity as such, of thought become 'its own object,' must at present remain an open question,—like the question whether it be an indivisible active soul-substance, or the question whether it be a personification of the pronoun I, or any other of the guesses as to what its nature may be.

Farther than this we cannot as yet go clearly in our analysis of the Self's constituents. So let us proceed to the emotions of Self which they arouse.

2. SELF-FEELING.

These are primarily *self-complacency* and *self-dissatisfaction*. Of what is called 'self-love,' I will treat a little farther on. Language has synonyms enough for both primary feelings. Thus pride, conceit, vanity, self-esteem, arrogance, vainglory, on the one hand; and on the other modesty, humility, confusion, diffidence, shame, mortification, contrition, the sense of obloquy and personal despair. These two opposite classes of affection seem to be direct and elementary endowments of our nature. Associationists would have it that they are, on the other hand, secondary phenomena arising from a rapid computation of the sensible pleasures or pains to which our prosperous or debased personal predicament is likely to lead, the sum of the represented pleasures forming the self-satisfaction, and the sum of the represented pains forming the opposite feeling of shame. No doubt, when we are self-satisfied, we do

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fondly rehearse all possible rewards for our desert, and when in a fit of self-despair we forebode evil. But the mere expectation of reward *is* not the self-satisfaction, and the mere apprehension of the evil *is* not the self-despair, for there is a certain average tone of self-feeling which each one of us carries about with him, and which is independent of the objective reasons we may have for satisfaction or discontent. That is, a very meanly-conditioned man may abound in unfaltering conceit, and one whose success in life is secure and who is esteemed by all may remain diffident of his powers to the end.

One may say, however, that the normal *provocative* of self-feeling is one's actual success or failure, and the good or bad actual position one holds in the world. "He put in his thumb and pulled out a plum, and said what a good boy am I." A man with a broadly extended empirical Ego, with powers that have uniformly brought him success, with place and wealth and friends and fame, is not likely to be visited by the morbid diffidences and doubts about himself which he had when he was a boy. "Is not this great Babylon, which I have planted?" [263] Whereas he who has made one blunder after another, and still lies in middle life among the failures at the foot of the hill, is liable to grow all sicklied o'er with self-distrust, and to shrink from trials with which his powers can really cope. [Pg 307]

The emotions themselves of self-satisfaction and abasement are of a unique sort, each as worthy to be classed as a primitive emotional species as are, for example, rage or pain. Each has its own peculiar physiognomical expression. In self-satisfaction the extensor muscles are innervated, the eye is strong and glorious, the gait rolling and elastic, the nostril dilated, and a peculiar smile plays upon the lips. This whole complex of symptoms is seen in an exquisite way in lunatic asylums, which always contain some patients who are literally mad with conceit, and whose fatuous expression and absurdly strutting or swaggering gait is in tragic contrast with their lack of any valuable personal quality. It is in these same castles of despair that we find the strongest examples of the opposite physiognomy, in good people who think they have committed 'the unpardonable sin' and are lost forever, who crouch and cringe and slink from notice, and are unable to speak aloud or look us in the eye. Like fear and like anger, in similar morbid conditions, these opposite feelings of Self may be aroused with no adequate exciting cause. And in fact we ourselves know how the barometer of our self-esteem and confidence rises and falls from one day to another through causes that seem to be visceral and organic rather than rational, and which certainly answer to no corresponding variations in the esteem in which we are held by our friends. Of the origin of these emotions in the race, we can speak better when we have treated of—

3. SELF-SEEKING AND SELF-PRESERVATION.

These words cover a large number of our fundamental instinctive impulses. We have those of *bodily self-seeking*, those of *social self-seeking*, and those of *spiritual self-seeking*.

All the ordinary useful reflex actions and movements of alimentation and defence are acts of bodily self-preservation. Fear and anger prompt to acts that are useful in the same way. Whilst if by self-seeking we mean the providing for the future as distinguished from maintaining the present, we must class both anger and fear with the hunting, the acquisitive, the home-constructing and the tool-constructing instincts, as impulses to self-seeking of the bodily kind. Really, however, these latter instincts, with amativeness, parental fondness, curiosity and emulation, seek not only the development of the bodily Self, but that of the material Self in the widest possible sense of the word. [Pg 308]

Our *social self-seeking*, in turn, is carried on directly through our amativeness and friendliness, our desire to please and attract notice and admiration, our emulation and jealousy, our love of glory, influence, and power, and indirectly through whichever of the material self-seeking impulses prove serviceable as means to social ends. That the direct social self-seeking impulses are probably pure instincts is easily seen. The noteworthy thing about the desire to be 'recognized' by others is that its strength has so little to do with the

worth of the recognition computed in sensational or rational terms. We are crazy to get a visiting-list which shall be large, to be able to say when any one is mentioned, "Oh! I know him well," and to be bowed to in the street by half the people we meet. Of course distinguished friends and admiring recognition are the most desirable—Thackeray somewhere asks his readers to confess whether it would not give each of *them* an exquisite pleasure to be met walking down Pall Mall with a duke on either arm. But in default of dukes and envious salutations almost anything will do for some of us; and there is a whole race of beings to-day whose passion is to keep their names in the newspapers, no matter under what heading, 'arrivals and departures,' 'personal paragraphs,' 'interviews,'—gossip, even scandal, will suit them if nothing better is to be had. Guiteau, Garfield's assassin, is an example of the extremity to which this sort of craving for the notoriety of print may go in a pathological case. The newspapers bounded his mental horizon; and in the poor wretch's prayer on the scaffold, one of the most heartfelt expressions was: "The newspaper press of this land has a big bill to settle with thee, O Lord!"

Not only the people but the places and things I know enlarge my Self in a sort of metaphoric social way. "*Ça me connaît*," as the French workman says of the implement he can use well. So that it comes about that persons for whose *opinion* we care nothing are nevertheless persons whose notice we woo; and that many a man truly great, many a woman truly fastidious in most respects, will take a deal of trouble to dazzle some insignificant cad whose whole personality they heartily despise.

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Under the head of *spiritual self-seeking* ought to be included every impulse towards psychic progress, whether intellectual, moral, or spiritual in the narrow sense of the term. It must be admitted, however, that much that commonly passes for spiritual self-seeking in this narrow sense is only material and social self-seeking beyond the grave. In the Mohammedan desire for paradise and the Christian aspiration not to be damned in hell, the materiality of the goods sought is undisguised. In the more positive and refined view of heaven many of its goods, the fellowship of the saints and of our dead ones, and the presence of God, are but social goods of the most exalted kind. It is only the search of the redeemed inward nature, the spotlessness from sin, whether here or hereafter, that can count as spiritual self-seeking pure and undefined.

But this broad external review of the facts of the life of the Self will be incomplete without some account of the

RIVALRY AND CONFLICT OF THE DIFFERENT SELVES.

With most objects of desire, physical nature restricts our choice to but one of many represented goods, and even so it is here. I am often confronted by the necessity of standing by one of my empirical selves and relinquishing the rest. Not that I would not, if I could, be both handsome and fat and well dressed, and a great athlete, and make a million a year, be a wit, a *bon-vivant*, and a lady-killer, as well as a philosopher; a philanthropist, statesman, warrior, and African explorer, as well as a 'tone-poet' and saint. But the thing is simply impossible. The millionaire's work would run counter to the saint's; the *bon-vivant* and the philanthropist would trip each other up; the philosopher and the lady-killer could not well keep house in the same tenement of clay. Such different characters may conceivably at the outset of life be alike *possible* to a man. But to make any one of them actual, the rest must more or less be suppressed. So the seeker of his truest, strongest, deepest self must review the list carefully, and pick out the one on which to stake his salvation. All other selves thereupon become unreal, but the fortunes of this self are real. Its failures are real failures, its triumphs real triumphs, carrying shame and gladness with them. This is as strong an example as there is of that selective industry of the mind on which I insisted some pages back ([p. 284](#) ff.). Our thought, incessantly deciding, among many things of a kind, which

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ones for it shall be realities, here chooses one of many possible selves or characters, and forthwith reckons it no shame to fail in any of those not adopted expressly as its own.

I, who for the time have staked my all on being a psychologist, am mortified if others know much more psychology than I. But I am contented to wallow in the grossest ignorance of Greek. My deficiencies there give me no sense of personal humiliation at all. Had I 'pretensions' to be a linguist, it would have been just the reverse. So we have the paradox of a man shamed to death because he is only the second pugilist or the second oarsman in the world. That he is able to beat the whole population of the globe minus one is nothing; he has 'pitted' himself to beat that one; and as long as he doesn't do that nothing else counts. He is to his own regard as if he were not, indeed he *is* not.

Yonder puny fellow, however, whom every one can beat, suffers no chagrin about it, for he has long ago abandoned the attempt to 'carry that line,' as the merchants say, of self at all. With no attempt there can be no failure; with no failure no humiliation. So our self-feeling in this world depends entirely on what we *back* ourselves to be and do. It is determined by the ratio of our actualities to our supposed potentialities; a fraction of which our pretensions are the denominator and the numerator our success: thus, Self-esteem = Success/Pretensions. Such a fraction may be increased as well by diminishing the denominator as by increasing the numerator.^[264] To give up pretensions is as blessed a relief as to get them gratified; and where disappointment is incessant, and the struggle unending, this is what men will always do. The history of evangelical theology, with its conviction of sin, its self-despair, and its abandonment of salvation by works, is the deepest of possible examples, but we meet others in every walk of life. There is the strangest lightness about the heart when one's nothingness in a particular line is once accepted in good faith. *All* is not bitterness in the lot of the lover sent away by the final inexorable 'No.' Many Bostonians, *crede experto* (and inhabitants of other cities, too, I fear), would be happier women and men to-day, if they could once for all abandon the notion of keeping up a Musical Self, and without shame let people hear them call a symphony a nuisance. How pleasant is the day when we give up striving to be young,—or slender! Thank God! we say, *those* illusions are gone. Everything added to the Self is a burden as well as a pride. A certain man who lost every penny during our civil war went and actually rolled in the dust, saying he had not felt so free and happy since he was born.

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Once more, then, our self-feeling is in our power. As Carlyle says: "Make thy claim of wages a zero, then hast thou the world under thy feet. Well did the wisest of our time write, it is only with *renunciation* that life, properly speaking, can be said to begin."

Neither threats nor pleadings can move a man unless they touch some one of his potential or actual selves. Only thus can we, as a rule, get a 'purchase' on another's will. The first care of diplomatists and monarchs and all who wish to rule or influence is, accordingly, to find out their victim's strongest principle of self-regard, so as to make that the fulcrum of all appeals. But if a man has given up those things which are subject to foreign fate, and ceased to regard them as parts of himself at all, we are well-nigh powerless over him. The Stoic receipt for contentment was to dispossess yourself in advance of all that was out of your own power,—then fortune's shocks might rain down unfelt. Epictetus exhorts us, by thus narrowing and at the same time solidifying our Self to make it invulnerable: "I must die; well, but must I die groaning too? I will speak what appears to be right, and if the despot says, then I will put you to death, I will reply, 'When did I ever tell you that I was immortal? You will do your part and I mine; it is yours to kill and mine to die intrepid; yours to banish, mine to depart untroubled.' How do we act in a voyage? We choose the pilot, the sailors, the hour. Afterwards comes a storm. What have I to care for? My part is performed. This matter belongs to the pilot. But the ship is sinking; what then have I to do? That which alone I can do—submit to being drowned without fear, without clamor or accusing of God, but as one who knows that what is born must likewise die."^[265]

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This Stoic fashion, though efficacious and heroic enough in its place and time, is, it must be confessed, only possible as an habitual mood of the soul to narrow and unsympathetic characters. It proceeds altogether by exclusion. If I am a Stoic, the goods I cannot appropriate cease to be *my* goods, and the temptation lies very near to deny that they are goods at all. We find this mode of protecting the Self by exclusion and denial very common among people who are in other respects not Stoics. All narrow people *intrench* their Me, they *retract* it,—from the region of what they cannot securely possess. People who don't resemble them, or who treat them with indifference, people over whom they gain no influence, are people on whose existence, however meritorious it may intrinsically be, they look with chill negation, if not with positive hate. Who will not be mine I will exclude from existence altogether; that is, as far as I can make it so, such people shall be as if they were not.^[266] Thus may a certain absoluteness and definiteness in the outline of my Me console me for the smallness of its content.

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Sympathetic people, on the contrary, proceed by the entirely opposite way of expansion and inclusion. The outline of their self often gets uncertain enough, but for this the spread of its content more than atones. *Nil humani a me alienum*. Let them despise this little person of mine, and treat me like a dog, *I* shall not negate *them* so long as I have a soul in my body. They are realities as much as I am. What positive good is in them shall be mine too, etc., etc. The magnanimity of these expansive natures is often touching indeed. Such persons can feel a sort of delicate rapture in thinking that, however sick, ill-favored, mean-conditioned, and generally forsaken they may be, they yet are integral parts of the whole of this brave world, have a fellow's share in the strength of the dray-horses, the happiness of the young people, the wisdom of the wise ones, and are not altogether without part or lot in the good fortunes of the Vanderbilts and the Hohenzollerns themselves. Thus either by negating or by embracing, the Ego may seek to establish itself in reality. He who, with Marcus Aurelius, can truly say, "O Universe, I wish all that thou wishest," has a self from which every trace of negativity and obstructiveness has been removed—no wind can blow except to fill its sails.

A tolerably unanimous opinion ranges the different selves of which a man may be 'seized and possessed,' and the consequent different orders of his self-regard, in an *hierarchical scale, with the bodily Self at the bottom, the spiritual Self at top, and the extracorporeal material selves and the various social selves between*. Our merely natural self-seeking would lead us to aggrandize all these selves; we give up deliberately only those among them which we find we cannot keep. Our unselfishness is thus apt to be a 'virtue of necessity'; and it is not without all show of reason that cynics quote the fable of the fox and the grapes in describing our progress therein. But this is the moral education of the race; and if we agree in the result that on the whole the selves we can keep are the intrinsically best, we need not complain of being led to the knowledge of their superior worth in such a tortuous way.

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Of course this is not the only way in which we learn to subordinate our lower selves to our higher. A direct ethical judgment unquestionably also plays its part, and last, not least, we apply to our own persons judgments originally called forth by the acts of others. It is one of the strangest laws of our nature that many things which we are well satisfied with in ourselves disgust us when seen in others. With another man's bodily 'hoggishness' hardly anyone has any sympathy;—almost as little with his cupidity, his social vanity and eagerness, his jealousy, his despotism, and his pride. Left absolutely to myself I should probably allow all these spontaneous tendencies to luxuriate in me unchecked, and it would be long before I formed a distinct notion of the order of their subordination. But having constantly to pass judgment on my associates, I come ere long to see, as Herr Horwicz says, my own lusts in the mirror of the lusts of others, and to *think* about them in a very different

way from that in which I simply *feel*. Of course, the moral generalities which from childhood have been instilled into me accelerate enormously the advent of this reflective judgment on myself.

So it comes to pass that, as aforesaid, men have arranged the various selves which they may seek in an hierarchical scale according to their worth. A certain amount of bodily selfishness is required as a basis for all the other selves. But too much sensuality is despised, or at best condoned on account of the other qualities of the individual. The wider material selves are regarded as higher than the immediate body. He is esteemed a poor creature who is unable to forego a little meat and drink and warmth and sleep for the sake of getting on in the world. The social self as a whole, again, ranks higher than the material self as a whole. We must care more for our honor, our friends, our human ties, than for a sound skin or wealth. And the spiritual self is so supremely precious that, rather than lose it, a man ought to be willing to give up friends and good fame, and property, and life itself.

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In each kind of self, material, social, and spiritual, men distinguish between the immediate and actual, and the remote and potential, between the narrower and the wider view, to the detriment of the former and advantage of the latter. One must forego a present bodily enjoyment for the sake of one's general health; one must abandon the dollar in the hand for the sake of the hundred dollars to come; one must make an enemy of his present interlocutor if thereby one makes friends of a more valued circle; one must go without learning and grace, and wit, the better to compass one's soul's salvation.

Of all these wider, more potential selves, *the potential social self* is the most interesting, by reason of certain apparent paradoxes to which it leads in conduct, and by reason of its connection with our moral and religious life. When for motives of honor and conscience I brave the condemnation of my own family, club, and 'set'; when, as a protestant, I turn catholic; as a catholic, freethinker; as a 'regular practitioner,' homœopath, or what not, I am always inwardly strengthened in my course and steeled against the loss of my actual social self by the thought of other and better *possible* social judges than those whose verdict goes against me now. The ideal social self which I thus seek in appealing to their decision may be very remote: it may be represented as barely possible. I may not hope for its realization during my lifetime; I may even expect the future generations, which would approve me if they knew me, to know nothing about me when I am dead and gone. Yet still the emotion that beckons me on is indubitably the pursuit of an ideal social self, of a self that is at least *worthy* of approving recognition by the highest *possible* judging companion, if such companion there be.^[267] This self is the true, the intimate, the ultimate, the permanent Me which I seek. This judge is God, the Absolute Mind, the 'Great Companion.' We hear, in these days of scientific enlightenment, a great deal of discussion about the efficacy of prayer; and many reasons are given us why we should not pray, whilst others are given us why we should. But in all this very little is said of the reason why we *do* pray, which is simply that we cannot *help* praying. It seems probable that, in spite of all that 'science' may do to the contrary, men will continue to pray to the end of time, unless their mental nature changes in a manner which nothing we know should lead us to expect. The impulse to pray is a necessary consequence of the fact that whilst the innermost of the empirical selves of a man is a Self of the *social* sort, it yet can find its only adequate *Socius* in an ideal world.

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All progress in the social Self is the substitution of higher tribunals for lower; this ideal tribunal is the highest; and most men, either continually or occasionally, carry a reference to it in their breast. The humblest outcast on this earth can feel himself to be real and valid by means of this higher recognition. And, on the other hand, for most of us, a world with no such inner refuge when the outer social self failed and dropped from us would be the abyss of horror. I say 'for most of us,' because it is probable that individuals differ a good deal in the degree in which they are haunted by this sense of an ideal spectator. It is a much more essential part of the consciousness of some men than of others. Those who have the most of it are possibly the most *religious* men. But I am sure that even those who say they are

altogether without it deceive themselves, and really have it in some degree. Only a non-gregarious animal could be completely without it. Probably no one can make sacrifices for 'right,' without to some degree personifying the principle of right for which the sacrifice is made, and expecting thanks from it. *Complete* social unselfishness, in other words, can hardly exist; *complete* social suicide hardly occur to a man's mind. Even such texts as Job's, "Though He slay me yet will I trust Him," or Marcus Aurelius's, "If gods hate me and my children, there is a reason for it," can least of all be cited to prove the contrary. For beyond all doubt Job revelled in the thought of Jehovah's recognition of the worship after the slaying should have been done; and the Roman emperor felt sure the Absolute Reason would not be all indifferent to his acquiescence in the gods' dislike. The old test of piety, "Are you willing to be damned for the glory of God?" was probably never answered in the affirmative except by those who felt sure in their heart of hearts that God would 'credit' them with their willingness, and set more store by them thus than if in His unfathomable scheme He had not damned them at all.

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All this about the impossibility of suicide is said on the supposition of *positive* motives. When possessed by the emotion of *fear*, however, we are in a *negative* state of mind; that is, our desire is limited to the mere banishing of something, without regard to what shall take its place. In this state of mind there can unquestionably be genuine thoughts, and genuine acts, of suicide, spiritual and social, as well as bodily. Anything, *anything*, at such times, so as to escape and not to be! But such conditions of suicidal frenzy are pathological in their nature and run dead against everything that is regular in the life of the Self in man.

WHAT SELF IS LOVED IN 'SELF-LOVE'?

We must now try to interpret the facts of self-love and self-seeking a little more delicately from within.

A man in whom self-seeking of any sort is largely developed is said to be selfish.^[268] He is on the other hand called unselfish if he shows consideration for the interests of other selves than his own. Now what is the intimate *nature* of the selfish emotion in him? and what is the primary *object* of its regard? We have described him pursuing and fostering as his self first one set of things and then another; we have seen the same set of facts gain or lose interest in his eyes, leave him indifferent, or fill him either with triumph or despair according as he made pretensions to appropriate them, treated them as if they were potentially or actually parts of himself, or not. We know how little it matters to us whether *some* man, a man taken at large and in the abstract, prove a failure or succeed in life,—he may be hanged for aught we care,—but we know the utter momentousness and terribleness of the alternative when the man is the one whose name we ourselves bear. *I* must not be a failure, is the very loudest of the voices that clamor in each of our breasts: let fail who may, *I* at least must succeed. Now the first conclusion which these facts suggest is that each of us is animated by a *direct feeling of regard for his own pure principle of individual existence*, whatever that may be, taken merely as such. It appears as if all our concrete manifestations of selfishness might be the conclusions of as many syllogisms, each with this principle as the subject of its major premiss, thus: Whatever is me is precious; this is me; therefore this is precious; whatever is mine must not fail; this is mine; therefore this must not fail, etc. It appears, I say, as if this principle inoculated all it touched with its own intimate quality of worth; as if, previous to the touching, everything might be matter of indifference, and nothing interesting in its own right; as if my regard for my own body even were an interest not simply in this body, but in this body only so far as it is mine.

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But what is this abstract numerical principle of identity, this 'Number One' within me, for which, according to proverbial philosophy, I am supposed to keep so constant a 'lookout'? Is it the inner nucleus of my spiritual self, that collection of obscurely felt 'adjustments,' *plus* perhaps that still more obscurely perceived subjectivity as such, of which we recently

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spoke? Or is it perhaps the concrete stream of my thought in its entirety, or some one section of the same? Or may it be the indivisible Soul-Substance, in which, according to the orthodox tradition, my faculties inhere? Or, finally, can it be the mere pronoun I? Surely it is none of these things, that self for which I feel such hot regard. Though all of them together were put within me, I should still be cold, and fail to exhibit anything worthy of the name of selfishness or of devotion to 'Number One.' To have a self that I can *care for*, nature must first present me with some *object* interesting enough to make me instinctively wish to appropriate it for its *own* sake, and out of it to manufacture one of those material, social, or spiritual selves, which we have already passed in review. We shall find that all the facts of rivalry and substitution that have so struck us, all the shiftings and expansions and contractions of the sphere of what shall be considered me and mine, are but results of the fact that certain *things* appeal to primitive and instinctive impulses of our nature, and that we follow their destinies with an excitement that owes nothing to a reflective source. These objects our consciousness treats as the primordial constituents of its Me. Whatever other objects, whether by association with the fate of these, or in any other way, come to be followed with the same sort of interest, form our remoter and more secondary self. *The words ME, then, and SELF, so far as they arouse feeling and connote emotional worth, are OBJECTIVE designations, meaning ALL THE THINGS which have the power to produce in a stream of consciousness excitement of a certain peculiar sort.* Let us try to justify this proposition in detail.

The most palpable selfishness of a man is his bodily selfishness; and his most palpable self is the body to which that selfishness relates. Now I say that he identifies himself with this body because he loves *it*, and that he does not love it because he finds it to be identified with himself. Reverting to natural history-psychology will help us to see the truth of this. In the chapter on Instincts we shall learn that every creature has a certain selective interest in certain portions of the world, and that this interest is as often connate as acquired. Our *interest in things* means the attention and emotion which the thought of them will excite, and the actions which their presence will evoke. Thus every species is particularly interested in its own prey or food, its own enemies, its own sexual mates, and its own young. These things fascinate by their intrinsic power to do so; they are cared for for their own sakes.

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Well, it stands not in the least otherwise with our bodies. They too are percepts in our objective field—they are simply the most interesting percepts there. What happens to them excites in us emotions and tendencies to action more energetic and habitual than any which are excited by other portions of the 'field.' What my comrades call my bodily selfishness or self-love, is nothing but the sum of all the outer acts which this interest in my body spontaneously draws from me. My 'selfishness' is here but a descriptive name for grouping together the outward symptoms which I show. When I am led by self-love to keep my seat whilst ladies stand, or to grab something first and cut out my neighbor, what I really love is the comfortable seat, is the thing itself which I grab. I love them primarily, as the mother loves her babe, or a generous man an heroic deed. Wherever, as here, self-seeking is the outcome of simple instinctive propensity, it is but a name for certain reflex acts. Something rivets my attention fatally, and fatally provokes the 'selfish' response. Could an automaton be so skilfully constructed as to ape these acts, it would be called selfish as properly as I. It is true that I am no automaton, but a thinker. But my thoughts, like my acts, are here concerned only with the outward things. They need neither know nor care for any pure principle within. In fact the more utterly 'selfish' I am in this primitive way, the more blindly absorbed my thought will be in the objects and impulses of my lusts, and the more devoid of any inward looking glance. A baby, whose consciousness of the pure Ego, of himself as a thinker, is not usually supposed developed, is, in this way, as some German has said, '*der vollendeteste Egoist.*' His corporeal person, and what ministers to its needs, are the only self he can possibly be said to love. His so-called self-love is but a name for his insensibility to all but this one set of things. It may be that he needs a pure principle of subjectivity, a soul or pure Ego (he certainly needs a stream of thought) to make him sensible at all to anything,

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to make him discriminate and love *überhaupt*,—how that may be, we shall see ere long; but this pure Ego, which would then be the *condition* of his loving, need no more be the *object* of his love than it need be the object of his thought. If his interests lay altogether in other bodies than his own, if all his instincts were altruistic and all his acts suicidal, still he would need a principle of *consciousness* just as he does now. Such a principle cannot then be the principle of his bodily *selfishness* any more than it is the principle of any other tendency he may show.

So much for the bodily self-love. But my *social* self-love, my interest in the images other men have framed of me, is also an interest in a set of objects external to my thought. These thoughts in other men's minds are out of my mind and 'ejective' to me. They come and go, and grow and dwindle, and I am puffed up with pride, or blush with shame, at the result, just as at my success or failure in the pursuit of a material thing. So that here again, just as in the former case, the pure principle seems out of the game as an *object* of regard, and present only as the general form or condition under which the regard and the thinking go on in me at all.

But, it will immediately be objected, this is giving a mutilated account of the facts. Those images of me in the minds of other men are, it is true, things outside of me, whose changes I perceive just as I perceive any other outward change. But the pride and shame which I feel are not concerned merely with *those* changes. I feel as if something else had changed too, when I perceive my image in your mind to have changed for the worse, something in me to which that image belongs, and which a moment ago I felt inside of me, big and strong and lusty, but now weak, contracted, and collapsed. Is not this latter change the change I feel the shame about? Is not the condition of this thing inside of me the proper object of my egoistic concern, of my self-regard? And is it not, after all, my pure Ego, my bare numerical principle of distinction from other men, and no empirical part of me at all?

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No, it is no such pure principle, it is simply my total empirical selfhood again, my historic Me, a collection of objective facts, to which the depreciated image in your mind 'belongs.' In what capacity is it that I claim and demand a respectful greeting from you instead of this expression of disdain? It is not as being a bare I that I claim it; it is as being an I who has always been treated with respect, who belongs to a certain family and 'set,' who has certain powers, possessions, and public functions, sensibilities, duties, and purposes, and merits and deserts. All this is what your disdain negates and contradicts; this is 'the thing inside of me' whose changed treatment I feel the shame about; this is what was lusty, and now, in consequence of your conduct, is collapsed; and this certainly is an empirical objective thing. Indeed, the thing that is felt modified and changed for the worse during my feeling of shame is often more concrete even than this,—it is simply my bodily person, in which your conduct immediately and without any reflection at all on my part works those muscular, glandular, and vascular changes which together make up the 'expression' of shame. In this instinctive, reflex sort of shame, the body is just as much the entire vehicle of the self-feeling as, in the coarser cases which we first took up, it was the vehicle of the self-seeking. As, in simple 'hoggishness,' a succulent morsel gives rise, by the reflex mechanism, to behavior which the bystanders find 'greedy,' and consider to flow from a certain sort of 'self-regard;' so here your disdain gives rise, by a mechanism quite as reflex and immediate, to another sort of behavior, which the bystanders call 'shame-faced' and which they consider due to another kind of self-regard. But in both cases there may be no particular self *regarded* at all by the mind: and the name self-regard may be only a descriptive title imposed from without the reflex acts themselves, and the feelings that immediately result from their discharge.

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After the bodily and social selves come the spiritual. But which of my spiritual selves do I really care for? My Soul-substance? my 'transcendental Ego, or Thinker'? my pronoun I? my subjectivity as such? my nucleus of cephalic adjustments? or my more phenomenal and perishable powers, my loves and hates, willingnesses and sensibilities, and the like? Surely

the latter. But they, relatively to the central principle, whatever it may be, are external and objective. They come and go, and it remains—"so shakes the magnet, and so stands the pole." It may indeed have to be there for them to be loved, but being there is not identical with being loved itself.

To sum up, then, *we see no reason to suppose that 'self-love' is primarily, or secondarily, or ever, love for one's mere principle of conscious identity.* It is always love for something which, as compared with that principle, is superficial, transient, liable to be taken up or dropped at will.

And zoological psychology again comes to the aid of our understanding and shows us that this must needs be so. In fact, in answering the question what things it is that a man loves in his self-love, we have implicitly answered the farther question, of why he loves them.

Unless his consciousness were something more than cognitive, unless it experienced a partiality for certain of the objects, which, in succession, occupy its ken, it could not long maintain itself in existence; for, by an inscrutable necessity, each human mind's appearance on this earth is conditioned upon the integrity of the body with which it belongs, upon the treatment which that body gets from others, and upon the spiritual dispositions which use it as their tool, and lead it either towards longevity or to destruction. *Its own body, then, first of all, its friends next, and finally its spiritual dispositions, MUST be the supremely interesting OBJECTS for each human mind.* Each mind, to begin with, must have a certain minimum of selfishness in the shape of instincts of bodily self-seeking in order to exist. This minimum must be there as a basis for all farther conscious acts, whether of self-negation or of a selfishness more subtle still. All minds must have come, by the way of the survival of the fittest, if by no directer path, to take an intense interest in the bodies to which they are yoked, altogether apart from any interest in the pure Ego which they also possess.

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And similarly with the images of their person in the minds of others. I should not be extant now had I not become sensitive to looks of approval or disapproval on the faces among which my life is cast. Looks of contempt cast on other persons need affect me in no such peculiar way. Were my mental life dependent exclusively on some other person's welfare, either directly or in an indirect way, then natural selection would unquestionably have brought it about that I should be as sensitive to the social vicissitudes of that other person as I now am to my own. Instead of being egoistic I should be spontaneously altruistic, then. But in this case, only partially realized in actual human conditions, though the self I empirically love would have changed, my pure Ego or Thinker would have to remain just what it is now.

My spiritual powers, again, must interest me more than those of other people, and for the same reason. I should not be here at all unless I had cultivated them and kept them from decay. And the same law which made me once care for them makes me care for them still.

My own body and what ministers to its needs are thus the primitive object, instinctively determined, of my egoistic interests. Other objects may become interesting derivatively through association with any of these things, either as means or as habitual concomitants; and so in a thousand ways the primitive sphere of the egoistic emotions may enlarge and change its boundaries.

This sort of interest is really the *meaning of the word 'my.'* Whatever has it is *eo ipso* a part of me. My child, my friend dies, and where he goes I feel that part of myself now is and evermore shall be:

"For this losing is true dying;
This is lordly man's down-lying;
This his slow but sure reclining,
Star by star his world resigning."

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The fact remains, however, that certain special sorts of thing tend primordially to possess this interest, and form the *natural* me. But all these things are *objects*, properly so called, to the subject which does the thinking.^[269] And this latter fact upsets at once the dictum of the old-fashioned sensationalist psychology, that altruistic passions and interests are contradictory to the nature of things, and that if they appear anywhere to exist, it must be as secondary products, resolvable at bottom into cases of selfishness, taught by experience a hypocritical disguise. If the zoological and evolutionary point of view is the true one, there is no reason why any object whatever *might* not arouse passion and interest as primitively and instinctively as any other, whether connected or not with the interests of the me. The phenomenon of passion is in origin and essence the same, whatever be the target upon which it is discharged; and what the target actually happens to be is solely a question of fact. I might conceivably be as much fascinated, and as primitively so, by the care of my neighbor's body as by the care of my own. The only check to such exuberant altruistic interests is natural selection, which would weed out such as were very harmful to the individual or to his tribe. Many such interests, however, remain unweeded out—the interest in the opposite sex, for example, which seems in mankind stronger than is called for by its utilitarian need; and alongside of them remain interests, like that in alcoholic intoxication, or in musical sounds, which, for aught we can see, are without any utility whatever. The sympathetic instincts and the egoistic ones are thus co-ordinate. They arise, so far as we can tell, on the same psychologic level. The only difference between them is, that the instincts called egoistic form much the larger mass.

The only author whom I know to have discussed the question whether the 'pure Ego,' *per se*, can be an object of regard, is Herr Horwicz, in his extremely able and acute *Psychologische Analysen*. He too says that all self-regard is regard for certain objective things. He disposes so well of one kind of objection that I must conclude by quoting a part of his own words:

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First, the objection:

"The fact is indubitable that one's own children always pass for the prettiest and brightest, the wine from one's own cellar for the best—at least for its price,—one's own house and horses for the finest. With what tender admiration do we con over our own little deed of benevolence! our own frailties and misdemeanors, how ready we are to acquit ourselves for them, when we notice them at all, on the ground of 'extenuating circumstances'! How much more really comic are our own jokes than those of others, which, unlike ours, will not bear being repeated ten or twelve times over! How eloquent, striking, powerful, our own speeches are! How appropriate our own address! In short, how much more intelligent, soulful, better, is everything about us than in anyone else. The sad chapter of artists' and authors' conceit and vanity belongs here.

"The prevalence of this obvious preference which we feel for everything of our own is indeed striking. Does it not look as if our dear Ego must first lend its color and flavor to anything in order to make it please us?... Is it not the simplest explanation for all these phenomena, so consistent among themselves, to suppose that the Ego, the self, which forms the origin and centre of our *thinking* life, is at the same time the original and central object of our life of feeling, and the ground both of whatever special ideas and of whatever special feelings ensue?"

Herr Horwicz goes on to refer to what we have already noticed, that various things which disgust us in others do not disgust us at all in ourselves.

"To most of us even the bodily warmth of another, for example the chair warm from another's sitting, is felt unpleasantly, whereas there is nothing disagreeable in the warmth of the chair in which we have been sitting ourselves."

After some further remarks, he replies to these facts and reasonings as follows;

"We may with confidence affirm that our own possessions in most cases please us better [not because they are ours], but simply because we know them better, 'realize' them more intimately, feel them more deeply. We learn to appreciate what is ours in all its details and shadings, whilst the goods of others appear to us in coarse outlines and rude averages. Here are some examples: A piece of music which one plays one's self is heard and understood better than when it is played by another. We get more exactly all the details, penetrate more deeply into the musical thought. We may meanwhile perceive perfectly well that the other person is the better performer, and yet nevertheless—at times—get more enjoyment from our own playing because it brings the melody and harmony so much nearer home to us. This case may almost be taken as typical for the other cases of self-love. On close examination, we shall almost always find that a great part of our feeling about what is ours is due to the fact that we *live closer* to our own things, and so feel them more thoroughly and deeply. As a friend of mine was about to marry, he often bored me by the repeated and minute way in which he would discuss the details of his new household arrangements. I wondered that so intellectual a man should be so deeply interested in things of so external a nature. But as I entered, a few years later, the same condition myself, these matters acquired for me an entirely different interest, and it became my turn to turn them over and talk of them unceasingly.... The reason was simply this, that in the first instance I *understood* nothing of these things and their importance for domestic comfort, whilst in the latter ease they came home to me with irresistible urgency, and vividly took possession of my fancy. So it is with many a one who mocks at decorations and titles, until he gains one himself. And this is also surely the reason why one's own portrait or reflection in the mirror is so peculiarly interesting a thing to contemplate ... not on account of any absolute '*c'est moi,*' but just as with the music played by ourselves. What greets our eyes is what we know best, most deeply understand; because we ourselves have felt it and lived through it. We know what has ploughed these furrows, deepened these shadows, blanched this hair; and other faces may be handsomer, but none can speak to us or interest us like this."^[270]

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Moreover, this author goes on to show that our own things are *fuller* for us than those of others because of the memories they awaken and the practical hopes and expectations they arouse. This alone would emphasize them, apart from any value derived from their belonging to ourselves. We may conclude with him, then, that *an original central self-feeling can never explain the passionate warmth of our self-regarding emotions, which must, on the contrary, be addressed directly to special things less abstract and empty of content. To these things the name of 'self' may be given, or to our conduct towards them the name of 'selfishness,' but neither in the self nor the selfishness does the pure Thinker play the 'title-role.'*

Only one more point connected with our self-regard need be mentioned. We have spoken of it so far as active instinct or emotion. It remains to speak of it as cold *intellectual self-estimation*. We may weigh our own Me in the balance of praise and blame as easily as we

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weigh other people,—though with difficulty quite as fairly. The *just* man is the one who can weigh himself impartially. Impartial weighing presupposes a rare faculty of abstraction from the vividness with which, as Herr Horwicz has pointed out, things known as intimately as our own possessions and performances appeal to our imagination; and an equally rare power of vividly representing the affairs of others. But, granting these rare powers, there is no reason why a man should not pass judgment on himself quite as objectively and well as on anyone else. No matter how he *feels* about himself, unduly elated or unduly depressed, he may still truly *know* his own worth by measuring it by the outward standard he applies to other men, and counteract the injustice of the feeling he cannot wholly escape. This self-measuring process has nothing to do with the instinctive self-regard we have hitherto been dealing with. Being merely one application of intellectual comparison, it need no longer detain us here. Please note again, however, how the pure Ego appears merely as the vehicle in which the estimation is carried on, the objects estimated being all of them facts of an empirical sort,^[271] one's body, one's credit, one's fame, one's intellectual ability, one's goodness, or whatever the case may be.

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The empirical life of Self is divided, as below, into

	MATERIAL.	SOCIAL.	SPIRITUAL.
SELF-SEEKING.	Bodily Appetites and Instincts	Desire to please, be noticed, admired, etc.	Intellectual, Moral and Religious Aspiration, Conscientiousness.
	Love of Adornment, Foppery, Acquisitiveness, Constructiveness.	Sociability, Emulation, Envy, Love, Pursuit of Honor, Ambition, etc.	
	Love of Home, etc.		
SELF-ESTIMATION.	Personal Vanity, Modesty, etc.	Social and Family Pride, Vainglory, Snobbery, Humility, Shame, etc.	Sense of Moral or Mental Superiority, Purity, etc.
	Pride of Wealth, Fear of Poverty		Sense of Inferiority or of Guilt

THE PURE EGO.

Having summed up in the above table the principal results of the chapter thus far, I have said all that need be said of the constituents of the phenomenal self, and of the nature of self-regard. Our decks are consequently cleared for the struggle with that pure principle of personal identity which has met us all along our preliminary exposition, but which we have always shied from and treated as a difficulty to be postponed. Ever since Hume's time, it has been justly regarded as the most puzzling puzzle with which psychology has to deal; and whatever view one may espouse, one has to hold his position against heavy odds. If, with the Spiritualists, one contend for a substantial soul, or transcendental principle of unity, one can give no positive account of what that may be. And if, with the Humians, one deny such a principle and say that the stream of passing thoughts is all, one runs against the entire common-sense of mankind, of which the belief in a distinct principle of selfhood seems an integral part. Whatever solution be adopted in the pages to come, we may as well make up our minds in advance that it will fail to satisfy the majority of those to whom it is addressed. The best way of approaching the matter will be to take up first—

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The Sense of Personal Identity.

In the last chapter it was stated in as radical a way as possible that the thoughts which we actually know to exist do not fly about loose, but seem each to belong to some one thinker and not to another. Each thought, out of a multitude of other thoughts of which it may think, is able to distinguish those which belong to its own Ego from those which do not. The former have a warmth and intimacy about them of which the latter are completely devoid, being merely conceived, in a cold and foreign fashion, and not appearing as blood-relatives, bringing their greetings to us from out of the past.

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Now this consciousness of personal sameness may be treated either as a subjective phenomenon or as an objective deliverance, as a feeling, or as a truth. We may explain how one bit of thought can come to judge other bits to belong to the same Ego with itself; or we may criticise its judgment and decide how far it may tally with the nature of things.

As a mere subjective phenomenon the judgment presents no difficulty or mystery peculiar to itself. It belongs to the great class of judgments of sameness; and there is nothing more remarkable in making a judgment of sameness in the first person than in the second or the third. The intellectual operations seem essentially alike, whether I say 'I am the same,' or whether I say 'the pen is the same, as yesterday.' It is as easy to think this as to think the opposite and say 'neither I nor the pen is the same.'

This sort of *bringing of things together into the object of a single judgment* is of course essential to all thinking. The things are conjoined *in* the thought, whatever may be the relation in which they appear to the thought. The thinking them is *thinking* them together, even if only with the result of judging that they do not *belong* together. This sort of *subjective synthesis*, essential to knowledge as such (whenever it has a complex object), must not be confounded with *objective synthesis* or union instead of difference or disconnection, known among the things.^[272] The subjective synthesis thesis is involved in thought's mere existence. Even a really disconnected world could only be *known* to be such by having its parts temporarily united in the Object of some pulse of consciousness.^[273]

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The sense of personal identity is not, then, this mere synthetic form essential to all thought. It is the sense of a sameness perceived *by* thought and predicated of things *thought-about*. These things are a present self and a self of yesterday. The thought not only thinks them both, but thinks that they are identical. The psychologist, looking on and playing the critic, might prove the thought wrong, and show there was no real identity,—there might have been no yesterday, or, at any rate, no self of yesterday; or, if there were, the sameness predicated might not obtain, or might be predicated on insufficient grounds. In either case the personal identity would not exist as a *fact*; but it would exist as a *feeling* all the same; the consciousness of it by the thought would be there, and the psychologist would still have to analyze that, and show where its illusoriness lay. Let us now be the psychologist and see whether it be right or wrong when it says, *I am the same self that I was yesterday*.

We may immediately call it right and intelligible so far as it posits a past time with past thoughts or selves contained therein—these were data which we assumed at the outset of the book. Right also and intelligible so far as it thinks of a present self—that present self we have just studied in its various forms. The only question for us is as to what the consciousness may mean when it calls the present self the *same* with one of the past selves which it has in mind.

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We spoke a moment since of warmth and intimacy. This leads us to the answer sought. For, whatever the thought we are criticising may think about its present self, that self comes to its acquaintance, or is actually felt, with warmth and intimacy. Of course this is the case with the *bodily* part of it; we feel the whole cubic mass of our body all the while, it gives us an unceasing sense of personal existence. Equally do we feel the inner 'nucleus of the spiritual

self,' either in the shape of yon faint physiological adjustments, or (adopting the universal psychological belief), in that of the pure activity of our thought taking place as such. Our remoter spiritual, material, and social selves, so far as they are realized, come also with a glow and a warmth; for the thought of them infallibly brings some degree of organic emotion in the shape of quickened heart-beats, oppressed breathing, or some other alteration, even though it be a slight one, in the general bodily tone. The character of 'warmth,' then, in the present self, reduces itself to either of two things,—something in the feeling which we have of the thought itself, as thinking, or else the feeling of the body's actual existence at the moment,—or finally to both. We cannot realize our present self without simultaneously feeling one or other of these two things. Any other fact which brings these two things with it into consciousness will be thought with a warmth and an intimacy like those which cling to the present self.

Any *distant* self which fulfils this condition will be thought with such warmth and intimacy. But which distant selves *do* fulfil the condition, when represented?

Obviously those, and only those, which fulfilled it when they were alive. *Them* we shall imagine with the animal warmth upon them, to them may possibly cling the aroma, the echo of the thinking taken in the act. And by a natural consequence, we shall assimilate them to each other and to the warm and intimate self we now feel within us as we think, and separate them as a collection from whatever selves have not this mark, much as out of a herd of cattle let loose for the winter on some wide western prairie the owner picks out and sorts together when the time for the round-up comes in the spring, all the beasts on which he finds his own particular brand.

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The various members of the collection thus set apart are felt to belong with each other whenever they are thought at all. The animal warmth, etc., is their herd-mark, the brand from which they can never more escape. It runs through them all like a thread through a chaplet and makes them into a whole, which we treat as a unit, no matter how much in other ways the parts may differ *inter se*. Add to this character the farther one that the distant selves appear to our thought as having for hours of time been *continuous* with each other, and the most recent ones of them continuous with the Self of the present moment, melting into it by slow degrees; and we get a still stronger bond of union. As we think we see an identical bodily thing when, in spite of changes of structure, it exists continuously before our eyes, or when, however interrupted its presence, its quality returns unchanged; so here we think we experience an identical *Self* when it appears to us in an analogous way. Continuity makes us unite what dissimilarity might otherwise separate; similarity makes us unite what discontinuity might hold apart. And thus it is, finally, that Peter, awakening in the same bed with Paul, and recalling what both had in mind before they went to sleep, reidentifies and appropriates the 'warm' ideas as his, and is never tempted to confuse them with those cold and pale-appearing ones which he ascribes to Paul. As well might he confound Paul's body, which he only sees, with his own body, which he sees but also feels. Each of us when he awakens says, Here's the same old self again, just as he says, Here's the same old bed, the same old room, the same old world.

The sense of our own personal identity, then, is exactly like any one of our other perceptions of sameness among phenomena. It is a conclusion grounded either on the resemblance in a fundamental respect; or on the continuity before the mind, of the phenomena compared.

And it must not be taken to mean more than these grounds warrant, or treated as a sort of metaphysical or absolute Unity in which all differences are overwhelmed. The past and present selves compared are the same just so far as they *are* the same, and no farther. A uniform feeling of 'warmth,' of bodily existence (or an equally uniform feeling of pure psychic energy?) pervades them all; and this is what gives them a *generic* unity, and makes them the same in *kind*. But this generic unity coexists with generic differences just as real as the unity. And if from the one point of view they are one self, from others they are as truly not one but many selves. And similarly of the attribute of continuity; it gives its own kind of

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unity to the self—that of mere connectedness, or unbrokenness, a perfectly definite phenomenal thing—but it gives not a jot or tittle more. And this unbrokenness in the stream of selves, like the unbrokenness in an exhibition of 'dissolving views,' in no wise implies any farther unity or contradicts any amount of plurality in other respects.

And accordingly we find that, where the resemblance and the continuity are no longer felt, the sense of personal identity goes too. We hear from our parents various anecdotes about our infant years, but we do not appropriate them as we do our own memories. Those breaches of decorum awaken no blush, those bright sayings no self-complacency. That child is a foreign creature with which our present self is no more identified in feeling than it is with some stranger's living child to-day. Why? Partly because great time-gaps break up all these early years—we cannot ascend to them by continuous memories; and partly because no representation of how the child *felt* comes up with the stories. We know what he said and did; but no sentiment of his little body, of his emotions, of his psychic strivings as they felt to him, comes up to contribute an element of warmth and intimacy to the narrative we hear, and the main bond of union with our present self thus disappears. It is the same with certain of our dimly-recollected experiences. We hardly know whether to appropriate them or to disown them as fancies, or things read or heard and not lived through. Their animal heat has evaporated; the feelings that accompanied them are so lacking in the recall, or so different from those we now enjoy, that no judgment of identity can be decisively cast.

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Resemblance among the parts of a continuum of feelings (especially bodily feelings) experienced along with things widely different in all other regards, *thus constitutes the real and verifiable 'personal identity' which we feel.* There is no other identity than this in the 'stream' of subjective consciousness which we described in the last chapter. Its parts differ, but under all their differences they are knit in these two ways; and if either way of knitting disappears, the sense of unity departs. If a man wakes up some fine day unable to recall any of his past experiences, so that he has to learn his biography afresh, or if he only recalls the facts of it in a cold abstract way as things that he is sure once happened; or if, without this loss of memory, his bodily and spiritual habits all change during the night, each organ giving a different tone, and the act of thought becoming aware of itself in a different way; he *feels*, and he *says*, that he is a changed person. He disowns his former me, gives himself a new name, identifies his present life with nothing from out of the older time. Such cases are not rare in mental pathology; but, as we still have some reasoning to do, we had better give no concrete account of them until the end of the chapter.

This description of personal identity will be recognized by the instructed reader as the ordinary doctrine professed by the empirical school. Associationists in England and France, Herbartians in Germany, all describe the Self as an aggregate of which each part, as to its *being*, is a separate fact. So far so good, then; thus much is true whatever farther things may be true; and it is to the imperishable glory of Hume and Herbart and their successors to have taken so much of the meaning of personal identity out of the clouds and made of the Self an empirical and verifiable thing.

But in leaving the matter here, and saying that this sum of passing things is all, these writers have neglected certain more subtle aspects of the Unity of Consciousness, to which we next must turn.

Our recent simile of the herd of cattle will help us. It will be remembered that the beasts were brought together into one herd because their owner found on each of them his brand. The 'owner' symbolizes here that 'section' of consciousness, or pulse of thought, which we have all along represented as the vehicle of the judgment of identity; and the 'brand' symbolizes the characters of warmth and continuity, by reason of which the judgment is made. There is found a *self*-brand, just as there is found a herd-brand. Each brand, so far, is

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the mark, or cause of our knowing, that certain things belong-together. But if the brand is the *ratio cognoscendi* of the belonging, the belonging, in the case of the herd, is in turn the *ratio existendi* of the brand. No beast would be so branded unless he belonged to the owner of the herd. They are not his because they are branded; they are branded because they are his. So that it seems as if our description of the belonging-together of the various selves, as a belonging-together which is merely *represented*, in a later pulse of thought, had knocked the bottom out of the matter, and omitted the most characteristic one of all the features found in the herd—a feature which common-sense finds in the phenomenon of personal identity as well, and for our omission of which she will hold us to a strict account. For common-sense insists that the unity of all the selves is not a mere appearance of similarity or continuity, ascertained after the fact. She is sure that it involves a real belonging to a real Owner, to a pure spiritual entity of some kind. Relation to this entity is what makes the self's constituents stick together as they do for thought. The individual beasts do not stick together, for all that they wear the same brand. Each wanders with whatever accidental mates it finds. The herd's unity is only potential, its centre ideal, like the 'centre of gravity' in physics, until the herdsman or owner comes. He furnishes a real centre of accretion to which the beasts are driven and by which they are held. The beasts stick together by sticking severally to him. Just so, common-sense insists, there must be a real proprietor in the case of the selves, or else their actual accretion into a 'personal consciousness' would never have taken place. To the usual empiricist explanation of personal consciousness this is a formidable reproof, because all the individual thoughts and feelings which have succeeded each other 'up to date' are represented by ordinary Associationism as in some inscrutable way 'integrating' or gumming themselves together on their own account, and thus fusing into a stream. All the incomprehensibilities which in [Chapter VI](#) we saw to attach to the idea of things fusing without a *medium* apply to the empiricist description of personal identity.

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But in our own account the medium is fully assigned, the herdsman is there, in the shape of something not among the things collected, but superior to them all, namely, the real, present onlooking, remembering, 'judging thought' or identifying 'section' of the stream. This is what collects,—'owns' some of the past facts which it surveys, and disowns the rest,—and so makes a unity that is actualized and anchored and does not merely float in the blue air of possibility. And the reality of such pulses of thought, with their function of knowing, it will be remembered that we did not seek to deduce or explain, but simply assumed them as the ultimate kind of fact that the psychologist must admit to exist.

But this assumption, though it yields much, still does not yield all that common-sense demands. The unity into which the Thought—as I shall for a time proceed to call, with a capital T, the present mental state—binds the individual past facts with each other and with itself, does not exist until the Thought is there. It is as if wild cattle were lassoed by a newly-created settler and then owned for the first time. But the essence of the matter to common-sense is that the past thoughts never were wild cattle, they were always owned. The Thought does not capture them, but as soon as it comes into existence it finds them already its own. How is this possible unless the Thought have a *substantial* identity with a former owner,—not a mere continuity or a resemblance, as in our account, but a *real unity*? Common-sense in fact would drive us to admit what we may for the moment call an Arch-Ego, dominating the entire stream of thought and all the selves that may be represented in it, as the ever self-same and changeless principle implied in their union. The 'Soul' of Metaphysics and the 'Transcendental Ego' of the Kantian Philosophy, are, as we shall soon see, but attempts to satisfy this urgent demand of common-sense. But, for a time at least, we can still express without any such hypotheses that appearance of never-lapsing ownership for which common-sense contends.

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For how would it be if the Thought, the present judging Thought, instead of being in any way substantially or transcendently identical with the former owner of the past self, merely inherited his 'title,' and thus stood as his legal representative now? It would then, if its birth coincided exactly with the death of another owner, *find* the past self already its own

as soon as it found it at all, and the past self would thus never be wild, but always owned, by a title that never lapsed. We can imagine a long succession of herdsmen coming rapidly into possession of the same cattle by transmission of an original title by bequest. May not the 'title' of a collective self be passed from one Thought to another in some analogous way?

It is a patent fact of consciousness that a transmission like this actually occurs. Each pulse of cognitive consciousness, each Thought, dies away and is replaced by another. The other, among the things it knows, knows its own predecessor, and finding it 'warm,' in the way we have described, greets it, saying: "Thou art *mine*, and part of the same self with me." Each later Thought, knowing and including thus the Thoughts which went before, is the final receptacle—and appropriating them is the final owner—of all that they contain and own. Each Thought is thus born an owner, and dies owned, transmitting whatever it realized as its Self to its own later proprietor. As Kant says, it is as if elastic balls were to have not only motion but knowledge of it, and a first ball were to transmit both its motion and its consciousness to a second, which took both up into *its* consciousness and passed them to a third, until the last ball held all that the other balls had held, and realized it as its own. It is this trick which the nascent thought has of immediately taking up the expiring thought and 'adopting' it, which is the foundation of the appropriation of most of the remoter constituents of the self. Who owns the last self owns the self before the last, for what possesses the possessor possesses the possessed.

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It is impossible to discover any *verifiable* features in personal identity, which this sketch does not contain, impossible to imagine how any transcendent non-phenomenal sort of an Arch-Ego, were he there, could shape matters to any other result, or be known in time by any other fruit, than just this production of a stream of consciousness each 'section' of which should know, and knowing, hug to itself and adopt, all those that went before,—thus standing as the *representative* of the entire past stream; and which should similarly adopt the objects already adopted by any portion of this spiritual stream. Such standing-as-representative, and such adopting, are perfectly clear phenomenal relations. The Thought which, whilst it knows another Thought and the Object of that Other, appropriates the Other and the Object which the Other appropriated, is still a perfectly distinct phenomenon from that Other; it may hardly resemble it; it may be far removed from it in space and time.

The only point that is obscure is the *act of appropriation* itself. Already in enumerating the constituents of the self and their rivalry, I had to use the word appropriate. And the quick-witted reader probably noticed at the time, in hearing how one constituent was let drop and disowned and another one held fast to and espoused, that the phrase was meaningless unless the constituents were objects in the hands of something else. A thing cannot appropriate itself; it *is* itself; and still less can it disown itself. There must be an agent of the appropriating and disowning; but that agent we have already named. It is the Thought to whom the various 'constituents' are known. That Thought is a vehicle of choice as well as of cognition; and among the choices it makes are these appropriations, or repudiations, of its 'own.' But the Thought never is an object in its own hands, it never appropriates or disowns itself. It appropriates *to* itself, it is the actual focus of accretion, the hook from which the chain of past selves dangles, planted firmly in the Present, which alone passes for real, and thus keeping the chain from being a purely ideal thing. Anon the hook itself will drop into the past with all it carries, and then be treated as an object and appropriated by a new Thought in the new present which will serve as living hook in turn. The present moment of consciousness is thus, as Mr. Hodgson says, the darkest in the whole series. It may feel its own immediate existence—we have all along admitted the possibility of this, hard as it is by direct introspection to ascertain the fact—but nothing can be known *about* it till it be dead and gone. Its appropriations are therefore less to *itself* than to the most intimately felt *part of*

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its present Object, the body, and the central adjustments, which accompany the act of thinking, in the head. *These are the real nucleus of our personal identity*, and it is their actual existence, realized as a solid present fact, which makes us say 'as sure as I exist, those past facts were part of myself.' They are the kernel to which the *represented* parts of the Self are assimilated, accreted, and knit on; and even were Thought entirely unconscious of itself in the act of thinking, these 'warm' parts of its present object would be a firm basis on which the consciousness of personal identity would rest.^[274] Such consciousness, then, as a psychologic fact, can be fully described without supposing any other agent than a succession of perishing thoughts, endowed with the functions of appropriation and rejection, and of which some can know and appropriate or reject objects already known, appropriated, or rejected by the rest.

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FIG. 34.

To illustrate by diagram, let A, B, and C stand for three successive thoughts, each with its object inside of it. If B's object be A, and C's object be B; then A, B, and C would stand for three pulses in a consciousness of personal identity. Each pulse would *be* something different from the others; but B would know and adopt A, and C would know and adopt A and B. Three successive states of the same brain, on which each experience in passing leaves its mark, might very well engender thoughts differing from each other in just such a way as this.

The passing Thought then seems to be the Thinker; and though there *may* be another non-phenomenal Thinker behind that, so far we do not seem to need him to express the facts. But we cannot definitively make up our mind about him until we have heard the reasons that have historically been used to prove his reality.

THE PURE SELF OR INNER PRINCIPLE OF PERSONAL UNITY.

To a brief survey of the theories of the Ego let us then next proceed. They are three in number, as follows:

- 1) The Spiritualist theory;
- 2) The Associationist theory;
- 3) The Transcendentalist theory.

The Theory of the Soul.

In [Chapter VI](#) we were led ourselves to the spiritualist theory of the 'Soul,' as a means of escape from the unintelligibilities of mind-stuff 'integrating' with itself, and from the physiological improbability of a material monad, with thought attached to it, in the brain. But at the end of the chapter we said we should examine the 'Soul' critically in a later place, to see whether it had any other advantages as a theory over the simple phenomenal notion of a stream of thought accompanying a stream of cerebral activity, by a law yet unexplained.

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The theory of the Soul is the theory of popular philosophy and of scholasticism, which is only popular philosophy made systematic. It declares that the principle of individuality within us must be *substantial*, for psychic phenomena are activities, and there can be no

activity without a concrete agent. This substantial agent cannot be the brain but must be something *immaterial*; for its activity, thought, is both immaterial, and takes cognizance of immaterial things, and of material things in general and intelligible, as well as in particular and sensible ways,—all which powers are incompatible with the nature of matter, of which the brain is composed. Thought moreover is simple, whilst the activities of the brain are compounded of the elementary activities of each of its parts. Furthermore, thought is spontaneous or free, whilst all material activity is determined *ab extra*; and the will can turn itself against all corporeal goods and appetites, which would be impossible were it a corporeal function. For these objective reasons the principle of psychic life must be both immaterial and simple as well as substantial, must be what is called *a Soul*. The same consequence follows from subjective reasons. Our consciousness of personal identity assures us of our essential simplicity: the owner of the various constituents of the self, as we have seen them, the hypothetical Arch-Ego whom we provisionally conceived as possible, is a real entity of whose existence self-consciousness makes us directly aware. No material agent could thus turn round and grasp *itself*—material activities always grasp something else than the agent. And if a brain *could* grasp itself and be self-conscious, it would be conscious of itself *as* a brain and not as something of an altogether different kind. The Soul then exists as a simple spiritual substance in which the various psychic faculties, operations, and affections inhere.

If we ask what a Substance is, the only answer is that it is a self-existent being, or one which needs no other subject in which to inhere. At bottom its only positive determination is Being, and this is something whose meaning we all realize even though we find it hard to explain. The Soul is moreover an *individual* being, and if we ask what that is, we are told to look in upon our Self, and we shall learn by direct intuition better than through any abstract reply. Our direct perception of our own inward being is in fact by many deemed to be the original prototype out of which our notion of simple active substance in general is fashioned. The *consequences* of the simplicity and substantiality of the Soul are its incorruptibility and natural *immortality*—nothing but God's direct *fiat* can annihilate it—and its *responsibility* at all times for whatever it may have ever done. [Pg 344]

This substantialist view of the soul was essentially the view of Plato and of Aristotle. It received its completely formal elaboration in the middle ages. It was believed in by Hobbes, Descartes, Locke, Leibnitz, Wolf, Berkeley, and is now defended by the entire modern dualistic or spiritualistic or common-sense school. Kant held to it while denying its fruitfulness as a premise for deducing consequences verifiable here below. Kant's successors, the absolute idealists, profess to have discarded it,—how that may be we shall inquire ere long. Let us make up our minds what to think of it ourselves.

It is at all events needless for expressing the actual subjective phenomena of consciousness as they appear. We have formulated them all without its aid, by the supposition of a stream of thoughts, each substantially different from the rest, but cognitive of the rest and 'appropriative' of each other's content. At least, if I have not already succeeded in making this plausible to the reader, I am hopeless of convincing him by anything I could add now. The unity, the identity, the individuality, and the immateriality that appear in the psychic life are thus accounted for as phenomenal and temporal facts exclusively, and with no need of reference to any more simple or substantial agent than the present Thought or 'section' of the stream. We have seen it to be single and unique in the sense of having no *separable* parts (above, [p. 239](#) ff.)—perhaps that is the only kind of simplicity meant to be predicated of the soul. The present Thought also has being,—at least all believers in the Soul believe so—and if there be no other Being in which it 'inheres,' it ought itself to be a 'substance.' If *this* kind of simplicity and substantiality were all that is predicated of the Soul, then it might appear that we had been talking of the soul all along, without knowing it, when we treated the present Thought as an agent, an owner, and the like. But the Thought is a perishing and not an immortal or incorruptible thing. Its successors may continuously succeed to it, resemble it, and appropriate it, but they *are* not it, whereas the Soul-Substance is supposed to be a [Pg 345]

fixed unchanging thing. By the Soul is always meant something *behind* the present Thought, another kind of substance, existing on a non-phenomenal plane.

When we brought in the Soul at the end of [Chapter VI](#), as an entity which the various brain-processes were supposed to affect simultaneously, and which responded to their combined influence by single pulses of its thought, it was to escape integrated mind-stuff on the one hand, and an improbable cerebral monad on the other. But when (as now, after all we have been through since that earlier passage) we take the two formulations, first of a brain to whose processes pulses of thought *simply* correspond, and second, of one to whose processes pulses of thought *in a Soul* correspond, and compare them together, we see that at bottom the second formulation is only a more roundabout way than the first, of expressing the same bald fact. That bald fact is that *when the brain acts, a thought occurs*. The spiritualistic formulation says that the brain-processes knock the thought, so to speak, out of a Soul which stands there to receive their influence. The simpler formulation says that the thought simply *comes*. But what positive meaning has the Soul, when scrutinized, but the *ground of possibility* of the thought? And what is the 'knocking' but the *determining of the possibility to actuality*? And what is this after all but giving a sort of concentered form to one's belief that the coming of the thought, when the brain-processes occur, has *some* sort of ground in the nature of things? If the world Soul be understood merely to express that claim, it is a good word to use. But if it be held to do more, to gratify the claim,—for instance, to connect rationally the thought which comes, with the processes which occur, and to mediate intelligibly between their two disparate natures,—then it is an illusory term. It is, in fact, with the word Soul as with the word Substance in general. To say that phenomena inhere in a Substance is at bottom only to record one's protest against the notion that the bare existence of the phenomena is the total truth. A phenomenon would not itself be, we insist, unless there were something *more* than the phenomenon. To the more we give the provisional name of Substance. So, in the present instance, we ought certainly to admit that there is more than the bare fact of coexistence of a passing thought with a passing brain-state. But we do not answer the question 'What is that more?' when we say that it is a 'Soul' which the brain-state affects. This kind of more *explains* nothing; and when we are once trying metaphysical explanations we are foolish not to go as far as we can. For my own part I confess that the moment I become metaphysical and try to define the more, I find the notion of some sort of an *anima mundi* thinking in all of us to be a more promising hypothesis, in spite of all its difficulties, than that of a lot of absolutely individual souls. Meanwhile, as *psychologists*, we need not be metaphysical at all. The phenomena are enough, the passing Thought itself is the only *verifiable* thinker, and its empirical connection with the brain-process is the ultimate known law.

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To the other arguments which would prove the need of a soul, we may also turn a deaf ear. The argument from free-will can convince only those who believe in free-will; and even they will have to admit that spontaneity is just as possible, to say the least, in a temporary spiritual agent like our 'Thought' as in a permanent one like the supposed Soul. The same is true of the argument from the kinds of things cognized. Even if the brain could not cognize universal, immaterials, or its 'Self,' still the 'Thought' which we have relied upon in our account *is* not the brain, closely as it seems connected with it; and after all, if the brain could cognize at all, one does not well see why it might not cognize one sort of thing as well as another. The great difficulty is in seeing how a thing can cognize *anything*. This difficulty is not in the least removed by giving to the thing that cognizes the name of Soul. The Spiritualists do not deduce any of the properties of the mental life from otherwise known properties of the soul. They simply find various characters ready-made in the mental life, and these they clap into the Soul, saying, "Lo! behold the source from whence they flow!" The merely verbal character of this 'explanation' is obvious. The Soul invoked, far from making the phenomena more intelligible, can only be made intelligible itself by borrowing their form,—it must be represented, if at all, as a transcendent stream of consciousness duplicating the one we know.

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Altogether, the Soul is an outbirth of that sort of philosophizing whose great maxim, according to Dr. Hodgson, is: "Whatever you are *totally* ignorant of, assert to be the explanation of everything else."

Locke and Kant, whilst still believing in the soul, began the work of undermining the notion that we know anything about it. Most modern writers of the mitigated spiritualistic, or dualistic philosophy—the Scotch school, as it is often called among us—are forward to proclaim this ignorance, and to attend exclusively to the verifiable phenomena of self-consciousness, as we have laid them down. Dr. Wayland, for example, begins his Elements of Intellectual Philosophy with the phrase "Of the essence of Mind we know nothing," and goes on: "All that we are able to affirm of it is that it is *something* which perceives, reflects, remembers, imagines, and wills; but what that something *is* which exerts these energies we know not. It is only as we are conscious of the action of these energies that we are conscious of the existence of mind. It is only by the exertion of its own powers that the mind becomes cognizant of their existence. The cognizance of its powers, however, gives us no knowledge of that essence of which they are predicated. In these respects our knowledge of mind is precisely analogous to our knowledge of matter." This analogy of our two ignorances is a favorite remark in the Scotch school. It is but a step to lump them together into a single ignorance, that of the 'Unknowable' to which any one fond of superfluities in philosophy may accord the hospitality of his belief, if it so please him, but which any one else may as freely ignore and reject. [Pg 348]

The Soul-theory is, then, a complete superfluity, so far as accounting for the actually verified facts of conscious experience goes. So far, no one can be compelled to subscribe to it for definite scientific reasons. The case would rest here, and the reader be left free to make his choice, were it not for other demands of a more practical kind.

The first of these is *Immortality*, for which the simplicity and substantiality of the Soul seem to offer a solid guarantee. A 'stream' of thought, for aught that we see to be contained in its essence, may come to a full stop at any moment; but a simple substance is incorruptible, and will, by its own inertia, persist in Being so long as the Creator does not by a direct miracle snuff it out. Unquestionably this is the stronghold of the spiritualistic belief,—as indeed the popular touchstone for all philosophies is the question, "What is their bearing on a future life?"

The Soul, however, when closely scrutinized, guarantees no immortality of a sort *we care for*. The enjoyment of the atom-like simplicity of their substance *in sæcula sæculorum* would not to most people seem a consummation devoutly to be wished. The substance must give rise to a stream of consciousness continuous with the present stream, in order to arouse our hope, but of this the mere persistence of the substance *per se* offers no guarantee. Moreover, in the general advance of our moral ideas, there has come to be something ridiculous in the way our forefathers had of grounding their hopes of immortality on the simplicity of their substance. The demand for immortality is nowadays essentially teleological. We believe ourselves immortal because we believe ourselves *fit* for immortality. A 'substance' ought surely to perish, we think, if not worthy to survive; and an insubstantial 'stream' to prolong itself, provided it be worthy, if the nature of Things is organized in the rational way in which we trust it is. Substance or no substance, soul or 'stream,' what Lotze says of immortality is about all that human wisdom can say: [Pg 349]

"We have no other principle for deciding it than this general idealistic belief: that every created thing will continue whose continuance belongs to the meaning of the world, and so long as it does so belong; whilst every one will pass away whose reality is justified only in a transitory phase of the world's

course. That this principle admits of no further application in human hands need hardly be said. *We* surely know not the merits which may give to one being a claim on eternity, nor the defects which would cut others off."^[275]

A second alleged necessity for a soul-substance is our forensic responsibility before God. Locke caused an uproar when he said that the unity of *consciousness* made a man the same *person*, whether supported by the same *substance* or no, and that God would not, in the great day, make a person answer for what he remembered nothing of. It was supposed scandalous that our forgetfulness might thus deprive God of the chance of certain retributions, which otherwise would have enhanced his 'glory.' This is certainly a good speculative ground for retaining the Soul—at least for those who demand a plenitude of retribution. The mere stream of consciousness, with its lapses of memory, cannot possibly be as 'responsible' as a soul which *is* at the judgment day all that it ever was. To modern readers, however, who are less insatiate for retribution than their grandfathers, this argument will hardly be as convincing as it seems once to have been.

One great use of the Soul has always been to account for, and at the same time to guarantee, the closed individuality of each personal consciousness. The thoughts of one soul must unite into one self, it was supposed, and must be eternally insulated from those of every other soul. But we have already begun to see that, although unity is the rule of each man's consciousness, yet in some individuals, at least, thoughts may split away from the others and form separate selves. As for insulation, it would be rash, in view of the phenomena of thought-transference, mesmeric influence and spirit-control, which are being alleged nowadays on better authority than ever before, to be too sure about that point either. The definitively closed nature of our personal consciousness is probably an average statistical resultant of many conditions, but not an elementary force or fact; so that, if one wishes to preserve the Soul, the less he draws his arguments from *that* quarter the better. So long as our self, on the whole, makes itself good and practically maintains itself as a closed individual, why, as Lotze says, is not that enough? And why is the *being-an-individual* in some inaccessible metaphysical way so much prouder an achievement?^[276]

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My final conclusion, then, about the substantial Soul is that it explains nothing and guarantees nothing. Its successive thoughts are the only intelligible and verifiable things about it, and definitely to ascertain the correlations of these with brain-processes is as much as psychology can empirically do. From the metaphysical point of view, it is true that one may claim that the correlations have a rational ground; and if the word Soul could be taken to mean merely some such vague problematic ground, it would be unobjectionable. But the trouble is that it professes to give the ground in positive terms of a very dubiously credible sort. I therefore feel entirely free to discard the word Soul from the rest of this book. If I ever use it, it will be in the vaguest and most popular way. The reader who finds any comfort in the idea of the Soul, is, however, perfectly free to continue to believe in it; for our reasonings have not established the non-existence of the Soul; they have only proved its superfluity for scientific purposes.

The next theory of the pure Self to which we pass is

The Associationist Theory.

Locke paved the way for it by the hypothesis he suggested of the same substance having two successive consciousnesses, or of the same consciousness being supported by more than one substance. He made his readers feel that the *important* unity of the Self was its verifiable

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and felt unity, and that a metaphysical or absolute unity would be insignificant, so long as a *consciousness* of diversity might be there.

Hume showed how great the consciousness of diversity actually was. In the famous chapter on Personal Identity, in his Treatise on Human Nature, he writes as follows:

"There are some philosophers who imagine we are every moment intimately conscious of what we call our SELF; that we feel its existence and its continuance in existence, and are certain, beyond the evidence of a demonstration, both of its perfect identity and simplicity.... Unluckily all these positive assertions are contrary to that very experience which is pleaded for them, nor have we any idea of Self, after the manner it is here explained.... It must be some one impression that gives rise to every real idea.... If any impression gives rise to the idea of Self, that impression must continue invariably the same through the whole course of our lives, since self is supposed to exist after that manner. But there is no impression constant and invariable. Pain and pleasure, grief and joy, passions and sensations succeed each other, and never all exist at the same time.... For my part, when I enter most intimately into what I call *myself*, I always stumble on some particular perception or other of heat or cold, light or shade, love or hatred, pain or pleasure. I never can catch *myself* at any time without a perception, and never can observe anything but the perception. When my perceptions are removed for any time, as by sound sleep, so long am I insensible of *myself* and may truly be said not to exist. And were all my perceptions removed by death, and could I neither think, nor feel, nor see, nor love, nor hate after the dissolution of my body, I should be entirely annihilated, nor do I conceive what is farther requisite to make me a perfect non-entity. If anyone, upon serious and unprejudiced reflection, thinks he has a different notion of *himself* I must confess I can reason no longer with him. All I can allow him is, that he may be in the right as well as I, and that we are essentially different in this particular. He may, perhaps, perceive something simple and continued which he calls *himself*; though I am certain there is no such principle in me.

"But setting aside some metaphysicians of this kind, I may venture to affirm of the rest of mankind that they are *nothing but a bundle or collection of different perceptions*, which succeed each other with an inconceivable rapidity, and are in a perpetual flux and movement. Our eyes cannot turn in their sockets without varying our perceptions. Our thought is still more variable than our sight; and all our other senses and faculties contribute to this change; nor is there any single power of the soul which remains unalterably the same, perhaps for one moment. The mind is a kind of theatre, where several perceptions successively make their appearance; pass, repass, glide away and mingle in an infinite variety of postures and situations. *There is properly no simplicity in it at one time, nor identity in different*; whatever natural propension we may have to imagine that simplicity and identity. The comparison of the theatre must not mislead us. They are the successive perceptions only, that constitute the mind; nor have we the most distant notion of the place where these scenes are represented, nor of the material of which it is composed."

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But Hume, after doing this good piece of introspective work, proceeds to pour out the child with the bath, and to fly to as great an extreme as the substantialist philosophers. As they say the Self is nothing but Unity, unity abstract and absolute, so Hume says it is nothing but Diversity, diversity abstract and absolute; whereas in truth it is that mixture of unity and diversity which we ourselves have already found so easy to pick apart. We found among the objects of the stream certain feelings that hardly changed, that stood out warm and vivid in

the past just as the present feeling does now; and we found the present feeling to be the centre of accretion to which, *de proche en proche*, these other feelings are, *by the judging Thought*, felt to cling. Hume says nothing of the judging Thought; and he denies this thread of resemblance, this core of sameness running through the ingredients of the Self, to exist even as a phenomenal thing. To him there is no *tertium quid* between pure unity and pure separateness. A succession of ideas "connected by a close relation affords to an accurate view as perfect a notion of diversity as if there was *no manner of relation*" *at all*.

"All our distinct perceptions are distinct existences, and the mind never perceives any real connection among distinct existences. Did our perceptions either inhere in something simple or individual, or *did the mind perceive some real connection* among them, there would be no difficulty in the case. For my part, I must plead the privilege of a sceptic and confess that this difficulty is too hard for my understanding, I pretend not, however, to pronounce it insuperable. Others, perhaps,... may discover some hypothesis that will reconcile these contradictions."^[277]

Hume is at bottom as much of a metaphysician as Thomas Aquinas. No wonder he can discover no 'hypothesis.' The unity of the parts of the stream is just as 'real' a connection as their diversity is a real separation; both connection and separation are ways in which the past thoughts appear to the present Thought;—unlike each other in respect of date and certain qualities—this is the separation; alike in other qualities, and continuous in time—this is the connection. In demanding a more 'real' connection than this obvious and verifiable likeness and continuity, Hume seeks 'the world behind the looking glass,' and gives a striking example of that Absolutism which is the great disease of philosophic Thought.

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The chain of distinct existences into which Hume thus chopped up our 'stream' was adopted by all of his successors as a complete inventory of the facts. The associationist Philosophy was founded. Somehow, out of 'ideas,' each separate, each ignorant of its mates, but sticking together and calling each other up according to certain laws, all the higher forms of consciousness were to be explained, and among them the consciousness of our personal identity. The task was a hard one, in which what we called the psychologist's fallacy (p. 196 ff.) bore the brunt of the work. Two ideas, one of 'A,' succeeded by another of 'B,' were transmuted into a third idea of '*B after A*.' An idea from last year returning now was taken to be an idea *of last year*; two similar ideas stood for an *idea of similarity*, and the like; palpable confusions, in which certain facts *about* the ideas, possible only to an outside knower of them, were put into the place of the ideas' own proper and limited deliverance and content. Out of such recurrences and resemblances in a series of discrete ideas and feelings a knowledge was somehow supposed to be engendered in each feeling that it *was* recurrent and resembling, and that it helped to form a series to whose unity the name *I* came to be joined. In the same way, substantially, Herbart,^[278] in Germany, tried to show how a conflict of ideas would fuse into a *manner of representing itself* for which *I* was the consecrated name.^[279]

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The defect of all these attempts is that the conclusion pretended to follow from certain premises is by no means rationally involved in the premises. A feeling of any kind, if it simply *returns*, ought to be nothing else than what it was at first. If memory of previous existence and all sorts of other cognitive functions are attributed to it when it returns, it is no longer the same, but a widely different feeling, and ought to be so described. *We* have so described it with the greatest explicitness. We have said that feelings never do return. We have not pretended to *explain* this; we have recorded it as an empirically ascertained law,

analogous to certain laws of brain-physiology; and, seeking to define the way in which new feelings do differ from the old, we have found them to be *cognizant* and *appropriative* of the old, whereas the old were always cognizant and appropriative of something else. Once more, this account pretended to be nothing more than a complete description of the facts. It explained them no more than the associationist account explains them. But the latter both assumes to explain them and in the same breath falsifies them, and for each reason stands condemned.

It is but just to say that the associationist writers as a rule seem to have a lurking bad conscience about the Self; and that although they are explicit enough about what it is, namely, a train of feelings or thoughts, they are very shy about openly tackling the problem of how it comes to be aware of itself. Neither Bain nor Spencer, for example, directly touch this problem. As a rule, associationist writers keep talking about 'the mind' and about what 'we' do; and so, smuggling in surreptitiously what they ought avowedly to have postulated in the form of a present 'judging Thought,' they either trade upon their reader's lack of discernment or are undiscerning themselves.

Mr. D. G. Thompson is the only associationist writer I know who perfectly escapes this confusion, and *postulates* openly what he needs. "All states of consciousness," he says, "imply and postulate a subject Ego, whose substance is unknown and unknowable, to which [why not say *by* which?] states of consciousness are referred as attributes, but which in the process of reference becomes objectified and becomes itself an attribute of a subject Ego which lies still beyond, and which ever eludes cognition though ever postulated for cognition."^[280] This is exactly our judging and remembering present 'Thought,' described in less simple terms.

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After Mr. Thompson, M. Taine and the two Mills deserve credit for seeking to be as clear as they can. Taine tells us in the first volume of his 'Intelligence' what the Ego *is*,—a continuous web of conscious events no more really distinct from each other^[281] than rhomboids, triangles, and squares marked with chalk on a plank are really distinct, for the plank itself is one. In the second volume he *says* all these parts have a common character embedded in them, that of being *internal* [this is our character of 'warmness,' otherwise named]. This character is abstracted and isolated by a mental fiction, and is what we are *conscious of* as our self—'this stable *within* is what each of us calls *I* or *me*.' Obviously M. Taine forgets to tell us what this 'each of us' is, which suddenly starts up and performs the abstraction and 'calls' its product *I* or *me*. The character does not abstract *itself*. Taine means by 'each of us' merely the present 'judging Thought' with its memory and tendency to appropriate, but he does not name it distinctly enough, and lapses into the fiction that the entire series of thoughts, the entire 'plank,' is the reflecting psychologist.

James Mill, after defining Memory as a train of associated ideas beginning with that of my past self and ending with that of my present self, defines my Self as a train of ideas of which Memory declares the first to be continuously connected with the last. The successive associated ideas 'run, as it were, into a single point of consciousness.'^[282] John Mill, annotating this account, says:

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"The phenomenon of Self and that of Memory are merely two sides of the same fact, or two different modes of viewing the same fact. We may, as psychologists, set out from either of them, and refer the other to it.... But it is hardly allowable to do both. At least it must be said that by doing so we explain neither. We only show that the two things are essentially the same; that my memory of having ascended Skiddaw on a given day, and my consciousness of being the same person who ascended Skiddaw on that day, are two modes of stating the same fact: a fact which psychology has as yet failed to resolve into anything more elementary. In analyzing the complex phenomena of consciousness, we must come to something ultimate; and we seem to have

reached two elements which have a good *prima facie* claim to that title. There is, first,... the difference between a fact and the Thought of that fact: a distinction which we are able to cognize in the past, and which then constitutes Memory, and in the future, when it constitutes Expectation; but in neither case can we give any account of it except that it exists.... Secondly, in addition to this, and setting out from the belief ... that the idea I now have was derived from a previous sensation ... there is the further conviction that this sensation ... was my own; that it happened to my self. In other words, I am aware of a long and uninterrupted succession of past feelings, going back as far as memory reaches, and terminating with the sensations I have at the present moment, all of which are connected by an inexplicable tie, that distinguishes them not only from any succession or combination in mere thought, but also from the parallel successions of feelings which I believe, on satisfactory evidence, to have happened to each of the other beings, shaped like myself, whom I perceive around me. This succession of feelings, which I call my memory of the past, is that by which I distinguish my Self. Myself is the person who had that series of feelings, and I know nothing of myself, by direct knowledge, except that I had them. But there is a bond of some sort among all the parts of the series, which makes me say that they were feelings of a person who was the same person throughout [according to us this is their 'warmth' and resemblance to the 'central spiritual self' now actually felt] and a different person from those who had any of the parallel successions of feelings; and this bond, to me, constitutes my Ego. Here I think the question must rest, until some psychologist succeeds better than anyone else has done, in showing a mode in which the analysis can be carried further."^[283]

The reader must judge of our own success in carrying the analysis farther. The various distinctions we have made are all parts of an endeavor so to do. John Mill himself, in a later-written passage, so far from advancing in the line of analysis, seems to fall back upon something perilously near to the Soul. He says: [Pg 357]

"The fact of recognizing a sensation,... remembering that it has been felt before, is the simplest and most elementary fact of memory: and the *inexplicable tie* ... which connects the present consciousness with the past one of which it reminds me, is as near as I think we can get to a positive conception of Self. That there is something real in this tie, real as the sensations themselves, and not a mere product of the laws of thought without any fact corresponding to it, I hold to be indubitable.... This original element,... to which we cannot give any name but its own peculiar one, without implying some false or ungrounded theory, is the Ego, or Self. As such I ascribe a reality to the Ego—to my own mind—different from that real existence as a Permanent Possibility, which is the only reality I acknowledge in Matter.... We are forced to apprehend every part of the series as linked with the other parts by *something in common* which is not the feelings themselves, any more than the succession of the feelings is the feelings themselves; and as that which is the same in the first as in the second, in the second as in the third, in the third as in the fourth, and so on, must be the same in the first and in the fiftieth, this common element is a permanent element. But beyond this we can affirm nothing of it except the states of consciousness themselves. The feelings or consciousnesses which belong or have belonged to it, and its possibilities of having more, are the only facts there are to be asserted of Self—the only positive attributes, except permanence, which we can ascribe to it."^[284]

Mr. Mill's habitual method of philosophizing was to affirm boldly some general doctrine derived from his father, and then make so many concessions of detail to its enemies as practically to abandon it altogether.^[285] In this place the concessions amount, so far as they are intelligible, to the admission of something very like the Soul. This 'inexplicable tie' which connects the feelings, this 'something in common' by which they are linked and which is not the passing feelings themselves, but something 'permanent,' of which we can 'affirm nothing' save its attributes and its permanence, what is it but metaphysical Substance come again to life? Much as one must respect the fairness of Mill's temper, quite as much must one regret his failure of acumen at this point. At bottom he makes the same blunder as Hume: the sensations *per se*, he thinks, have no 'tie.' The tie of resemblance and continuity which the remembering Thought finds among them is not a 'real tie' but 'a mere product of the laws of thought;' and the fact that the present Thought 'appropriates' them is also no real tie. But whereas Hume was contented to say that there might after all *be* no 'real tie,' Mill, unwilling to admit this possibility, is driven, like any scholastic, to place it in a non-phenomenal world.

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John Mill's concessions may be regarded as the *definitive bankruptcy of the associationist description* of the consciousness of self, starting, as it does, with the best intentions, and dimly conscious of the path, but 'perplexed in the extreme' at last with the inadequacy of those 'simple feelings,' non-cognitive, non-transcendent of themselves, which were the only baggage it was willing to take along. One must *beg* memory, knowledge on the part of the feelings of something outside themselves. That granted, every other true thing follows naturally, and it is hard to go astray. The knowledge the present feeling has of the past ones is a real tie between them, so is their resemblance; so is their continuity; so is the one's 'appropriation' of the other: all are real ties, realized in the judging Thought of every moment, the only place where *disconnections* could be realized, did they exist. Hume and Mill both imply that a disconnection can be realized there, whilst a tie cannot. But the ties and the disconnections are exactly on a par, in this matter of self-consciousness. The way in which the present Thought appropriates the past is a real way, so long as no other owner appropriates it in a more real way, and so long as the Thought has no grounds for repudiating it stronger than those which lead to its appropriation. But no other owner ever does in point of fact present himself for my past; and the grounds which I perceive for appropriating it—viz., continuity and resemblance with the present—outweigh those I perceive for disowning it—viz., distance in time. My present Thought stands thus in the plenitude of ownership of the train of my past selves, is owner not only *de facto*, but *de jure*, the most real owner there can be, and all without the supposition of any 'inexplicable tie,' but in a perfectly verifiable and phenomenal way.

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Turn we now to what we may call

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which owes its origin to Kant. Kant's own statements are too lengthy and obscure for verbatim quotation here, so I must give their substance only. Kant starts, as I understand him, from a view of the *Object* essentially like our own description of it on p. 275 ff., that is, it is a system of things, qualities or facts in relation. "*Object* is that in the knowledge (Begriff) of which the Manifold of a given Perception is connected."^[286] But whereas we simply begged the vehicle of this connected knowledge in the shape of what we call the present Thought, or section of the Stream of Consciousness (which we declared to be the ultimate fact for psychology), Kant denies this to be an ultimate fact and insists on analyzing it into a large number of distinct, though equally essential, elements. The 'Manifoldness' of the Object is due to Sensibility, which *per se* is chaotic, and the unity is due to the synthetic handling which this Manifold receives from the higher faculties of Intuition, Apprehension,

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Imagination, Understanding, and Apperception. It is the one essential spontaneity of the Understanding which, under these different names, brings unity into the manifold of sense.

"The Understanding *is*, in fact, nothing more than the faculty of binding together *a priori*, and of bringing the Manifold of given ideas under the unity of Apperception, which consequently is the supreme principle in all human knowledge" (§ 16).

The material connected must be *given* by lower faculties to the Understanding, for the latter is not an intuitive faculty, but by nature 'empty.' And the bringing of this material 'under the unity of Apperception' is explained by Kant to mean the thinking it always so that, whatever its other determinations be, it may be known as *thought by me*.^[287] Though this consciousness, that *I think it*, need not be at every moment explicitly realized, it is always *capable* of being realized. For if an object *incapable* of being combined with the idea of a thinker were there, how could it be known, how related to other objects, how form part of 'experience' at all?

The awareness that *I think* is therefore implied in all experience. No connected consciousness of anything without that of *Self* as its presupposition and 'transcendental' condition! All things, then, so far as they are intelligible at all, are so through combination with pure consciousness of *Self*, and apart from this, at least potential, combination nothing is knowable *to us* at all. [Pg 362]

But this self, whose consciousness Kant thus established deductively as a *conditio sine quâ non* of experience, is in the same breath denied by him to have any positive attributes. Although Kant's name for it—the 'original transcendental synthetic Unity of Apperception'—is so long, our consciousness *about* it is, according to him, short enough. Self-consciousness of this 'transcendental' sort tells us, 'not how we appear, not how we inwardly are, but only *that* we are' (§ 25). At the basis of our knowledge of our selves there lies only "the simple and utterly empty idea: *I*; of which we cannot even say we have a notion, but only a consciousness which accompanies all notions. In this *I*, or *he* or *it* (the thing) which thinks, nothing more is represented than the bare transcendental Subject of the knowledge = *x*, which is only recognized by the thoughts which are its predicates, and of which, taken by itself, we cannot form the least conception" (*ibid.* 'Paralogisms'). The pure Ego of all apperception is thus for Kant not the soul, but only that 'Subject' which is the necessary correlate of the Object in all knowledge. There *is* a soul, Kant thinks, but this mere ego-form of our consciousness tells us nothing about it, neither whether it be substantial, nor whether it be immaterial, nor whether it be simple, nor whether it be permanent. These declarations on Kant's part of the utter barrenness of the consciousness of the pure Self, and of the consequent impossibility of any deductive or 'rational' psychology, are what, more than anything else, earned for him the title of the 'all-destroyer.' The only self we know anything positive *about*, he thinks, is the empirical *me*, not the pure *I*; the self which is an object among other objects and the 'constituents' of which we ourselves have seen, and recognized to be phenomenal things appearing in the form of space as well as time.

This, for our purposes, is a sufficient account of the 'transcendental' Ego.

Those purposes go no farther than to ascertain whether anything in Kant's conception ought to make us give up our own, of a remembering and appropriating Thought incessantly renewed. In many respects Kant's meaning is obscure, but it will not be necessary for us to squeeze the texts in order to make sure what it actually and historically was. If we can define clearly two or three things which it may *possibly* have been, that will help us just as much to clear our own ideas. [Pg 363]

On the whole, a defensible interpretation of Kant's view would take somewhat the following shape. Like ourselves he believes in a Reality outside the mind of which he writes, but the

critic who vouches for that reality does so on grounds of faith, for it is not a verifiable phenomenal thing. Neither is it manifold. The 'Manifold' which the intellectual functions combine is a mental manifold altogether, which thus *stands between* the Ego of Apperception and the outer Reality, but still stands inside the mind. In the function of knowing there is a multiplicity to be connected, and Kant brings this multiplicity inside the mind. The Reality becomes a mere empty *locus*, or unknowable, the so-called Noumenon; the manifold phenomenon is in the mind. We, on the contrary, put the Multiplicity with the Reality outside, and leave the mind simple. Both of us deal with the same elements—thought and object—the only question is in which of them the multiplicity shall be lodged. Wherever it is lodged it must be 'synthetized' when it comes to be thought. And that particular way of lodging it will be the better, which, in addition to describing the facts naturally, makes the 'mystery of synthesis' least hard to understand.

Well, Kant's way of describing the facts is mythological. The notion of our thought being this sort of an elaborate internal machine-shop stands condemned by all we said in favor of its simplicity on [pages 276 ff.](#) Our Thought is not composed of parts, however so composed its objects may be. There is no originally chaotic manifold in it to be reduced to order. There is something almost shocking in the notion of so chaste a function carrying this Kantian hurly-burly in her womb. If we are to have a dualism of Thought and Reality at all, the multiplicity should be lodged in the latter and not in the former member of the couple of related terms. The parts and their relations surely belong less to the knower than to what is known.

But even were all the mythology true, the process of synthesis would in no whit be *explained* by calling the inside of the mind its seat. No mystery would be made lighter by such means. It is just as much a puzzle *how* the 'Ego' can employ the productive Imagination to make the Understanding use the categories to combine the data which Recognition, Association, and Apprehension receive from sensible Intuition, as how the Thought can combine the objective facts. Phrase it as one may, the difficulty is always the same: *the Many known by the One*. Or does one seriously think he understands better *how* the knower 'connects' its objects, when one calls the former a transcendental Ego and the latter a 'Manifold of Intuition' than when one calls them Thought and Things respectively? Knowing must have a vehicle. Call the vehicle Ego, or call it Thought, Psychosis, Soul, Intelligence, Consciousness, Mind, Reason, Feeling,—what you like—it must *know*. The best grammatical subject for the verb *know* would, if possible, be one from whose other properties the knowing could be deduced. And if there be no such subject, the best one would be that with the fewest ambiguities and the least pretentious name. By Kant's confession, the transcendental Ego has no properties, and from it nothing can be deduced. Its name is pretentious, and, as we shall presently see, has its meaning ambiguously mixed up with that of the substantial soul. So on every possible account we are excused from using it instead of our own term of the present passing 'Thought,' as the principle by which the Many is simultaneously known.

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The *ambiguity* referred to in the meaning of the transcendental Ego is as to whether Kant signified by it an *Agent*, and by the Experience it helps to constitute, an operation; or whether the experience is an event *produced* in an unassigned way, and the Ego a mere indwelling *element* therein contained. If an operation be meant, then Ego and Manifold must both be existent prior to that collision which results in the experience of one by the other. If a mere analysis is meant, there is no such prior existence, and the elements only *are* in so far as they are in union. Now Kant's tone and language are everywhere the very words of one who is talking of operations and the agents by which they are performed.^[288] And yet there is reason to think that at bottom he may have had nothing of the sort in mind.^[289] In this

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uncertainty we need again do no more than decide what to think of his transcendental Ego *if it be* an agent.

Well, if it be so, Transcendentalism is only Substantialism grown shame-faced, and the Ego only a 'cheap and nasty' edition of the soul. All our reasons for preferring the 'Thought' to the 'Soul' apply with redoubled force when the Soul is shrunk to this estate. The Soul truly explained nothing; the 'syntheses,' which she performed, were simply taken ready-made and clapped on to her as expressions of her nature taken after the fact; but at least she had some semblance of nobility and outlook. She was called active; might select; was responsible, and permanent in her way. The Ego is simply *nothing*: as ineffectual and windy an abortion as Philosophy can show. It would indeed be one of Reason's tragedies if the good Kant, with all his honesty and strenuous pains, should have deemed this conception an important outbirth of his thought.

But we have seen that Kant deemed it of next to no importance at all. It was reserved for his Fichtean and Hegelian successors to call it the first Principle of Philosophy, to spell its name in capitals and pronounce it with adoration, to act, in short, as if they were going up in a balloon, whenever the notion of it crossed their mind. Here again, however, I am uncertain of the facts of history, and know that I may not read my authors aright. The whole lesson of Kantian and post-Kantian speculation is, it seems to me, the lesson of simplicity. With Kant, complication both of thought and statement was an inborn infirmity, enhanced by the musty academicism of his Königsberg existence. With Hegel it was a raging fever. Terribly, therefore, do the sour grapes which these fathers of philosophy have eaten set our teeth on edge. We have in England and America, however, a contemporary continuation of Hegelism from which, fortunately, somewhat simpler deliverances come; and, unable to find any definite psychology in what Hegel, Rosenkranz, or Erdmann tells us of the Ego, I turn to Caird and Green.

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The great difference, practically, between these authors and Kant is their complete abstraction from the onlooking Psychologist and from the Reality he thinks he knows; or rather it is the absorption of both of these outlying terms into the proper topic of Psychology, viz., the mental experience of the mind under observation. The Reality coalesces with the connected Manifold, the Psychologist with the Ego, knowing becomes 'connecting,' and there results no longer a finite or criticisable, but an 'absolute' Experience, of which the Object and the Subject are always the same. Our finite 'Thought' is virtually and potentially this eternal (or rather this 'timeless'), absolute Ego, and only provisionally and speciously the limited thing which it seems *prima facie* to be. The later 'sections' of our 'Stream,' which come and appropriate the earlier ones, *are* those earlier ones, just as in substantialism the Soul is throughout all time the same.^[290] This 'solipsistic' character of an Experience conceived as absolute really annihilates psychology as a distinct body of science.

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Psychology is a natural science, an account of particular finite streams of thought, coexisting and succeeding in time. It is of course conceivable (though far from clearly so) that in the last metaphysical resort all these streams of thought may be thought by one universal All-thinker. But in this metaphysical notion there is no profit for psychology; for grant that one Thinker does think in all of us, still what He thinks in me and what in you can never be deduced from the bare idea of Him. The idea of Him seems even to exert a positively paralyzing effect on the mind. The existence of finite thoughts is suppressed altogether. Thought's characteristics, as Professor Green says, are

"not to be sought in the incidents of individual lives which last but for a day...
No knowledge, nor any mental act involved in knowledge, can properly be

called a 'phenomenon of consciousness.'... For a phenomenon is a sensible event, related in the way of antecedence or consequence to other sensible events, but the consciousness which constitutes a knowledge ... is not an event so related nor made up of such events."

Again, if

"we examine the constituents of any perceived object,... we shall find alike that it is only for consciousness that they can exist, and that the consciousness for which they thus exist cannot be merely a series of phenomena or a succession of states.... It then becomes clear that there is a function of consciousness, as exercised in the most rudimentary experience [namely, the function of *synthesis*] which is incompatible with the definition of consciousness as any sort of succession of any sort of phenomena."^[291]

Were we to follow these remarks, we should have to abandon our notion of the 'Thought' (perennially renewed in time, but always cognitive thereof), and to espouse instead of it an entity copied from thought in all essential respects, but differing from it in being 'out of time.' What psychology can gain by this barter would be hard to divine. Moreover this resemblance of the timeless Ego to the Soul is completed by other resemblances still. The monism of the post-Kantian idealists seems always lapsing into a regular old-fashioned spiritualistic dualism. They incessantly talk as if, like the Soul, their All-thinker were an Agent, operating on detached materials of sense. This may come from the accidental fact that the English writings of the school have been more polemic than constructive, and that a reader may often take for a positive profession a statement *ad hominem* meant as part of a reduction to the absurd, or mistake the analysis of a bit of knowledge into elements for a dramatic myth about its creation. But I think the matter has profounder roots. Professor Green constantly talks of the 'activity' of Self as a 'condition' of knowledge taking place. Facts are said to become incorporated with other facts only through the '*action*' of a combining self-consciousness upon data of sensation.'

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"Every object we perceive ... requires, in order to its presentation, the *action* of a principle of consciousness, not itself subject to conditions of time, upon successive appearances, such action as may *hold the appearances together*, without fusion, in an apprehended fact."^[292]

It is needless to repeat that the connection of things in our knowledge is in no whit *explained* by making it the deed of an agent whose essence is self-identity and who is out of time. The agency of phenomenal thought coming and going in time is just as easy to *understand*. And when it is furthermore said that the agent that combines is the same 'self-distinguishing subject' which 'in another mode of its activity' presents the manifold object to itself, the unintelligibilities become quite paroxysmal, and we are forced to confess that the entire school of thought in question, in spite of occasional glimpses of something more refined, still dwells habitually in that mythological stage of thought where phenomena are explained as results of dramas enacted by entities which but reduplicate the characters of the phenomena themselves. The self must not only *know* its object,—that is too bald and dead a relation to be written down and left in its static state. The knowing must be painted as a 'famous victory' in which the object's distinctness is in some way 'overcome.'

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"The self exists as one self only as it opposes itself, as object, to itself as subject, and immediately denies and transcends that opposition. Only because it is such a concrete unity, which has in itself a resolved contradiction, can the intelligence cope with all the manifoldness and division of the mighty universe, and hope to master its secrets. As the lightning sleeps in the dew-drop, so in the

simple and transparent unity of self-consciousness there is held in equilibrium that vital antagonism of opposites which ... seems to rend the world asunder. The intelligence is able to understand the world, or, in other words, to break down the barrier between itself and things and find itself in them, just because its own existence is implicitly the solution of all the division and conflict of things."^[293]

This dynamic (I had almost written dynamitic) way of representing knowledge has the merit of not being tame. To turn from it to our own psychological formulation is like turning from the fireworks, trap-doors, and transformations of the pantomime into the insipidity of the midnight, where

"ghastly through the drizzling rain,
On the bald street breaks the blank day!"^[294]

And yet turn we must, with the confession that our 'Thought'—a cognitive phenomenal event in time—is, if it exist at all, itself the only Thinker which the facts require. The only service that transcendental egoism has done to psychology has been by its protests against Hume's 'bundle'-theory of mind. But this service has been ill-performed; for the Egoists themselves, let them say what they will, believe in the bundle, and in their own system merely *tie it up*, with their special transcendental string, invented for that use alone. Besides, they talk as if, with this miraculous tying or 'relating,' the Ego's duties were done. Of its far more important duty of choosing some of the things it ties and appropriating them, to the exclusion of the rest, they tell us never a word. To sum up, then, my own opinion of the transcendentalist school, it is (whatever ulterior metaphysical truth it may divine) a school in which psychology at least has naught to learn, and whose deliverances about the Ego in particular in no wise oblige us to revise our own formulation of the Stream of Thought.^[295]

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With this, all possible rival formulations have been discussed. The literature of the Self is large, but all its authors may be classed as radical or mitigated representatives of the three schools we have named, substantialism, associationism, or transcendentalism. Our own opinion must be classed apart, although it incorporates essential elements from all three schools. *There need never have been a quarrel between associationism and its rivals if the former had admitted the indecomposable unity of every pulse of thought, and the latter been willing to allow that 'perishing' pulses of thought might recollect and know.*

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We may sum up by saying that personality implies the incessant presence of two elements, an objective person, known by a passing subjective Thought and recognized as continuing in time. *Hereafter let us use the words ME and I for the empirical person and the judging Thought.*

Certain vicissitudes in the me demand our notice.

In the first place, although its changes are gradual, they become in time great. The central part of the *me* is the feeling of the body and of the adjustments in the head; and in the feeling of the body should be included that of the general emotional tones and tendencies, for at bottom these are but the habits in which organic activities and sensibilities run. Well, from infancy to old age, this assemblage of feelings, most constant of all, is yet a prey to slow mutation. Our powers, bodily and mental, change at least as fast.^[296] Our possessions

notoriously are perishable facts. The identity which the *I* discovers, as it surveys this long procession, can only be a relative identity, that of a slow shifting in which there is always some common ingredient retained.^[297] The commonest element of all, the most uniform, is the possession of the same memories. However different the man may be from the youth, both look back on the same childhood, and call it their own.

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Thus the identity found by the *I* in its *me* is only a loosely construed thing, an identity 'on the whole,' just like that which any outside observer might find in the same assemblage of facts. We often say of a man 'he is so changed one would not know him'; and so does a man, less often, speak of himself. These changes in the *me*, recognized by the *I*, or by outside observers, may be grave or slight. They deserve some notice here.

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THE MUTATIONS OF THE SELF

may be divided into two main classes:

1. Alterations of memory; and
2. Alterations in the present bodily and spiritual selves.

1. *Alterations of memory* are either *losses* or false recollections. In either case the *me* is changed. Should a man be punished for what he did in his childhood and no longer remembers? Should he be punished for crimes enacted in post-epileptic unconsciousness, somnambulism, or in any involuntarily induced state of which no recollection is retained? Law, in accord with common-sense, says: "No; he is not the same person forensically now which he was then." These losses of memory are a normal incident of extreme old age, and the person's *me* shrinks in the ratio of the facts that have disappeared.

In dreams we forget our waking experiences; they are as if they were not. And the converse is also true. As a rule, no memory is retained during the waking state of what has happened during mesmeric trance, although when again entranced the person may remember it distinctly, and may then forget facts belonging to the waking state. We thus have, within the bounds of healthy mental life, an approach to an alternation of *me's*.

False memories are by no means rare occurrences in most of us, and, whenever they occur, they distort the consciousness of the *me*. Most people, probably, are in doubt about certain matters ascribed to their past. They may have seen them, may have said them, done them, or they may only have dreamed or imagined they did so. The content of a dream will oftentimes insert itself into the stream of real life in a most perplexing way. The most frequent source of false memory is the accounts we give to others of our experiences. Such accounts we almost always make both more simple and more interesting than the truth. We quote what we should have said or done, rather than what we really said or did; and in the first telling we may be fully aware of the distinction. But ere long the fiction expels the reality from memory and reigns in its stead alone. This is one great source of the fallibility of testimony meant to be quite honest. Especially where the marvellous is concerned, the story takes a tilt that way, and the memory follows the story. Dr. Carpenter quotes from Miss Cobbe the following, as an instance of a very common sort:

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"It happened once to the Writer to hear a most scrupulously conscientious friend narrate an incident of table-turning, to which she appended an assurance that the table rapped when *nobody was within a yard of it*. The writer being confounded by this latter fact, the lady, though fully satisfied of the accuracy of her statement, promised to look at the note she had made ten years previously of the transaction. The note was examined, and was found to contain the

distinct statement that the table rapped when *the hands of six persons rested on it!* The lady's memory as to all other points proved to be strictly correct; and in this point she had erred in entire good faith."^[298]

It is next to impossible to get a story of this sort accurate in all its details, although it is the inessential details that suffer most change.^[299] Dickens and Balzac were said to have constantly mingled their fictions with their real experiences. Every one must have known *some* specimen of our mortal dust so intoxicated with the thought of his own person and the sound of his own voice as never to be able even to think the truth when his autobiography was in question. Amiable, harmless, radiant J. V.! mayst thou ne'er wake to the difference between thy real and thy fondly-imagined self!^[300]

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2. When we pass beyond alterations of memory to abnormal *alterations in the present self* we have still graver disturbances. These alterations are of three main types, from the descriptive point of view. But certain cases unite features of two or more types; and our knowledge of the elements and causes of these changes of personality is so slight that the division into types must not be regarded as having any profound significance. The types are:

- (1) Insane delusions;
- (2) Alternating selves;
- (3) Mediumships or possessions.

1) In insanity we often have delusions projected into the past, which are melancholic or sanguine according to the character of the disease. But the worst alterations of the self come from present perversions of sensibility and impulse which leave the past undisturbed, but induce the patient to think that the present *me* is an altogether new personage. Something of this sort happens normally in the rapid expansion of the whole character, intellectual as well as volitional, which takes place after the time of puberty. The pathological cases are curious enough to merit longer notice.

The basis of our personality, as M. Ribot says, is that feeling of our vitality which, because it is so perpetually present, remains in the background of our consciousness.

"It is the basis because, always present, always acting, without peace or rest, it knows neither sleep nor fainting, and lasts as long as life itself, of which it is one form. It serves as a support to that self-conscious *me* which memory constitutes, it is the medium of association among its other parts.... Suppose now that it were possible at once to change our body and put another into its place: skeleton, vessels, viscera, muscles, skin, everything made new, except the nervous system with its stored-up memory of the past. There can be no doubt that in such a case the afflux of unaccustomed vital sensations would produce the gravest disorders. Between the old sense of existence engraved on the nervous system, and the new one acting with all the intensity of its reality and novelty, there would be irreconcilable contradiction."^[301]

With the beginnings of cerebral disease there often happens something quite comparable to this: [Pg 376]

"Masses of new sensation, hitherto foreign to the individual, impulses and ideas of the same inexperienced kind, for example terrors, representations of enacted crime, of enemies pursuing one, etc. At the outset, these stand in contrast with

the old familiar *me*, as a strange, often astonishing and abhorrent *thou*.^[302] Often their invasion into the former circle of feelings is felt as if the old self were being taken possession of by a dark overpowering might, and the fact of such 'possession' is described in fantastic images. Always this doubleness, this struggle of the old self against the new discordant forms of experience, is accompanied with painful mental conflict, with passion, with violent emotional excitement. This is in great part the reason for the common experience, that the first stage in the immense majority of cases of mental disease is an emotional alteration particularly of a melancholic sort. If now the brain-affection, which is the immediate cause of the new abnormal train of ideas, be not relieved, the latter becomes confirmed. It may gradually contract associations with the trains of ideas which characterized the old self, or portions of the latter may be extinguished and lost in the progress of the cerebral malady, so that little by little the opposition of the two conscious *me*'s abates, and the emotional storms are calmed. But by that time *the old me itself has been falsified and turned into another* by those associations, by that reception into itself of the abnormal elements of feeling and of will. The patient may again be quiet, and his thought sometimes logically correct, but in it the morbid erroneous ideas are always present, with the adhesions they have contracted, as uncontrollable premises, and the man is no longer the same, but a really new person, his old self transformed."^[303]

But the patient himself rarely continues to describe the change in just these terms unless new *bodily sensations* in him or the loss of old ones play a predominant part. Mere perversions of sight and hearing, or even of impulse, soon cease to be felt as contradictions of the unity of the *me*. [Pg 377]

What the particular perversions of the bodily sensibility may be, which give rise to these contradictions, is for the most part impossible for a sound-minded person to conceive. One patient has another self that repeats all his thoughts for him. Others, among whom are some of the first characters in history, have familiar *dæmons* who speak with them, and are replied to. In another someone 'makes' his thoughts for him. Another has two bodies, lying in different beds. Some patients feel as if they had lost parts of their bodies, teeth, brain, stomach, etc. In some it is made of wood, glass, butter, etc. In some it does not exist any longer, or is dead, or is a foreign object quite separate from the speaker's self. Occasionally, parts of the body lose their connection for consciousness with the rest, and are treated as belonging to another person and moved by a hostile will. Thus the right hand may fight with the left as with an enemy.^[304] Or the cries of the patient himself are assigned to another person with whom the patient expresses sympathy. The literature of insanity is filled with narratives of such illusions as these. M. Taine quotes from a patient of Dr. Krishaber an account of sufferings, from which it will be seen how completely aloof from what is normal a man's experience may suddenly become:

"After the first or second day it was for some weeks impossible to observe or analyze myself. The suffering—*angina pectoris*—was too overwhelming. It was not till the first days of January that I could give an account to myself of what I experienced.... Here is the first thing of which I retain a clear remembrance. I was alone, and already a prey to permanent visual trouble, when I was suddenly seized with a visual trouble infinitely more pronounced. Objects grew small and receded to infinite distances—men and things together. I was myself immeasurably far away, I looked about me with terror and astonishment; *the world was escaping from me*.... I remarked at the same time that my voice was extremely far away from me, that it sounded no longer as if mine. I struck the ground with my foot, and perceived its resistance; but this resistance seemed

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illusory—not that the soil was soft, but that the weight of my body was reduced to almost nothing.... I had the feeling of being without weight...." In addition to being so distant, "objects appeared to me *flat*. When I spoke with anyone, I saw him like an image cut out of paper with no relief.... This sensation lasted intermittently for two years.... Constantly it seemed as if my legs did not belong to me. It was almost as bad with my arms. As for my head, it seemed no longer to exist.... I appeared to myself to act automatically, by an impulsion foreign to myself.... There was inside of me a new being, and another part of myself, the old being, which took no interest in the new-comer. I distinctly remember saying to myself that the sufferings of this new being were to me indifferent. I was never really dupe of these illusions, but my mind grew often tired of incessantly correcting the new impressions, and I let myself go and lived the unhappy life of this new entity. I had an ardent desire to see my old world again, to get back to my old self. This desire kept me from killing myself.... I was another, and I hated, I despised this other; he was perfectly odious to me; it was certainly another who had taken my form and assumed my functions."^[305]

In cases similar to this, it is as certain that the *I* is unaltered as that the *me* is changed. That is to say, the present Thought of the patient is cognitive of both the old *me* and the new, so long as its memory holds good. Only, within that objective sphere which formerly lent itself so simply to the judgment of recognition and of egoistic appropriation, strange perplexities have arisen. The present and the past both seen therein will not unite. Where is my old me? What is this new one? Are they the same? Or have I two? Such questions, answered by whatever theory the patient is able to conjure up as plausible, form the beginning of his insane life.^[306]

A case with which I am acquainted through Dr. C. J. Fisher of Tewksbury has possibly its origin in this way. The woman, Bridget F., [Pg 379]

"has been many years insane, and always speaks of her supposed self as 'the rat,' asking me to 'bury the little rat,' etc. Her real self she speaks of in the third person as 'the good woman,' saying, 'The good Woman knew Dr. F. and used to work for him,' etc. Sometimes she sadly asks: 'Do you think the good woman will ever come back?' She works at needlework, knitting, laundry, etc., and shows her work, saying, 'Isn't that good for only a rat?' She has, during periods of depression, hid herself under buildings, and crawled into holes and under boxes. 'She was only a rat, and wants to die,' she would say when we found her."

2. The phenomenon of *alternating personality* in its simplest phases seems based on lapses of memory. Any man becomes, as we say, *inconsistent* with himself if he forgets his engagements, pledges, knowledges, and habits; and it is merely a question of degree at what point we shall say that his personality is changed. In the pathological cases known as those of double or alternate personality the lapse of memory is abrupt, and is usually preceded by a period of unconsciousness or syncope lasting a variable length of time. In the hypnotic trance we can easily produce an alteration of the personality, either by telling the subject to forget all that has happened to him since such or such a date, in which case he becomes (it may be) a child again, or by telling him he is another altogether imaginary personage, in which case all facts about himself seem for the time being to lapse from out his mind, and he throws himself into the new character with a vivacity proportionate to the amount of histrionic imagination which he possesses.^[307] But in the pathological cases the transformation is spontaneous. The most famous case, perhaps, on record is that of Félicité X., reported by Dr. Azam of Bordeaux.^[308] At the age of fourteen this woman began to pass into a 'secondary' state characterized by a change in her general disposition and character, as [Pg 380]

if certain 'inhibitions,' previously existing, were suddenly removed. During the secondary state she remembered the first state, but on emerging from it into the first state she remembered nothing of the second. At the age of forty-four the duration of the secondary state (which was on the whole superior in quality to the original state) had gained upon the latter so much as to occupy most of her time. During it she remembers the events belonging to the original state, but her complete oblivion of the secondary state when the original state recurs is often very distressing to her, as, for example, when the transition takes place in a carriage on her way to a funeral, and she hasn't the least idea which one of her friends may be dead. She actually became pregnant during one of her early secondary states, and during her first state had no knowledge of how it had come to pass. Her distress at these blanks of memory is sometimes intense and once drove her to attempt suicide.

To take another example, Dr. Rieger gives an account^[309] of an epileptic man who for seventeen years had passed his life alternately free, in prisons, or in asylums, his character being orderly enough in the normal state, but alternating with periods, during which he would leave his home for several weeks, leading the life of a thief and vagabond, being sent to jail, having epileptic fits and excitement, being accused of malingering, etc., etc., and with never a memory of the abnormal conditions which were to blame for all his wretchedness.

"I have never got from anyone," says Dr. Rieger, "so singular an impression as from this man, of whom it could not be said that he had any properly conscious past at all.... It is really impossible to think one's self into such a state of mind. His last larceny had been performed in Nürnberg, he knew nothing of it, and saw himself before the court and then in the hospital, but without in the least understanding the reason why. That he had epileptic attacks, he knew. But it was impossible to convince him that for hours together he raved and acted in an abnormal way."

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Another remarkable case is that of Mary Reynolds, lately republished again by Dr. Weir Mitchell.^[310] This dull and melancholy young woman, inhabiting the Pennsylvania wilderness in 1811,

"was found one morning, long after her habitual time for rising, in a profound sleep from which it was impossible to arouse her. After eighteen or twenty hours of sleeping she awakened, but in a state of unnatural consciousness. Memory had fled. To all intents and purposes she was as a being for the first time ushered into the world. 'All of the past that remained to her was the faculty of pronouncing a few words, and this seems to have been as purely instinctive as the wailings of an infant; for at first the words which she uttered were connected with no ideas in her mind.' Until she was taught their significance they were unmeaning sounds.

"Her eyes were virtually for the first time opened upon the world. Old things had passed away; all things had become new.' Her parents, brothers, sisters, friends, were not recognized or acknowledged as such by her. She had never seen them before,—never known them,—was not aware that such persons had been. Now for the first time she was introduced to their company and acquaintance. To the scenes by which she was surrounded she was a perfect stranger. The house, the fields, the forest, the hills, the vales, the streams,—all were novelties. The beauties of the landscape were all unexplored.

"She had not the slightest consciousness that she had ever existed previous to the moment in which she awoke from that mysterious slumber. 'In a word, she was an infant, just born, yet born in a state of maturity, with a capacity for relishing the rich, sublime, luxuriant wonders of created nature.'

"The first lesson in her education was to teach her by what ties she was bound to those by whom she was surrounded, and the duties devolving upon her accordingly. This she was very slow to learn, and, 'indeed, never did learn, or, at least, never would acknowledge the ties of consanguinity, or scarcely those of friendship. She considered those she had once known as for the most part strangers and enemies, among whom she was, by some remarkable and unaccountable means, transplanted, though from what region or state of existence was a problem unsolved.'

"The next lesson was to re-teach her the arts of reading and writing. She was apt enough, and made such rapid progress in both that *in a few weeks* she had readily re-learned to read and write. In copying her name which her brother had written for her as a first lesson, she took her pen in a very awkward manner and began to copy from right to left in the Hebrew mode, as though she had been transplanted from an Eastern soil....

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"The next thing that is noteworthy is the change which took place in her disposition. Instead of being melancholy she was now cheerful to extremity. Instead of being reserved she was buoyant and social. Formerly taciturn and retiring, she was now merry and jocose. Her disposition was totally and absolutely changed. While she was, in this second state, extravagantly fond of company, she was much more enamoured of nature's works, as exhibited in the forests, hills, vales, and water-courses. She used to start in the morning, either on foot or horseback, and ramble until nightfall over the whole country; nor was she at all particular whether she were on a path or in the trackless forest. Her predilection for this manner of life may have been occasioned by the restraint necessarily imposed upon her by her friends, which caused her to consider them her enemies and not companions, and she was glad to keep out of their way.

"She knew no fear, and as bears and panthers were numerous in the woods, and rattlesnakes and copperheads abounded everywhere, her friends told her of the danger to which she exposed herself, but it produced no other effect than to draw forth a contemptuous laugh, as she said, 'I know you only want to frighten me and keep me at home, but you miss it, for I often see your bears and I am perfectly convinced that they are nothing more than black hogs.'

"One evening, after her return from her daily excursion, she told the following incident: 'As I was riding to-day along a narrow path a great black hog came out of the woods and stopped before me. I never saw such an impudent black hog before. It stood up on its hind feet and grinned and gnashed its teeth at me. I could not make the horse go on. I told him he was a fool to be frightened at a hog, and tried to whip him past, but he would not go and wanted to turn back. I told the hog to get out of the way, but he did not mind me. "Well," said I, "if you won't for words, I'll try blows;" so I got off and took a stick, and walked up toward it. When I got pretty close by, it got down on all fours and walked away slowly and sullenly, stopping every few steps and looking back and grinning and growling. Then I got on my horse and rode on.'...

"Thus it continued for five weeks, when one morning, after a protracted sleep, she awoke and was herself again. She recognized the parental, the brotherly, and sisterly ties as though nothing had happened, and immediately went about the performance of duties incumbent upon her, and which she had planned five weeks previously. Great was her surprise at the change which one night (as she supposed) had produced. Nature bore a different aspect. Not a trace was left in her mind of the giddy scenes through which she had passed. Her ramblings through the forest, her tricks and humor, all were faded from her memory, and not a shadow left behind. Her parents saw their child; her brothers and sisters

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saw their sister. She now had all the knowledge that she had possessed in her first state previous to the change, still fresh and in as vigorous exercise as though no change had been. But any new acquisitions she had made, and any new ideas she had obtained, were lost to her now—yet not lost, but laid up out of sight in safe-keeping for future use. Of course her natural disposition returned; her melancholy was deepened by the information of what had occurred. All went on in the old-fashioned way, and it was fondly hoped that the mysterious occurrences of those five weeks would never be repeated, but these anticipations were not to be realized. After the lapse of a few weeks she fell into a profound sleep, and awoke in her second state, taking up her new life again precisely where she had left it when she before passed from that state. She was not now a daughter or a sister. All the knowledge she possessed was that acquired during the few weeks of her former period of second consciousness. She knew nothing of the intervening time. Two periods widely separated were brought into contact. She thought it was but one night.

"In this state she came to understand perfectly the facts of her case, not from memory, but from information. Yet her buoyancy of spirits was so great that no depression was produced. On the contrary, it added to her cheerfulness, and was made the foundation, as was everything else, of mirth.

"These alternations from one state to another continued at intervals of varying length for fifteen or sixteen years, but finally ceased when she attained the age of thirty-five or thirty-six, leaving her *permanently in her second state*. In this she remained without change for the last quarter of a century of her life."

The emotional opposition of the two states seems, however, to have become gradually effaced in Mary Reynolds:

"The change from a gay, hysterical, mischievous woman, fond of jests and subject to absurd beliefs or delusive convictions, to one retaining the joyousness and love of society, but sobered down to levels of practical usefulness, was gradual. The most of the twenty-five years which followed she was as different from her melancholy, morbid self as from the hilarious condition of the early years of her second state. Some of her family spoke of it as her third state. She is described as becoming rational, industrious, and very cheerful, yet reasonably serious; possessed of a well-balanced temperament, and not having the slightest indication of an injured or disturbed mind. For some years she taught school, and in that capacity was both useful and acceptable, being a general favorite with old and young.

"During these last twenty-five years she lived in the same house with the Rev. Dr. John V. Reynolds, her nephew, part of that time keeping house for him, showing a sound judgment and a thorough acquaintance with the duties of her position.

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"Dr. Reynolds, who is still living in Meadville," says Dr. Mitchell, "and who has most kindly placed the facts at my disposal, states in his letter to me of January 4, 1888, that at a later period of her life she said she did sometimes seem to have a dim, dreamy idea of a shadowy past, which she could not fully grasp, and could not be certain whether it originated in a partially restored memory or in the statements of the events by others during her abnormal state.

"Miss Reynolds died in January, 1854, at the age of sixty-one. On the morning of the day of her death she rose in her usual health, ate her breakfast, and superintended household duties. While thus employed she suddenly raised her hands to her head and exclaimed: 'Oh! I wonder what is the matter with my

head!" and immediately fell to the floor. When carried to a sofa she gasped once or twice and died."

In such cases as the preceding, in which the secondary character is superior to the first, there seems reason to think that the first one is the morbid one. The word *inhibition* describes its dulness and melancholy. Félicité X.'s original character was dull and melancholy in comparison with that which she later acquired, and the change may be regarded as the removal of inhibitions which had maintained themselves from earlier years. Such inhibitions we all know temporarily, when we can not recollect or in some other way command our mental resources. The systematized amnesias (losses of memory) of hypnotic subjects ordered to forget all nouns, or all verbs, or a particular letter of the alphabet, or all that is relative to a certain person, are inhibitions of the sort on a more extensive scale. They sometimes occur spontaneously as symptoms of disease.^[311] Now M. Pierre Janet has shown that such inhibitions when they bear on a certain class of sensations (making the subject anæsthetic thereto) and also on the memory of such sensations, are the basis of changes of personality. The anæsthetic and 'amnesic' hysteric is one person; but when you restore her inhibited sensibilities and memories by plunging her into the hypnotic trance—in other words, when you rescue them from their 'dissociated' and split-off condition, and make them rejoin the other sensibilities and memories—she is a different person. As said above (p. 203), the hypnotic trance is one method of restoring sensibility in hysterics. But one day when the hysteric anæsthetic named Lucie was already in the hypnotic trance, M. Janet for a certain reason continued to make passes over her for a full half-hour as if she were not already asleep. The result was to throw her into a sort of syncope from which, after half an hour, she revived in a second somnambulant condition entirely unlike that which had characterized her thitherto—different sensibilities, a different memory, a different person, in short. In the waking state the poor young woman was anæsthetic all over, nearly deaf, and with a badly contracted field of vision. Bad as it was, however, sight was her best sense, and she used it as a guide in all her movements. With her eyes bandaged she became entirely helpless, and like other persons of a similar sort whose cases have been recorded, she almost immediately fell asleep in consequence of the withdrawal of her last sensorial stimulus. M. Janet calls this waking or primary (one can hardly in such a connection say 'normal') state by the name of Lucie 1. In Lucie 2, her first sort of hypnotic trance, the anæsthesias were diminished but not removed. In the deeper trance, 'Lucie 3,' brought about as just described, no trace of them remained. Her sensibility became perfect, and instead of being an extreme example of the 'visual' type, she was transformed into what in Prof. Charcot's terminology is known as a motor. That is to say, that whereas when awake she had thought in visual terms exclusively, and could imagine things only by remembering how they *looked*, now in this deeper trance her thoughts and memories seemed to M. Janet to be largely composed of images of movement and of touch.

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Having discovered this deeper trance and change of personality in Lucie, M. Janet naturally became eager to find it in his other subjects. He found it in Rose, in Marie, and in Léonie; and his brother, Dr. Jules Janet, who was *interne* at the Salpêtrière Hospital, found it in the celebrated subject Wit.... whose trances had been studied for years by the various doctors of that institution without any of them having happened to awaken this very peculiar individuality.^[312]

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With the return of all the sensibilities in the deeper trance, these subjects turned, as it were, into normal persons. Their memories in particular grew more extensive, and hereupon M. Janet spins a theoretic generalization. *When a certain kind of sensation, he says, is abolished in an hysteric patient, there is also abolished along with it all recollection of past sensations of that kind.* If, for example, hearing be the anæsthetic sense, the patient becomes unable even to imagine sounds and voices, and has to speak (when speech is still possible) by means of motor or articulatory cues. If the motor sense be abolished, the patient must will the movements of his limbs by first defining them to his mind in visual terms, and must

innervate his voice by premonitory ideas of the way in which the words are going to sound. The practical consequences of this law would be great, for all experiences belonging to a sphere of sensibility which afterwards became anæsthetic, as, for example, touch, would have been stored away and remembered in tactile terms, and would be incontinently forgotten as soon as the cutaneous and muscular sensibility should come to be cut out in the course of disease. Memory of them would be restored again, on the other hand, so soon as the sense of touch came back. Now, in the hysteric subjects on whom M. Janet experimented, touch did come back in the state of trance. The result was that all sorts of memories, absent in the ordinary condition, came back too, and they could then go back and explain the origin of many otherwise inexplicable things in their life. One stage in the great convulsive crisis of hystero-epilepsy, for example, is what French writers call the *phase des attitudes passionnelles*, in which the patient, without speaking or giving any account of herself, will go through the outward movements of fear, anger, or some other emotional state of mind. Usually this phase is, with each patient, a thing so stereotyped as to seem automatic, and doubts have even been expressed as to whether any consciousness exists whilst it lasts. When, however, the patient Lucie's tactile sensibility came back in the deeper trance, she explained the origin of her hysteric crisis in a great fright which she had had when a child, on a day when certain men, hid behind the curtains, had jumped out upon her; she told how she went through this scene again in all her crises; she told of her sleep-walking fits through the house when a child, and how for several months she had been shut in a dark room because of a disorder of the eyes. All these were things of which she recollected nothing when awake, because they were records of experiences mainly of motion and of touch.

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But M. Janet's subject Léonie is interesting, and shows best how with the sensibilities and motor impulses the memories and character will change.

"This woman, whose life sounds more like an improbable romance than a genuine history, has had attacks of natural somnambulism since the age of three years. She has been hypnotized constantly by all sorts of persons from the age of sixteen upwards, and she is now forty-five. Whilst her normal life developed in one way in the midst of her poor country surroundings, her second life was passed in drawing-rooms and doctors' offices, and naturally took an entirely different direction. To-day, when in her normal state, this poor peasant woman is a serious and rather sad person, calm and slow, very mild with every one, and extremely timid: to look at her one would never suspect the personage which she contains. But hardly is she put to sleep hypnotically when a metamorphosis occurs. Her face is no longer the same. She keeps her eyes closed, it is true, but the acuteness of her other senses supplies their place. She is gay, noisy, restless, sometimes insupportably so. She remains good-natured, but has acquired a singular tendency to irony and sharp jesting. Nothing is more curious than to hear her after a sitting when she has received a visit from strangers who wished to see her asleep. She gives a word-portrait of them, apes their manners, pretends to know their little ridiculous aspects and passions, and for each invents a romance. To this character must be added the possession of an enormous number of recollections, whose existence she does not even suspect when awake, for her amnesia is then complete.... She refuses the name of Léonie and takes that of Léontine (Léonie 2) to which her first magnetizers had accustomed her. 'That good woman is not myself,' she says, 'she is too stupid!' To herself, Léontine or Léonie 2, she attributes all the sensations and all the actions, in a word all the conscious experiences which she has undergone *in somnambulism*, and knits them together to make the history of her already long life. To Léonie 1 [as M. Janet calls the waking woman] on the other hand, she exclusively ascribes the events lived through in waking hours. I was at first struck by an important exception to the rule, and was disposed to think that

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there might be something arbitrary in this partition of her recollections. In the normal state Léonie has a husband and children; but Léonie 2, the somnambulist, whilst acknowledging the children as her own, attributes the husband to 'the other.' This choice, was perhaps explicable, but it followed no rule. It was not till later that I learned that her magnetizers in early days, as audacious as certain hypnotizers of recent date, had somnambulized her for her first *accouchements*, and that she had lapsed into that state spontaneously in the later ones. Léonie 2 was thus quite right in ascribing to herself the children—it was she who had had them, and the rule that her first trance-state forms a different personality was not broken. But it is the same with her second or deepest state of trance. When after the renewed passes, syncope, etc., she reaches the condition which I have called Léonie 3, she is another person still. Serious and grave, instead of being a restless child, she speaks slowly and moves but little. Again she separates herself from the waking Léonie 1. 'A good but rather stupid woman,' she says, 'and not me.' And she also separates herself from Léonie 2: 'How can you see anything of me in that crazy creature?' she says. 'Fortunately I am nothing for her.'

Léonie 1 knows only of herself; Léonie 2, of herself and of Léonie 1; Léonie 3 knows of herself and of both the others. Léonie 1 has a visual consciousness; Léonie 2 has one both visual and auditory; in Léonie 3 it is at once visual, auditory, and tactile. Prof. Janet thought at first that he was Léonie 3's discoverer. But she told him that she had been frequently in that condition before. A former magnetizer had hit upon her just as M. Janet had, in seeking by means of passes to deepen the sleep of Léonie 2.

"This resurrection of a somnambulant personage who had been extinct for twenty years is curious enough; and in speaking to Léonie 3, I naturally now adopt the name of Léonore which was given her by her first master."

The most carefully studied case of multiple personality is that of the hysteric youth Louis V. about whom MM. Bourru and Burot have written a book.^[313] The symptoms are too intricate to be reproduced here with detail. Suffice it that Louis V. had led an irregular life, in the army, in hospitals, and in houses of correction, and had had numerous hysteric anæsthesias, paralyzes, and contractures attacking him differently at different times and when he lived at different places. At eighteen, at an agricultural House of Correction he was bitten by a viper, which brought on a convulsive crisis and left *both of his legs* paralyzed for three years. During this condition he was gentle, moral, and industrious. But suddenly at last, after a long convulsive seizure, his paralysis disappeared, and with it his memory for all the time during which it had endured. His character also changed: he became quarrelsome, gluttonous, impolite, stealing his comrades' wine, and money from an attendant, and finally escaped from the establishment and fought furiously when he was overtaken and caught. Later, when he first fell under the observation of the authors, his *right side* was half paralyzed and insensible, and his character intolerable; the application of metals transferred the paralysis to the *left* side, abolished his recollections of the other condition, and carried him psychically back to the hospital of Bicêtre where he had been treated for a similar physical condition. His character, opinions, education, all underwent a concomitant transformation. He was no longer the personage of the moment before. It appeared ere long that any present nervous disorder in him could be temporarily removed by metals, magnets, electric or other baths, etc.; and that any past disorder could be brought back by hypnotic suggestion. He also went through a rapid spontaneous repetition of his series of past disorders after each of the convulsive attacks which occurred in him at intervals. It was observed that each physical state in which he found himself, excluded certain memories and brought with it a definite modification of character.

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"The law of these changes," say the authors, "is quite clear. There exist precise, constant, and necessary relations between the bodily and the mental state, such that it is impossible to modify the one without modifying the other in a parallel fashion."^[314]

The case of this proteiform individual would seem, then, nicely to corroborate M. P. Janet's law that anæsthesias and gaps in memory go together. Coupling Janet's law with Locke's that changes of memory bring changes of personality, we should have an apparent explanation of some cases at least of alternate personality. But mere anæsthesia does not sufficiently explain the changes of disposition, which are probably due to modifications in the perviousness of motor and associative paths, co-ordinate with those of the sensorial paths rather than consecutive upon them. And indeed a glance at other cases than M. Janet's own, suffices to show us that sensibility and memory are not coupled in any invariable way.^[315] M. Janet's law, true of his own cases, does not seem to hold good in all. [Pg 390]

Of course it is mere guesswork to speculate on what may be the cause of the amnesias which lie at the bottom of changes in the Self. Changes of blood-supply have naturally been invoked. Alternate action of the two hemispheres was long ago proposed by Dr. Wigan in his book on the Duality of the Mind. I shall revert to this explanation after considering the third class of alterations of the Self, those, namely, which I have called 'possessions.'

I have myself become quite recently acquainted with the subject of a case of alternate personality of the 'ambulatory' sort, who has given me permission to name him in these pages.^[316] [Pg 391]

The Rev. Ansel Bourne, of Greene, R. I., was brought up to the trade of a carpenter; but, in consequence of a sudden temporary loss, of sight and hearing under very peculiar circumstances, he became converted from Atheism to Christianity just before his thirtieth year, and has since that time for the most part lived the life of an itinerant preacher. He has been subject to headaches and temporary fits of depression of spirits during most of his life, and has had a few fits of unconsciousness lasting an hour or less. He also has a region of somewhat diminished cutaneous sensibility on the left thigh. Otherwise his health is good, and his muscular strength and endurance excellent. He is of a firm and self-reliant disposition, a man whose yea is yea and his nay, nay; and his character for uprightness is such in the community that no person who knows him will for a moment admit the possibility of his case not being perfectly genuine.

On January 17, 1887, he drew 551 dollars from a bank in Providence with which to pay for a certain lot of land in Greene, paid certain bills, and got into a Pawtucket horse-car. This is the last incident which he remembers. He did not return home that day, and nothing was heard of him for two months. He was published in the papers as missing, and foul play being suspected, the police sought in vain his whereabouts. On the morning of March 14th, however, at Norristown, Pennsylvania, a man calling himself A. J. Brown, who had rented a small shop six weeks previously, stocked it with stationery, confectionery, fruit and small articles, and carried on his quiet trade without seeming to any one unnatural or eccentric, woke up in a fright and called in the people of the house to tell him where he was. He said that his name was Ansel Bourne, that he was entirely ignorant of Norristown, that he knew nothing of shop-keeping, and that the last thing he remembered—it seemed only yesterday—was drawing the money from the bank, etc., in Providence. He would not believe that two months had elapsed. The people of the house thought him insane; and so, at first, did Dr. Louis H. Read, whom they called in to see him. But on

telegraphing to Providence, confirmatory messages came, and presently his nephew, Mr. Andrew Harris, arrived upon the scene, made everything straight, and took him home. He was very weak, having lost apparently over twenty pounds of flesh during his escapade, and had such a horror of the idea of the candy-store that he refused to set foot in it again.

The first two weeks of the period remained unaccounted for, as he had no memory, after he had once resumed his normal personality, of any part of the time, and no one who knew him seems to have seen him after he left home. The remarkable part of the change is, of course, the peculiar occupation which the so-called Brown indulged in. Mr. Bourne has never in his life had the slightest contact with trade. 'Brown' was described by the neighbors as taciturn, orderly in his habits, and in no way queer. He went to Philadelphia several times; replenished his stock; cooked for himself in the back shop, where he also slept; went regularly to church; and once at a prayer-meeting made what was considered by the hearers a good address, in the course of which he related an incident which he had witnessed in his natural state of Bourne.

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This was all that was known of the case up to June 1890, when I induced Mr. Bourne to submit to hypnotism, so as to see whether, in the hypnotic trance, his 'Brown' memory would not come back. It did so with surprising readiness; so much so indeed that it proved quite impossible to make him whilst in the hypnosis remember any of the facts of his normal life. He had heard of Ansel Bourne, but "didn't know as he had ever met the man." When confronted with Mrs. Bourne he said that he had "never seen the woman before," etc. On the other hand, he told of his peregrinations during the lost fortnight,^[317] and gave all sorts of details about the Norristown episode. The whole thing was prosaic enough; and the Brown-personality seems to be nothing but a rather shrunken, dejected, and amnesic extract of Mr. Bourne himself. He gives no motive for the wandering except that there was 'trouble back there' and he 'wanted rest.' During the trance he looks old, the corners of his mouth are drawn down, his voice is slow and weak, and he sits screening his eyes and trying vainly to remember what lay before and after the two months of the Brown experience. "I'm all hedged in," he says: "I can't get out at either end. I don't know what set me down in that Pawtucket horse-car, and I don't know how I ever left that store, or what became of it." His eyes are practically normal, and all his sensibilities (save for tardier response) about the same in hypnosis as in waking. I had hoped by suggestion, etc., to run the two personalities into one, and make the memories continuous, but no artifice would avail to accomplish this, and Mr. Bourne's skull to-day still covers two distinct personal selves.

The case (whether it contain an epileptic element or not) should apparently be classed as one of spontaneous hypnotic trance, persisting for two months. The peculiarity of it is that nothing else like it ever occurred in the man's life, and that no eccentricity of character came out. In most similar cases, the attacks recur, and the sensibilities and conduct markedly change.^[318]

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3. In '*mediumships*' or '*possessions*' the invasion and the passing away of the secondary state are both relatively abrupt, and the duration of the state is usually short—i.e., from a few minutes to a few hours. Whenever the secondary state is well developed no memory for aught that happened during it remains after the primary consciousness comes back. The subject during the secondary consciousness speaks, writes, or acts as if animated by a foreign person, and often names this foreign person and gives his history. In old times the

foreign 'control' was usually a demon, and is so now in communities which favor that belief. With us he gives himself out at the worst for an Indian or other grotesquely speaking but harmless personage. Usually he purports to be the spirit of a dead person known or unknown to those present, and the subject is then what we call a 'medium.' Mediumistic possession in all its grades seems to form a perfectly natural special type of alternate personality, and the susceptibility to it in some form is by no means an uncommon gift, in persons who have no other obvious nervous anomaly. The phenomena are very intricate, and are only just beginning to be studied in a proper scientific way. The lowest phase of mediumship is automatic writing, and the lowest grade of that is where the Subject knows what words are coming, but feels impelled to write them as if from without. Then comes writing unconsciously, even whilst engaged in reading or talk. Inspirational speaking, playing on musical instruments, etc., also belong to the relatively lower phases of possession, in which the normal self is not excluded from conscious participation in the performance, though their initiative seems to come from elsewhere. In the highest phase the trance is complete, the voice, language, and everything are changed, and there is no after-memory whatever until the next trance comes. One curious thing about trance-utterances is their generic similarity in different individuals. The 'control' here in America is either a grotesque, slangy, and flippant personage ('Indian' controls, calling the ladies 'squaws,' the men 'braves,' the house a 'wigwam,' etc., etc., are excessively common); or, if he ventures on higher intellectual flights, he abounds in a curiously vague optimistic philosophy-and-water, in which phrases about spirit, harmony, beauty, law, progression, development, etc., keep recurring. It seems exactly as if one author composed more than half of the trance-messages, no matter by whom they are uttered. Whether all sub-conscious selves are peculiarly susceptible to a certain stratum of the *Zeitgeist*, and get their inspiration from it, I know not; but this is obviously the case with the secondary selves which become 'developed' in spiritualist circles. There the beginnings of the medium trance are indistinguishable from effects of hypnotic suggestion. The subject assumes the rôle of a medium simply because opinion expects it of him under the conditions which are present; and carries it out with a feebleness or a vivacity proportionate to his histrionic gifts. But the odd thing is that persons unexposed to spiritualist traditions will so often act in the same way when they become entranced, speak in the name of the departed, go through the motions of their several death-agonies, send messages about their happy home in the summer-land, and describe the ailments of those present. I have no theory to publish of these cases, several of which I have personally seen.

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As an example of the automatic writing performances I will quote from an account of his own case kindly furnished me by Mr. Sidney Dean of Warren, R I., member of Congress from Connecticut from 1855 to 1859, who has been all his life a robust and active journalist, author, and man of affairs. He has for many years been a writing subject, and has a large collection of manuscript automatically produced.

"Some of it," he writes us, "is in hieroglyph, or strange compounded arbitrary characters, each series possessing a seeming unity in general design or character, followed by what purports to be a translation or rendering into mother English. I never attempted the seemingly impossible feat of copying the characters. They were cut with the precision of a graver's tool, and generally with a single rapid stroke of the pencil. Many languages, some obsolete and passed from history, are professedly given. To see them would satisfy you that no one could copy them except by tracing.

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"These, however, are but a small part of the phenomena. The 'automatic' has given place to the *impressional*, and when the work is in progress I am in the normal condition, and seemingly two minds, intelligences, persons, are practically engaged. The writing is in my own hand but the dictation not of my own mind and will, but that of another, upon subjects of which I can have no

knowledge and hardly a theory; and I, myself, consciously criticise the thought, fact, mode of expressing it, etc., while the hand is recording the subject-matter and even the words impressed to be written. If I refuse to write the sentence, or even the word, the impression instantly ceases, and my willingness must be mentally expressed before the work is resumed, and it is resumed at the point of cessation, even if it should be in the middle of a sentence. Sentences are commenced without knowledge of mine as to their subject or ending. In fact, I have never known in advance the subject of disquisition.

"There is in progress now, at uncertain times, not subject to my will, a series of twenty-four chapters upon the scientific features of life, moral, spiritual, eternal. Seven have already been written in the manner indicated. These were preceded by twenty-four chapters relating generally to the life beyond material death, its characteristics, etc. Each chapter is signed by the name of some person who has lived on earth,—some with whom I have been personally acquainted, others known in history.... I know nothing of the alleged authorship of any chapter until it is completed and the name impressed and appended.... I am interested not only in the reputed authorship,—of which I have nothing corroborative,—but in the philosophy taught, of which I was in ignorance until these chapters appeared. From my standpoint of life—which has been that of biblical orthodoxy—the philosophy is new, seems to be reasonable, and is logically put. I confess to an inability to successfully controvert it to my own satisfaction.

"It is an intelligent *ego* who writes, or else the influence assumes individuality, which practically makes of the influence a personality. It is *not* myself; of that I am conscious at every step of the process. I have also traversed the whole field of the claims of 'unconscious cerebration,' so called, so far as I am competent to critically examine it, and it fails, as a theory, in numberless points, when applied to this strange work through me. It would be far more reasonable and satisfactory for me to accept the silly hypothesis of re-incarnation,—the old doctrine of metempsychosis,—as taught by some spiritualists to-day, and to believe that I lived a former life here, and that once in a while it dominates my intellectual powers, and writes chapters upon the philosophy of life, or opens a post-office for spirits to drop their effusions, and have them put into English script. No; the easiest and most natural solution to me is to admit the claim made, i.e., that it is a decarnated intelligence who writes. But *who?* that is the question. The names of scholars and thinkers who once lived are affixed to the most ungrammatical and weakest of *bosh*....

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"It seems reasonable to me—upon the hypothesis that it is a person using another's mind or brain—that there must be more or less of that other's style or tone incorporated in the message, and that to the unseen personality, i.e., the power which impresses, the thought, the fact, or the philosophy, and not the style or tone, belongs. For instance, while the influence is impressing my brain with the greatest force and rapidity, so that my pencil fairly flies over the paper to record the thoughts, I am conscious that, in many cases, the vehicle of the thought, i.e., the language, is very natural and familiar to me, as if, somehow, *my* personality as a writer was getting mixed up with the message. And, again, the style, language, everything, is entirely foreign to my own style."

I am myself persuaded by abundant acquaintance with the trances of one medium that the 'control' may be altogether different from any *possible* waking self of the person. In the case I have in mind, it professes to be a certain departed French doctor; and is, I am convinced, acquainted with facts about the circumstances, and the living and dead relatives and acquaintances, of numberless sitters whom the medium never met before, and of whom she has never heard the names. I record my bare opinion here unsupported by the evidence, not,

of course, in order to convert anyone to my view, but because I am persuaded that a serious study of these trance-phenomena is one of the greatest needs of psychology, and think that my personal confession may possibly draw a reader or two into a field which the *soi-disant* 'scientist' usually refuses to explore.

Many persons have found evidence conclusive to their minds that in some cases the control is really the departed spirit whom it pretends to be. The phenomena shade off so gradually into cases where this is obviously absurd, that the presumption (quite apart from *a priori* 'scientific' prejudice) is great against its being true. The case of Lurancy Vennum is perhaps as extreme a case of 'possession' of the modern sort as one can find.^[319] Lurancy was a young girl of fourteen, living with her parents at Watseka, Ill., who (after various distressing hysterical disorders and spontaneous trances, during which she was possessed by departed spirits of a more or less grotesque sort) finally declared herself to be animated by the spirit of Mary Roff (a neighbor's daughter, who had died in an insane asylum twelve years before) and insisted on being sent 'home' to Mr. Roff's house. After a week of 'homesickness' and importunity on her part, her parents agreed, and the Roffs, who pitied her, and who were spiritualists into the bargain, took her in. Once there, she seems to have convinced the family that their dead Mary had exchanged habitations with Lurancy. Lurancy was said to be temporarily in heaven, and Mary's spirit now controlled her organism, and lived again in her former earthly home.

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"The girl, now in her new home, seemed perfectly happy and content, knowing every person and everything that Mary knew when in her original body, twelve to twenty-five years ago, recognizing and calling by name those who were friends and neighbors of the family from 1852 to 1865, when Mary died, calling attention to scores, yes, hundreds of incidents that transpired during her natural life. During all the period of her sojourn at Mr. Roff's she had no knowledge of, and did not recognize, any of Mr. Vennum's family, their friends or neighbors, yet Mr. and Mrs. Vennum and their children visited her and Mr. Roff's people, she being introduced to them as to any strangers. After frequent visits, and hearing them often and favorably spoken of, she learned to love them as acquaintances, and visited them with Mrs. Roff three times. From day to day she appeared natural, easy, affable, and industrious, attending diligently and faithfully to her household duties, assisting in the general work of the family as a faithful, prudent daughter might be supposed to do, singing, reading, or conversing as opportunity offered, upon all matters of private or general interest to the family."

The so-called Mary whilst at the Roffs' would sometimes 'go back to heaven,' and leave the body in a 'quiet trance,' i.e., without the original personality of Lurancy returning. After eight or nine weeks, however, the memory and manner of Lurancy would sometimes partially, but not entirely, return for a few minutes. Once Lurancy seems to have taken full possession for a short time. At last, after some fourteen weeks, conformably to the prophecy which 'Mary' had made when she first assumed 'control,' she departed definitively and the Lurancy-consciousness came back for good. Mr. Roff writes:

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"She wanted me to take her home, which I did. She called me Mr. Roff, and talked with me as a young girl would, not being acquainted. I asked her how things appeared to her—if they seemed natural. She said it seemed like a dream to her. She met her parents and brothers in a very affectionate manner, hugging and kissing each one in tears of gladness. She clasped her arms around her father's neck a long time, fairly smothering him with kisses. I saw her father just now (eleven o'clock). He says she has been perfectly natural, and seems entirely well."

Lurancy's mother writes, a couple of months later, that she was

"perfectly and entirely well and natural. For two or three weeks after her return home, she seemed a little strange to what she had been before she was taken sick last summer, but only, perhaps, the natural change that had taken place with the girl, and except it seemed to her as though she had been dreaming or sleeping, etc. Lurancy has been smarter, more intelligent, more industrious, more womanly, and more polite than before. We give the credit of her complete cure and restoration to her family, to Dr. E. W. Stevens, and Mr. and Mrs. Roff, by their obtaining her removal to Mr. Roff's, where her cure was perfected. We firmly believe that, had she remained at home, she would have died, or we would have been obliged to send her to the insane asylum; and if so, that she would have died there; and further, that I could not have lived but a short time with the care and trouble devolving on me. Several of the relatives of Lurancy, including ourselves, now believe she was cured by spirit power, and that Mary Roff controlled the girl."

Eight years later, Lurancy was reported to be married and a mother, and in good health. She had apparently outgrown the mediumistic phase of her existence.^[320]

On the condition of the sensibility during these invasions, few observations have been made. I have found the hands of two automatic writers anæsthetic during the act. In two others I have found this not to be the case. Automatic writing is usually preceded by shooting pains along the arm-nerves and irregular contractions of the arm-muscles. I have found one medium's tongue and lips apparently insensible to pin-pricks during her (speaking) trance.

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If we speculate on the brain-condition during all these different perversions of personality, we see that it must be supposed capable of successively changing all its modes of action, and abandoning the use for the time being of whole sets of well-organized association-paths. In no other way can we explain the loss of memory in passing from one alternating condition to another. And not only this, but we must admit that organized systems of paths can be thrown out of gear with others, so that the processes in one system give rise to one consciousness, and those of another system to another *simultaneously* existing consciousness. Thus only can we understand the facts of automatic writing, etc., whilst the patient is out of trance, and the false anæsthesias and amnesias of the hysteric type. But just what sort of dissociation the phrase 'thrown out of gear' may stand for, we cannot even conjecture; only I think we ought not to talk of the doubling of the self as if it consisted in the failure to combine on the part of certain systems of *ideas* which usually do so. It is better to talk of *objects* usually combined, and which are now divided between the two 'selves,' in the hysteric and automatic cases in question. Each of the selves is due to a system of cerebral paths acting by itself. If the brain acted normally, and the dissociated systems came together again, we should get a new affection of consciousness in the form of a third 'Self' different from the other two, but knowing their objects together, as the result.—After all I have said in the last chapter, this hardly needs further remark.

Some peculiarities in the lower automatic performances suggest that the systems thrown out of gear with each other are contained one in the right and the other in the left hemisphere. The subjects, e.g., often write backwards, or they transpose letters, or they write mirror-script. All these are symptoms of agraphic disease. The left hand, if left to its natural

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impulse, will in most people write mirror-script more easily than natural script. Mr. F. W. H. Myers has laid stress on these analogies.^[321] He has also called attention to the usual inferior moral tone of ordinary planchette writing. On Hughlings Jackson's principles, the left hemisphere, being the more evolved organ, at ordinary times inhibits the activity of the right one; but Mr. Myers suggests that during the automatic performances the usual inhibition may be removed and the right hemisphere set free to act all by itself. This is very likely to some extent to be the case. But the crude explanation of 'two' selves by 'two' hemispheres is of course far from Mr. Myers's thought. The selves may be more than two, and the brain-systems severally used for each must be conceived as interpenetrating each other in very minute ways.

SUMMARY.

To sum up now this long chapter. The consciousness of Self involves a stream of thought, each part of which as 'I' can 1) remember those which went before, and know the things they knew; and 2) emphasize and care paramountly for certain ones among them as 'me,' and *appropriate to these* the rest. The nucleus of the 'me' is always the bodily existence felt to be present at the time. Whatever remembered-past-feelings *resemble* this present feeling are deemed to belong to the same *me* with it. Whatever other things are perceived to be *associated* with this feeling are deemed to form part of that me's *experience*; and of them certain ones (which fluctuate more or less) are reckoned to be themselves *constituents* of the me in a larger sense,—such are the clothes, the material possessions, the friends, the honors and esteem which the person receives or may receive. This me is an empirical aggregate of things objectively known. The *I* which knows them cannot itself be an aggregate, neither for psychological purposes need it be considered to be an unchanging metaphysical entity like the Soul, or a principle like the pure Ego, viewed as 'out of time.' It is a *Thought*, at each moment different from that of the last moment, but *appropriative* of the latter, together with all that the latter called its own. All the experiential facts find their place in this description, unencumbered with any hypothesis save that of the existence of passing thoughts or states of mind. The same brain may subserve many conscious selves, either alternate or coexisting; but by what modifications in its action, or whether ultra-cerebral conditions may intervene, are questions which cannot now be answered.

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If anyone urge that I assign no *reason* why the successive passing thoughts should inherit each other's possessions, or why they and the brain-states should be functions (in the mathematical sense) of each other, I reply that the reason, if there be any, must lie where all real reasons lie, in the total sense or meaning of the world. If there be such a meaning, or any approach to it (as we are bound to trust there is), it alone can make clear to us why such finite human streams of thought are called into existence in such functional dependence upon brains. This is as much as to say that the special natural science of *psychology* must stop with the mere functional formula. *If the passing thought be the directly verifiable existent which no school has hitherto doubted it to be, then that thought is itself the thinker,* and psychology need not look beyond. The only pathway that I can discover for bringing in a more transcendental thinker would be to *deny* that we have any *direct* knowledge of the thought as such. The latter's existence would then be reduced to a postulate, an assertion that there *must be a knower* correlative to all this *known*; and the problem *who that knower is* would have become a metaphysical problem. With the question once stated in these terms, the spiritualist and transcendentalist solutions must be considered as *prima facie* on a par with our own psychological one, and discussed impartially. But that carries us beyond the psychological or naturalistic point of view.

- [257] See, for a charming passage on the Philosophy of Dress, H. Lotze's *Microcosmus*, Eng. tr. vol. i, p. 592 ff.
- [258] "Who filches from me my good name," etc.
- [259] "He who imagines commendation and disgrace not to be strong motives on men ... seems little skilled in the nature and history of mankind; the greatest part whereof he shall find to govern themselves chiefly, if not solely, by this law of fashion; and so they do that which keeps them in reputation with their company, little regard the laws of God or the magistrate. The penalties that attend the breach of God's laws some, nay, most, men seldom seriously reflect on; and amongst those that do, many, whilst they break the laws, entertain thoughts of future reconciliation, and making their peace for such breaches: and as to the punishments due from the laws of the commonwealth, they frequently flatter themselves with the hope of impunity. But no man escapes the punishment of *their* censure and dislike who offends against the fashion and opinion of the company he keeps, and would recommend himself to. Nor is there one in ten thousand who is stiff and insensible enough to bear up under the constant dislike and condemnation of his own club. He must be of a strange and unusual constitution who can content himself to live in constant disgrace and disrepute with his own particular society. Solitude many men have sought and been reconciled to; but nobody that has the least thought or sense of a man about him can live in society under the constant dislike and ill opinion of his familiars and those he converses with. This is a burden too heavy for human sufferance: and he must be made up of irreconcilable contradictions who can take pleasure in company and yet be insensible of contempt and disgrace from his companions." (Locke's *Essay*, book ii, ch. xxviii, § 12.)
- [260] For some farther remarks on these feelings of movement see the [next chapter](#).
- [261] Wundt's account of Self-consciousness deserves to be compared with this. What I have called 'adjustments' he calls processes of 'Apperception.' "In this development (of consciousness) one particular group of percepts claims a prominent significance, namely, those of which the spring lies in ourselves. The images of feelings we get from our own body, and the representations of our own movements distinguish themselves from all others by forming a *permanent* group. As there are always some muscles in a state either of tension or of activity it follows that we never lack a sense, either dim or clear, of the positions or movements of our body.... This permanent sense, moreover, has this peculiarity, that we are aware of our power at any moment voluntarily to arouse any one of its ingredients. We excite the sensations of movement immediately by such impulses of the will as shall arouse the movements themselves; and we excite the visual and tactile feelings of our body by the voluntary movement of our organs of sense. So we come to conceive this permanent mass of feeling as immediately or remotely subject to our will, and call it the *consciousness of ourself*. This self-consciousness is, at the outset, thoroughly sensational,... only gradually the second-named of its characters, its subjection to our will, attains predominance. In proportion as the apperception of all our mental objects appears to us as an inward exercise of will, does our self-consciousness begin both to widen itself and to narrow itself at the same time. It widens itself in that every mental act whatever comes to stand in relation to our will; and it narrows itself in that it concentrates itself more and more upon the inner activity of apperception, over against which our own body and all the representations connected with it appear as external objects, different from our proper self. This consciousness, contracted down to the process of apperception, we call our Ego; and the apperception of mental objects in general, may thus, after Leibnitz, be designated as the raising of them into our self-consciousness. Thus the natural development of self-consciousness implicitly involves the most abstract forms in which this faculty has been described in philosophy; only philosophy is fond of placing the abstract ego at the outset, and

so reversing the process of development. Nor should we overlook the fact that the completely abstract ego [as pure activity], although suggested by the natural development of our consciousness, is never actually found therein. The most speculative of philosophers is incapable of disjoining his ego from those bodily feelings and images which form the incessant background of his awareness of himself. The notion of his ego as such is, like every notion, derived from sensibility, for the process of apperception itself comes to our knowledge chiefly through those feelings of tension [what I have above called inward adjustments] which accompany it." (Physiologische Psychologie, 2te Aufl. Bd. ii, pp. 217-19.)

- [262] The only exception I know of is M. J. Souriau, in his important article in the *Revue Philosophique*, vol. xxi, p. 449. M. Souriau's conclusion is 'que la conscience n'existe pas' (p. 472).
- [263] See the excellent remarks by Prof. Bain on the 'Emotion of Power' in his 'Emotions and the Will.'
- [264] Cf. Carlyle: *Sartor Resartus*, 'The Everlasting Yea.' "I tell thee, blockhead, it all comes of thy vanity; of what thou fanciest those same deserts of thine to be. Fancy that thou deservest to be hanged (as is most likely), thou wilt feel it happiness to be only shot: fancy that thou deservest to be hanged in a hair halter, it will be a luxury to die in hemp.... What act of legislature was there that *thou* shouldst be happy? A little while ago thou hadst no right to *be* at all." etc., etc.
- [265] T. W. Higginson's translation (1866), p. 105.
- [266] "The usual mode of lessening the shock of disappointment or disesteem is to contract, if possible, a low estimate of the persons that inflict it. This is our remedy for the unjust censures of party spirit, as well as of personal malignity." (Bain: *Emotion and Will*, p. 209.)
- [267] It must be observed that the qualities of the Self thus ideally constituted are all qualities approved by my actual fellows in the first instance; and that my reason for now appealing from their verdict to that of the ideal judge lies in some outward peculiarity of the immediate case. What once was admired in me as courage has now become in the eyes of men 'impertinence'; what was fortitude is obstinacy; what was fidelity is now fanaticism. The ideal judge alone, I now believe, can read my qualities, my willingnesses, my powers, for what they truly are. My fellows, misled by interest and prejudice, have gone astray.
- [268] The *kind* of selfishness varies with the self that is sought. If it be the mere bodily self; if a man grabs the best food, the warm corner, the vacant seat; if he makes room for no one, spits about, and belches in our faces,—we call it hoggishness. If it be the social self, in the form of popularity or influence, for which he is greedy, he may in material ways subordinate himself to others as the best means to his end; and in this case he is very apt to pass for a disinterested man. If it be the 'other-worldly' self which he seeks, and if he seeks it ascetically,—even though he would rather see all mankind damned eternally than lose his individual soul,—'saintliness' will probably be the name by which his selfishness will be called.
- [269] Lotze, *Med. Psych.* 498-501; *Microcosmos*, bk. ii, chap. v, §§ 3, 4.
- [270] *Psychologische Analysen auf Physiologischer Grundlage*. Theil ii, 2te Hälfte, § 11. The whole section ought to be read.
- [271] Professor Bain, in his chapter on 'Emotions of Self,' does scant justice to the primitive nature of a large part of our self-feeling, and seems to reduce it to reflective self-estimation of this sober intellectual sort, which certainly *most* of it is not. He says that when the attention is turned inward upon self as a Personality, "we are putting forth towards ourselves the kind of exercise that properly accompanies our contemplation of other persons. We are accustomed to scrutinize the actions and conduct of those about us, to set a higher *value* upon one man than upon another, by comparing the two; to *pity* one in distress; to feel *complacency*

towards a particular individual; to *congratulate* a man on some good fortune that it pleases us to see him gain; to *admire* greatness or excellence as displayed by any of our fellows. All these exercises are intrinsically social, like Love and Resentment; an isolated individual could never attain to them, nor exercise them. By what means, then, through what fiction [!] can we turn round and play them off upon self? Or how comes it that we obtain any satisfaction by putting self in the place of the other party? Perhaps the simplest form of the reflected act is that expressed by Self-worth and Self-estimation, based and begun upon observation of the ways and conduct of our fellow-beings. We soon make comparisons among the individuals about us; we see that one is stronger and does more work than another, and, in consequence perhaps, receives more pay. We see one putting forth perhaps more kindness than another, and in consequence receiving more love. We see some individuals surpassing the rest in astonishing feats, and drawing after them the gaze and admiration of a crowd. We acquire a series of fixed associations towards persons so situated; favorable in the case of the superior, and unfavorable to the inferior. To the strong and laborious man we attach an estimate of greater reward, and feel that to be in his place would be a happier lot than falls to others. Desiring, as we do, from the primary motives of our being, to possess good things, and observing these to come by a man's superior exertions, we feel a respect for such exertion and a wish that it might be ours. We know that we also put forth exertions for our share of good things; and on witnessing others, we are apt to be reminded of ourselves and to make comparisons with ourselves, which comparisons derive their interest from the substantial consequences. Having thus once learned to look at other persons as performing labors, greater or less, and as realizing fruits to accord; being, moreover, in all respects like our fellows,—we find it an exercise neither difficult nor unmeaning to contemplate self as doing work and receiving the reward.... As we decide between one man and another,—which is worthier,... so we decide between self and all other men; being, however, in this decision under the bias of our own desires." A couple of pages farther on we read: "By the terms Self-complacency. Self-gratulation, is indicated a positive enjoyment in dwelling upon our own merits and belongings. As in other modes, so here, the starting point is the contemplation of excellence or pleasing qualities *in another person*, accompanied more or less with fondness or love." Self-pity is also regarded by Professor Bain, in this place, as an emotion diverted to ourselves from a more immediate object, "in a manner that we may term fictitious and unreal. Still, as we can view self in the light of another person, we can feel towards it the emotion of pity called forth by others in our situation."

This account of Professor Bain's is, it will be observed, a good specimen of the old-fashioned mode of explaining the several emotions as rapid calculations of results, and the transfer of feeling from one object to another, associated by contiguity or similarity with the first. Zoological evolutionism, which came up since Professor Bain first wrote, has made us see, on the contrary, that many emotions must be *primitively* aroused by special objects. None are more worthy of being ranked primitive than the self-gratulation and humiliation attendant on our own successes and failures in the main functions of life. We need no borrowed reflection for these feelings. Professor Bain's account applies to but that small fraction of our self-feeling which reflective criticism can add to, or subtract from, the total mass.—Lotze has some pages on the modifications of our self-regard by universal judgments, in *Microcosmus*, book v, chap. v, § 5.

[272] "Also nur dadurch, dass ich ein Mannigfaltiges gegehener Vorstellungen in *einem Bewusstsein* verbinden kann, ist es möglich dass ich die *Identität des Bewusstseins* in diesen *Vorstellungen* selbst vorstelle, d. h. die analytische Einheit der Apperception ist nur unter der Voraussetzung irgend einer synthetischen möglich." In this passage (Kritik der reinen Vernunft, 2te Aufl. § 16) Kant calls by the names of analytic and synthetic apperception what we here mean by objective and subjective synthesis respectively. It were much to be desired that some one

might invent a good pair of terms in which to record the distinction—those used in the text are certainly very bad, but Kant's seem to me still worse. 'Categorical unity' and 'transcendental synthesis' would also be good Kantian, but hardly good human, speech.

- [273] So that we might say, by a sort of bad pun, "only a connected world can be known as disconnected." I say bad pun, because the point of view shifts between the connectedness and the disconnectedness. The disconnectedness is of the realities known; the connectedness is of the knowledge of them; and reality and knowledge of it are, from the psychological point of view held fast to in these pages, two different facts.
- [274] Some subtle reader will object that the Thought cannot call any part of its Object 'I' and knit other parts on to it, without first knitting that part on to *Itself*; and that it cannot knit it on to *Itself* without knowing *Itself*;—so that our supposition (above, [p. 304](#)) that the Thought may conceivably have no immediate knowledge of *Itself* is thus overthrown. To which the reply is that we must take care not to be duped by words. The words *I* and *me* signify nothing mysterious and unexampled—they are at bottom only names of *emphasis*; and Thought is always emphasizing something. Within a tract of space which it cognizes, it contrasts a *here* with a *there*; within a tract of time a *now* with a *then*; of a pair of things it calls one *this*, the other *that*. *I* and *thou*, *I* and *it*, are distinctions exactly on a par with these,—distinctions possible in an exclusively *objective* field of knowledge, the 'I' meaning for the Thought nothing but the bodily life which it momentarily feels. The sense of my bodily existence, however obscurely recognized as such, *may* then be the absolute original of my conscious selfhood, the fundamental perception that *I am*. All appropriations *may* be made *to it*, *by* a Thought not at the moment immediately cognized by itself. Whether these are not only logical possibilities but actual facts is something not yet dogmatically decided in the text.
- [275] Metaphysik, § 245 *fin*. This writer, who in his early work, the Medizinische Psychologie, was (to my reading) a strong defender of the Soul-Substance theory, has written in §§ 243-5 of his Metaphysik the most beautiful criticism of this theory which exists.
- [276] On the empirical and transcendental conceptions of the self's unity, see Lotze, Metaphysic, § 244.
- [277] Appendix to book i of Hume's Treatise on Human Nature.
- [278] Herbart believed in the Soul, too; but for him the 'Self' of which we are 'conscious' is the empirical Self—not the soul.
- [279] Compare again the remarks on [pp. 158-162](#) above.
- [280] System of Psychology (1884). vol. i, p. 114.
- [281] 'Distinct only to *observation*,' he adds. To whose observation? the outside psychologist's, the Ego's, their own, or the plank's? *Darauf kommt es an!*
- [282] Analysis, etc., J. S. Mill's Edition, vol. i, p. 331. The 'as it were' is delightfully characteristic of the school.
- [283] J. Mill's Analysis, vol. ii, p. 175.
- [284] Examination of Hamilton. 4th ed. p. 263.
- [285] His chapter on the Psychological Theory of Mind is a beautiful case in point, and his concessions there have become so celebrated that they must be quoted for the reader's benefit. He ends the chapter with these words (*loc. cit.* p. 247): "The theory, therefore, which resolves Mind into a series of feelings, with a background of possibilities of feeling, can effectually withstand the most invidious of the arguments directed against it. But groundless as are the extrinsic objections, the theory has intrinsic difficulties which we have not set forth, and which it seems to me beyond the power of metaphysical analysis to remove...."

"The thread of consciousness which composes the mind's phenomenal life consist not only of present sensations, but likewise, in part, of memories and expectations. Now what are these? In themselves, they are present feelings, states of present consciousness, and in that respect not distinguished from sensations. They all, moreover, resemble some given sensations or feelings, of which we have previously had experience. But they are attended with the peculiarity that each of them involves a belief in more than its own present existence. A sensation involves only this; but a remembrance of sensation, even if not referred to any particular date, involves the suggestion and belief that a sensation, of which it is a copy or representation, actually existed in the past; and an expectation involves the belief, more or less positive, that a sensation or other feeling to which it directly refers will exist in the future. Nor can the phenomena involved in these two states of consciousness be adequately expressed, without saying that the belief they include is, that I myself formerly had, or that I myself, and no other, shall hereafter have, the sensations remembered or expected. The fact believed is, that the sensations did actually form, or will hereafter form, part of the self-same series of states, or thread of consciousness, of which the remembrance or expectation of those sensations is the part now present. If, therefore, we speak of the mind as a series of feelings we are obliged to complete the statement by calling it a series of feelings which is aware of itself as past and future; and we are reduced to the alternative of believing that the mind, or Ego, is something different from any series of feelings, or possibilities of them, or of accepting the paradox that something which *ex hypothesi* is but a series of feelings, can be aware of itself as a series.

"The truth is, that we are here face to face with that final inexplicability, at which, as Sir W. Hamilton observes, we inevitably arrive when we reach ultimate facts; and in general, one mode of stating it only appears more incomprehensible than another, because the whole of human language is accommodated to the one, and is so incongruous with the other that it cannot be expressed in any terms which do not deny its truth. The real stumbling-block is perhaps not in any theory of the fact, but in the fact itself. The true incomprehensibility perhaps is, that something which has ceased, or is not yet in existence, can still be, in a manner, present; that a series of feelings, the infinitely greater part of which is past or future, can be gathered up, as it were, into a simple present conception, accompanied by a belief of reality. I think by far the wisest thing we can do is to accept the inexplicable fact, without any theory of how it takes place; and when we are obliged to speak of it in terms which assume a theory, to use them with a reservation as to their meaning."

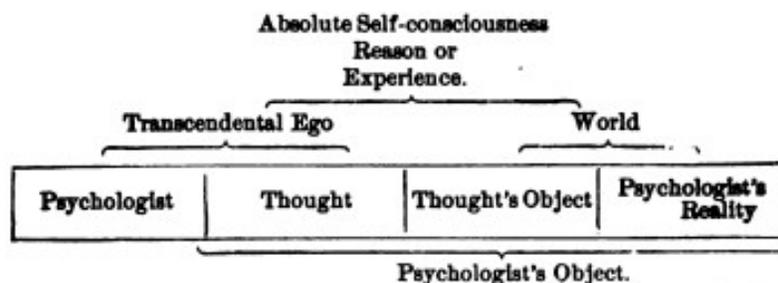
In a later place in the same book (p. 561) Mill, speaking of what may rightly be demanded of a theorist, says: "He is not entitled to frame a theory from one class of phenomena, extend it to another class which it does not fit, and excuse himself by saying that if we cannot make it fit, it is because ultimate facts are inexplicable." The class of phenomena which the associationist school takes to frame its theory of the Ego are feelings unaware of each other. The class of phenomena the Ego presents are feelings of which the later ones are intensely aware of those that went before. The two classes do not 'fit,' and no exercise of ingenuity can ever make them fit. No *shuffling* of unaware feelings can make them aware. To get the awareness we must openly beg it by postulating a new feeling which has it. This new feeling is no 'Theory' of the phenomena, but a simple statement of them; and as such I postulate in the text the present passing Thought as a psychic integer, with its knowledge of so much that has gone before.

[286] Kritik d. reinen Vernunft, 2te Aufl. § 17.

[287] It must be noticed, in justice to what was said above on [page 274](#) ff., that neither Kant nor his successors anywhere discriminate between the *presence* of the apperceiving Ego to the combined object, and the *awareness by* that Ego of its

own presence and of its distinctness from what it apperceives. That the Object must be known to something which *thinks*, and that it must be known to something which *thinks that it thinks*, are treated by them as identical necessities, —by what logic, does not appear. Kant tries to soften the jump in the reasoning by saying the thought *of itself* on the part of the Ego need only be *potential*—"the 'I think' must *be capable* of accompanying all other knowledge"—but a thought which is only potential is actually no thought at all, which practically gives up the case.

- [288] "As regards the soul, now, or the 'I,' the 'thinker,' the whole drift of Kant's advance upon Hume and sensational psychology is towards the demonstration that the subject of knowledge is an *Agent*." (G. S. Morris, *Kant's Critique*, etc. (Chicago, 1882), p. 224.)
- [289] "In Kant's Prolegomena," says H. Cohen,—I do not myself find the passage,—"it is expressly said that the problem is not to show how experience arises (ensteht), but of what it consists (besteht)." (Kant's *Theorie d. Erfahrung* (1871), p. 138.)
- [290] The contrast between the Monism thus reached and our own psychological point of view can be exhibited schematically thus, the terms in squares standing for what, for us, are the ultimate irreducible data of psychological science, and the vincula above it symbolizing the reductions which post-Kantian idealism performs:



These reductions account for the ubiquitousness of the 'psychologist's fallacy' (bk. ii, ch. i, p. 32) in the modern monistic writings. For *us* it is an unpardonable logical sin, when talking of a thought's knowledge (either of an object or of itself), to change the terms without warning, and, substituting the psychologist's knowledge therefor, still make as if we were continuing to talk of the same thing. For monistic idealism, this is the very enfranchisement of philosophy, and of course cannot be too much indulged in.

- [291] T. H. Green, *Prolegomena to Ethics*, §§ 57, 61, 64.
- [292] *Loc. cit.* § 64.
- [293] E. Caird: Hegel (1883), p. 149.
- [294] One is almost tempted to believe that the pantomime-state of mind and that of the Hegelian dialectics are, emotionally considered, one and the same thing. In the pantomime all common things are represented to happen in impossible ways, people jump down each other's throats, houses turn inside out, old women become young men, everything 'passes into its opposite' with inconceivable celerity and skill; and this, so far from producing perplexity, brings rapture to the beholder's mind. And so in the Hegelian logic, relations elsewhere recognized under the insipid name of distinctions (such as that between knower and object, many and one) must first be translated into impossibilities and contradictions, then 'transcended' and identified by miracle, ere the proper temper is induced for thoroughly enjoying the spectacle they show.
- [295] The reader will please understand that I am quite willing to leave the hypothesis of the transcendental Ego as a substitute for the passing Thought open to discussion on *general speculative grounds*. Only *in this book* I prefer to stick by

the common sense assumption that we have successive conscious states, because all psychologists make it, and because one does not see how there can be a Psychology written which does not postulate such thoughts as its ultimate data. The data of all natural sciences become in turn subjects of a critical treatment more refined than that which the sciences themselves accord; and so it may fare in the end with our passing Thought. We have ourselves seen ([pp. 299-305](#)) that the *sensible* certainty of its existence is less strong than is usually assumed. My quarrel with the transcendental Egoists is mainly about their *grounds* for their belief. Did they consistently propose it as a *substitute* for the passing Thought, did they consistently *deny the latter's existence*, I should respect their position more. But so far as I can understand them, they habitually believe in the passing Thought also. They seem even to believe in the Lockian stream of separate ideas, for the chief glory of the Ego in their pages is always its power to 'overcome' this separateness and unite the naturally disunited, '*synthetizing*,' '*connecting*,' or '*relating*' the ideas together being used as synonyms, by transcendentalist writers, for *knowing various objects at once*. Not the being conscious at all, but the being conscious of *many things together* is held to be the difficult thing, in our psychic life, which only the wonder-working Ego can perform. But on what slippery ground does one get the moment one changes the definite notion of *knowing an object* into the altogether vague one of *uniting or synthetizing the ideas* of its various parts!—In the chapter on Sensation we shall come upon all this again.

[296] "When we compare the listless inactivity of the infant, slumbering from the moment at which he takes his milky food to the moment at which he wakes to require it again, with the restless energies of that mighty being which he is to become in his maturer years, pouring truth after truth, in rapid and dazzling profusion, upon the world, or grasping in his single hand the destiny of empires, how few are the circumstances of resemblance which we can trace, of all that intelligence which is afterwards to be displayed; how little more is seen than what serves to give feeble motion to the mere machinery of life!... Every age, if we may speak of many ages in the few years of human life, seems to be marked with a distinct character. Each has its peculiar objects which excite lively affections; and in each, exertion is excited by affections, which in other periods terminate without inducing active desire. The boy finds a world in less space than that which bounds his visible horizon; he wanders over his range of field and exhausts his strength in the pursuit of objects which, in the years that follow, are seen only to be neglected; while to him the objects that are afterwards to absorb his whole soul are as indifferent as the objects of his present passions are destined then to appear.... How many opportunities must every one have had of witnessing the progress of intellectual decay, and the coldness that steals upon the once benevolent heart! We quit our country, perhaps at an early period of life, and after an absence of many years we return with all the remembrances of past pleasure which grow more tender as they approach their objects. We eagerly seek him to whose paternal voice we have been accustomed to listen with the same reverence as if its predictions had possessed oracular certainty,—who first led us into knowledge, and whose image has been constantly joined in our mind with all that veneration which does not forbid love. We find him sunk, perhaps, in the imbecility of idiotism, unable to recognize us,—ignorant alike of the past and of the future, and living only in the sensibility of animal gratification. We seek the favorite companion of our childhood, whose tenderness of heart, etc.... We find him hardened into a man, meeting us scarcely with the cold hypocrisy of dissembled friendship—in his general relations to the world careless of the misery *he* is not to feel.... When we observe all this,... do we use only a metaphor of little meaning when we say of him that he is become a different person, and that his mind and character are changed? In what does the identity consist?... The supposed test of identity, when applied to the mind in these cases, completely fails. It neither affects, nor is affected, in the same manner in the same circumstances. It therefore, if the test be a just one, is not the same identical

mind." (T. Brown: Lectures on the Philosophy of the Human Mind, 'on Mental Identity.')

- [297] "Sir John Cutler had a pair of black worsted stockings, which his maid darned so often with silk that they became at last a pair of silk stockings. Now, supposing these stockings of Sir John's endued with some degree of consciousness at every particular darning, they would have been sensible that they were the same individual pair of stockings both before and after the darning; and this sensation would have continued in them through all the succession of darnings; and yet after the last of all, there was not perhaps one thread left of the first pair of stockings: but they were grown to be silk stockings, as was said before." (Pope's *Martinus Scriblerus*, quoted by Brown, *ibid.*)
- [298] Hours of Work and Play, p. 100.
- [299] For a careful study of the errors in narratives, see E. Gurney: Phantasms of the Living, vol. i, pp. 126-158. In the Proceedings of the Society for Psychological Research for May 1887 Mr. Richard Hodgson shows by an extraordinary array of instances how utterly inaccurate everyone's description from memory of a rapid series of events is certain to be.
- [300] See Josiah Royce (*Mind*, vol. 13, p. 244, and *Proceedings of Am. Soc. of Psych. Research*, vol. i, p. 366), for evidence that a certain sort of hallucination of memory which he calls 'pseudo-presentiment' is no uncommon phenomenon.
- [301] *Maladies de la Mémoire*, p. 85. The little that would be left of personal consciousness if *all* our senses stopped their work is ingenuously shown in the remark of the extraordinary anæsthetic youth whose case Professor Strümpell reports (in the *Deutsches Archiv f. klin. Med.*, xxii, 847, 1878). This boy, whom we shall later find instructive in many connections, was totally anæsthetic without and (so far as could be tested) within, save for the sight of one eye and the hearing of one ear. When his eye was closed, he said: "*Wenn ich nicht sehen kann, da BIN ich gar nicht*—I no longer *am*."
- [302] "One can compare the state of the patient to nothing so well as to that of a caterpillar, which, keeping all its caterpillar's ideas and remembrances, should suddenly become a butterfly with a butterfly's senses and sensations. Between the old and the new state, between the first self, that of the caterpillar, and the second self, that of the butterfly, there is a deep scission, a complete rupture. The new feelings find no anterior series to which they can knit themselves on; the patient can neither interpret nor use them; he does not recognize them; they are unknown. Hence two conclusions, the first which consists in his saying, *I no longer am*; the second, somewhat later, which consists in his saying, *I am another person*." (H. Taine: *de l'Intelligence*, 3me édition (1878), p. 462).
- [303] W. Griesinger: *Mental Diseases*, § 29.
- [304] See the interesting case of 'old Stump' in the *Proceedings of the Am. Soc. for Psych. Research*, p. 552.
- [305] *De l'Intelligence*, 3me édition (1878), vol. ii, note, p. 461. Krishaber's book (*La Névropathie Cérébro-cardiaque*, 1873) is full of similar observations.
- [306] Sudden alterations in outward fortune often produce such a change in the empirical *me* as almost to amount to a pathological disturbance of self-consciousness. When a poor man draws the big prize in a lottery, or unexpectedly inherits an estate; when a man high in fame is publicly disgraced, a millionaire becomes a pauper, or a loving husband and father sees his family perish at one fell swoop, there is temporarily such a rupture between all past habits, whether of an active or a passive kind, and the exigencies and possibilities of the new situation, that the individual may find no medium of continuity or association to carry him over from the one phase to the other of his life. Under these conditions mental derangement is no unfrequent result.

- [307] The number of subjects who can do this with any fertility and exuberance is relatively quite small.
- [308] First in the *Revue Scientifique* for May 26, 1876, then in his book, *Hypnotisme, Double Conscience, et Altérations de la Personnalité* (Paris, 1887).
- [309] *Der Hypnotismus* (1884), pp. 109-15.
- [310] Transactions of the College of Physicians of Philadelphia, April 4, 1888. Also, less complete, in *Harper's Magazine*, May 1860.
- [311] Cf. Ribot's *Diseases of Memory* for cases. See also a large number of them in Forbes Winslow's *Obscure Diseases of the Brain and Mind*, chapters xiii-xvii.
- [312] See the interesting account by M. J. Janet in the *Revue Scientifique*, May 19, 1888.
- [313] *Variations de la Personnalité* (Paris, 1888).
- [314] *Op. cit.* p. 84. In this work and in Dr. Azam's (cited on a previous page), as well as in Prof. Th. Ribot's *Maladies de la Personnalité* (1885), the reader will find information and references relative to the other known cases of the kind.
- [315] His own brother's subject Wit...., although in her anæsthetic waking state she recollected nothing of either of her trances, yet remembered her deeper trance (in which her sensibilities became perfect—see above, [p. 207](#)) when she was in her lighter trance. Nevertheless in the latter she was as anæsthetic as when awake. (*Loc. cit.* p. 619.)—It does not appear that there was any important difference in the sensibility of Félicité X. between her two states—as far as one can judge from M. Azam's account she was to some degree anæsthetic in both (*op. cit.* pp. 71, 96).—In the case of double personality reported by M. Dufay (*Revue Scientifique*, vol. xviii, p. 69), the memory seems to have been best in the more anæsthetic condition.—Hypnotic subjects made blind do not necessarily lose their visual ideas. It appears, then, both that amnesias may occur without anæsthesias, and anæsthesias without amnesias, though they may also occur in combination. Hypnotic subjects made blind by suggestion will tell you that they clearly imagine the things which they can no longer see.
- [316] A full account of the case, by Mr. R. Hodgson, will be found in the Proceedings of the Society for Psychical Research for 1891.
- [317] He had spent an afternoon in Boston, a night in New York, an afternoon in Newark, and ten days or more in Philadelphia, first in a certain hotel and next in a certain boarding-house, making no acquaintances, 'resting,' reading, and 'looking round.' I have unfortunately been unable to get independent corroboration of these details, as the hotel registers are destroyed, and the boarding-house named by him has been pulled down. He forgets the name of the two ladies who kept it.
- [318] The details of the case, it will be seen, are all *compatible* with simulation. I can only say of that, that no one who has examined Mr. Bourne (including Dr. Read, Dr. Weir Mitchell, Dr. Guy Hinsdale, and Mr. R. Hodgson) practically doubts his ingrained honesty, nor, so far as I can discover, do any of his personal acquaintances indulge in a sceptical view.
- [319] *The Watseka Wonder*, by E. W. Stevens. Chicago, Religio-Philosophical Publishing House, 1887.
- [320] My friend Mr. R. Hodgson informs me that he visited Watseka in April 1890, and cross-examined the principal witnesses of this case. His confidence in the original narrative was strengthened by what he learned; and various unpublished facts were ascertained, which increased the plausibility of the spiritualistic interpretation of the phenomenon.
- [321] See his highly important series of articles on Automatic Writing, etc., in the Proceedings of the Soc. for Psych. Research, especially Article ii (May 1885).

Compare also Dr. Maudsley's instructive article in *Mind*, vol. xiv, p. 161, and Luys's essay, 'Sur le Dédoublément,' etc., in *l'Encéphale* for 1889.

CHAPTER XI.

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ATTENTION.

Strange to say, so patent a fact as the perpetual presence of selective attention has received hardly any notice from psychologists of the English empiricist school. The Germans have explicitly treated of it, either as a faculty or as a resultant, but in the pages of such writers as Locke, Hume, Hartley, the Mills, and Spencer the word hardly occurs, or if it does so, it is parenthetically and as if by inadvertence.^[322] The motive of this ignoring of the phenomenon of attention is obvious enough. These writers are bent on showing how the higher faculties of the mind are pure products of 'experience;' and experience is supposed to be of something simply *given*. Attention, implying a degree of reactive spontaneity, would seem to break through the circle of pure receptivity which constitutes 'experience,' and hence must not be spoken of under penalty of interfering with the smoothness of the tale.

But the moment one thinks of the matter, one sees how false a notion of experience that is which would make it tantamount to the mere presence to the senses of an outward order. Millions of items of the outward order are present to my senses which never properly enter into my experience. Why? Because they have no *interest* for me. *My experience is what I agree to attend to*. Only those items which I *notice* shape my mind—without selective interest, experience is an utter chaos. Interest alone gives accent and emphasis, light and shade, background and foreground—intelligible perspective, in a word. It varies in every creature, but without it the consciousness of every creature would be a gray chaotic indiscriminateness, impossible for us even to conceive. Such an empiricist writer as Mr. Spencer, for example, regards the creature as absolutely passive clay, upon which 'experience' rains down. The clay will be impressed most deeply where the drops fall thickest, and so the final shape of the mind is moulded. Give time enough, and all sentient things ought, at this rate, to end by assuming an identical mental constitution—for 'experience,' the sole shaper, is a constant fact, and the order of its items must end by being exactly reflected by the passive mirror which we call the sentient organism. If such an account were true, a race of dogs bred for generations, say in the Vatican, with characters of visual shape, sculptured in marble, presented to their eyes, in every variety of form and combination, ought to discriminate before long the finest shades of these peculiar characters. In a word, they ought to become, if time were given, accomplished *connoisseurs* of sculpture. Anyone may judge of the probability of this consummation. Surely an eternity of experience of the statues would leave the dog as inartistic as he was at first, for the lack of an original interest to knit his discriminations on to. Meanwhile the odors at the bases of the pedestals would have organized themselves in the consciousness of this breed of dogs into a system of 'correspondences' to which the most hereditary caste of *custodi* would never approximate, merely because to them, as human beings, the dog's interest in those smells would for ever be an inscrutable mystery. These writers have, then, utterly ignored the glaring fact that subjective interest may, by laying its weighty index-finger on particular items of experience, so accent them as to give to the least frequent associations far more power to shape our thought than the most frequent ones possess. The interest itself, though its genesis is doubtless perfectly *natural*, *makes* experience more than it is made by it.

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Every one knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others, and is a condition which has a real opposite in the confused, dazed, scatter-brained state which in French is called *distraction*, and *Zerstreutheit* in German.

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We all know this latter state, even in its extreme degree. Most people probably fall several times a day into a fit of something like this: The eyes are fixed on vacancy, the sounds of the world melt into confused unity, the attention is dispersed so that the whole body is felt, as it were, at once, and the foreground of consciousness is filled, if by anything, by a sort of solemn sense of surrender to the empty passing of time. In the dim background of our mind we know meanwhile what we ought to be doing: getting up, dressing ourselves, answering the person who has spoken to us, trying to make the next step in our reasoning. But somehow we cannot *start*; the *pensée de derrière la tête* fails to pierce the shell of lethargy that wraps our state about. Every moment we expect the spell to break, for we know no reason why it should continue. But it does continue, pulse after pulse, and we float with it, until—also without reason that we can discover—an energy is given, something—we know not what—enables us to gather ourselves together, we wink our eyes, we shake our heads, the background-ideas become effective, and the wheels of life go round again.

This curious state of inhibition can for a few moments be produced at will by fixing the eyes on vacancy. Some persons can voluntarily empty their minds and 'think of nothing.' With many, as Professor Exner remarks of himself, this is the most efficacious means of falling asleep. It is difficult not to suppose something like this scattered condition of mind to be the usual state of brutes when not actively engaged in some pursuit. Fatigue, monotonous mechanical occupations that end by being automatically carried on, tend to produce it in men. It is not sleep; and yet when aroused from such a state, a person will often hardly be able to say what he has been thinking about. Subjects of the hypnotic trance seem to lapse into it when left to themselves; asked what they are thinking of, they reply, 'of nothing particular'!^[323]

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The abolition of this condition is what we call the awakening of the attention. One principal object comes then into the focus of consciousness, others are temporarily suppressed. The awakening may come about either by reason of a stimulus from without, or in consequence of some unknown inner alteration; and the change it brings with it amounts to a concentration upon one single object with exclusion of aught besides, or to a condition anywhere between this and the completely dispersed state.

TO HOW MANY THINGS CAN WE ATTEND AT ONCE?

The question of the '*span*' of *consciousness* has often been asked and answered—sometimes *a priori*, sometimes by experiment. This seems the proper place for us to touch upon it; and our answer, according to the principles laid down in [Chapter IX](#), will not be difficult. The number of *things* we may attend to is altogether indefinite, depending on the power of the individual intellect, on the form of the apprehension, and on what the things are. When apprehended conceptually as a connected system, their number may be very large. But however numerous the things, they can only be known in a single pulse of consciousness for which they form one complex 'object' (p. 276 ff.), so that properly speaking there is before the mind at no time a plurality of *ideas*, properly so called.

The 'unity of the soul' has been supposed by many philosophers, who also believed in the distinct atomic nature of 'ideas,' to preclude the presence to it of more than one objective fact, manifested in one idea, at a time. Even Dugald Stuart opines that every *minimum visibile* of a pictured figure

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"constitutes just as distinct an object of attention to the mind as if it were separated by an interval of empty space from the rest.... It is impossible for the mind to attend to more than one of these points at once; and as the perception of the figure implies a knowledge of the relative situation of the different points with respect to each other, we must conclude that the perception of figure by the eye is the result of a number of different acts of attention. These acts of attention, however, are performed with such rapidity, that the effect, with respect to us, is the same as if the perception were instantaneous."^[324]

Such glaringly artificial views can only come from fantastic metaphysics or from the ambiguity of the word 'idea,' which, standing sometimes for mental state and sometimes for thing known, leads men to ascribe to the thing, not only the unity which belongs to the mental state, but even the simplicity which is thought to reside in the Soul.

When the things are apprehended by the *senses*, the number of them that can be attended to at once is small, "*Pluribus intentus, minor est ad singula sensus.*"

"By Charles Bonnet the Mind is allowed to have a distinct notion of six objects at once; by Abraham Tucker the number is limited to four; while Destutt Tracy again amplifies it to six. The opinion of the first and last of these philosophers" [continues Sir Wm. Hamilton] "seems to me correct. You can easily make the experiments for yourselves, but you must beware of grouping the objects into classes. If you throw a handful of marbles on the floor, you will find it difficult to view at once more than six, or seven at most, without confusion; but if you group them into twos, or threes, or fives, you can comprehend as many groups as you can units; because the mind considers these groups only as units—it views them as wholes, and throws their parts out of consideration."^[325]

Professor Jevons, repeating this observation, by counting instantaneously beans thrown into a box, found that the number 6 was guessed correctly 120 times out of 147, 5 correctly 102 times out of 107, and 4 and 3 always right.^[326] It is obvious that such observations decide nothing at all about our attention, properly so called. They rather measure in part the distinctness of our vision—especially of the primary-memory-image^[327]—in part the amount of association in the individual between seen arrangements and the names of numbers.^[328]

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Each number-name is a way of grasping the beans as one total object. In such a total object, all the parts converge harmoniously to the one resultant concept; no single bean has special discrepant associations of its own; and so, with *practice*, they may grow quite numerous ere we fail to estimate them aright. But where the 'object' before us breaks into parts disconnected with each other, and forming each as it were a separate object or system, not conceivable in union with the rest, it becomes harder to apprehend all these parts at once, and the mind tends to let go of one whilst it attends to another. Still, within limits this can be done. M. Paulhan has experimented carefully on the matter by declaiming one poem aloud whilst he repeated a different one mentally, or by writing one sentence whilst speaking another, or by performing calculations on paper whilst reciting poetry.^[329] He found that

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"the most favorable condition for the doubling of the mind was its simultaneous application to two easy and heterogeneous operations. Two operations of the same sort, two multiplications, two recitations, or the reciting one poem and writing another, render the process more uncertain and difficult."

The attention often, but not always, oscillates during these performances; and sometimes a word from one part of the task slips into another. I myself find when I try to simultaneously

recite one thing and write another that the beginning of each word or segment of a phrase is what requires the attention. Once started, my pen runs on for a word or two as if by its own momentum. M. Paulhan compared the time occupied by the same two operations done simultaneously or in succession, and found that there was often a considerable gain of time from doing them simultaneously. For instance:

"I write the first four verses of *Athalie*, whilst reciting eleven of Musset. The whole performance occupies 40 seconds. But reciting alone takes 22 and writing alone 31, or 53 altogether, so that there is a difference in favor of the simultaneous operations."

Or again:

"I multiply 421 312 212 by 2; the operation takes 6 seconds; the recitation of 4 verses also takes 6 seconds. But the two operations done at once only take 6 seconds, so that there is no loss of time from combining them."

Of course these time-measurements lack precision. With three systems of object (writing with *each* hand whilst reciting) the operation became much more difficult.

If, then, by the original question, how many ideas or things can we attend to at once, be meant how many entirely disconnected systems or processes of conception can go on simultaneously, the answer is, *not easily more than one, unless the processes are very habitual; but then two, or even three*, without very much oscillation of the attention. Where, however, the processes are less automatic, as in the story of Julius Cæsar dictating four letters whilst he writes a fifth,^[330] there must be a rapid oscillation of the mind from one to the next, and no consequent gain of time. Within any one of the systems the parts may be numberless, but we attend to them collectively when we conceive the whole which they form. [Pg 409]

When the things to be attended to are small sensations, and when the effort is to be exact in noting them, it is found that attention to one interferes a good deal with the perception of the other. A good deal of fine work has been done in this field, of which I must give some account.

It has long been noticed, when expectant attention is concentrated upon one of two sensations, that the other one is apt to be displaced from consciousness for a moment and to appear subsequent; although in reality the two may have been contemporaneous events. Thus, to use the stock example of the books, the surgeon would sometimes see the blood flow from the arm of the patient whom he was bleeding, *before* he saw the instrument penetrate the skin. Similarly the smith may see the sparks fly *before* he sees the hammer smite the iron, etc. There is thus a certain difficulty in perceiving the exact *date* of two impressions when they do not interest our attention equally, and when they are of a disparate sort.

Professor Exner, whose experiments on the *minimal perceptible succession* in time of two sensations we shall have to quote in another chapter, makes some noteworthy remarks about the way in which the attention must be *set* to catch the interval and the right order of the sensations, when the time is exceeding small. The point was to tell whether two signals were simultaneous or successive; and, if successive, which one of them came first. [Pg 410]

The first way of attending which he found himself to fall into, was when the signals did not differ greatly—when, e.g., they were similar sounds heard each by a different ear. Here he lay in wait for the *first* signal, whichever it might be, and identified it the next moment in

memory. The second, which could then always be known by default, was often not clearly distinguished in itself. When the time was too short, the first could not be isolated from the second at all.

The second way was to accommodate the attention for a certain *sort* of signal, and the next moment to become aware in memory of whether it came before or after its mate.

"This way brings great uncertainty with it. The impression not prepared for comes to us in the memory more weak than the other, obscure as it were, badly fixed in time. We tend to take the subjectively stronger stimulus, that which we were intent upon, for the first, just as we are apt to take an objectively stronger stimulus to be the first. Still, it may happen otherwise. In the experiments from touch to sight it often seemed to me as if the impression for which the attention was *not* prepared were there already when the other came."

Exner found himself employing this method oftenest when the impressions differed strongly.^[331]

In such observations (which must not be confounded with those where the two signals were identical and their successiveness known as mere *doubleness*, without distinction of which came first), it is obvious that each signal must combine stably in our perception with a *different* instant of time. It is the simplest possible case of two discrepant concepts simultaneously occupying the mind. Now the case of the signals being *simultaneous* seems of a different sort. We must turn to Wundt for observations fit to cast a nearer light thereon.

The reader will remember the reaction-time experiments of which we treated in [Chapter III](#). It happened occasionally in Wundt's experiments that the reaction-time was reduced to zero or even assumed a negative value, which, being translated into common speech, means that the observer was sometimes so intent upon the signal that his reaction *actually coincided in time with it, or even preceded it*, instead of coming a fraction of a second after it, as in the nature of things it should. More will be said of these results anon. Meanwhile Wundt, in explaining them, says this:

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"In general we have a very exact feeling of the simultaneity of two stimuli, if they do not differ much in strength. And in a series of experiments in which a warning precedes, at a fixed interval, the stimulus, we involuntarily try to react, not only as promptly as possible, but also in such wise that our movement may coincide with the stimulus itself. We seek to make our own feelings of touch and innervation [muscular contraction] objectively *contemporaneous with the signal* which we hear; and experience shows that in many cases we approximately succeed. In these cases we have a distinct consciousness of hearing the signal, reacting upon it, and feeling our reaction take place,—all at one and the same moment."^[332]

In another place, Wundt adds:

"The difficulty of these observations and the comparative infrequency with which the reaction-time can be made thus to disappear shows how hard it is, when our attention is intense, to keep it fixed even on *two* different ideas at once. Note besides that when this happens, one always tries to bring the ideas into a certain connection, to grasp them as components of a certain complex representation. Thus in the experiments in question, it has often seemed to me that I produced by my own recording movement the sound which the ball made in dropping on the board."^[333]

The 'difficulty,' in the cases of which Wundt speaks, is that of forcing two non-simultaneous events into apparent combination with the same instant of time. There is no difficulty, as he admits, in so dividing our attention between two *really* simultaneous impressions as to feel them to be such. The cases he describes are really cases of anachronistic perception, of subjective time-displacement, to use his own term. Still more curious cases of it have been most carefully studied by him. They carry us a step farther in our research, so I will quote them, using as far as possible his exact words:

"The conditions become more complicated when we receive a series of impressions separated by distinct intervals, into the midst of which a heterogeneous impression is suddenly brought. Then comes the question, with which member of the series do we perceive the additional impression to coincide? with that member with whose presence it really coexists, or is there some aberration?... If the additional stimulus belongs to a different sense very considerable aberrations may occur.

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"The best way to experiment is with a number of visual impressions (which one can easily get from a moving object) for the series, and with a sound as the disparate impression. Let, e.g., an index-hand move over a circular scale with uniform and sufficiently slow velocity, so that the impressions it gives will not fuse, but permit its position at any instant to be distinctly seen. Let the clockwork which turns it have an arrangement which rings a bell once in every revolution, but at a point which can be varied, so that the observer need never know in advance just when the bell-stroke takes place. In such observations three cases are possible. The bell-stroke can be perceived either exactly at the moment to which the index points when it sounds—in this case there will be no time-displacement; or we can combine it with a later position of the index—... *positive time-displacement*, as we shall call it; or finally we can combine it with a position of the index earlier than that at which the sound occurred—and this we will call a *negative displacement*. The most natural displacement would apparently be the positive, since for apperception a certain time is always required.... But experience shows that the opposite is the case: it happens most frequently that the sound appears earlier than its real date—far less often coincident with it, or later. It should be observed that in all these experiments it takes some time to get a distinctly perceived combination of the sound with a particular position of the index, and that a single revolution of the latter is never enough for the purpose. The motion must go on long enough for the sounds themselves to form a regular series—the outcome being a simultaneous perception of two distinct series of events, of which either may by changes in its rapidity modify the result. The first thing one remarks is that the sound belongs in a certain region of the scale; only gradually is it perceived to combine with a particular position of the index. But even a result gained by observation of many revolutions may be deficient in certainty, for accidental combinations of attention have a great influence upon it. If we deliberately try to combine the bell-stroke with an arbitrarily chosen position of the index, we succeed without difficulty, provided this position be not too remote from the true one. If, again, we cover the whole scale, except a single division over which we may see the index pass, we have a strong tendency to combine the bell-stroke with this actually seen position; and in so doing may easily overlook more than 1/4 of a second of time. Results, therefore, to be of any value, must be drawn from long-continued and very numerous observations, in which such irregular oscillations of the attention neutralize each other according to the law of great numbers, and allow the true laws to appear. Although my own experiments extend over many years (with interruptions), they are not even yet

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numerous enough to exhaust the subject—still, they bring out the principal laws which the attention follows under such conditions."^[334]

Wundt accordingly distinguishes the *direction* from the *amount* of the apparent displacement in time of the bell-stroke. The direction depends on the rapidity of the movement of the index and (consequently) on that of the succession of the bell-strokes. The moment at which the bell struck was estimated by him with the least tendency to error, when the revolutions took place once in a second. Faster than this, *positive* errors began to prevail; slower, *negative* ones almost always were present. On the other hand, if the rapidity went *quicken*ing, errors became *negative*; if *slow*ing, *positive*. The amount of error is, in general, the greater the slower the speed and its alterations. Finally, individual differences prevail, as well as differences in the same individual at different times.^[335]

Wundt's pupil von Tschisch has carried out these experiments on a still more elaborate scale, ^[Pg 414]
^[336] using, not only the single bell-stroke, but 2, 3, 4, or 5 simultaneous impressions, so that the attention had to note the place of the index at the moment when a whole group of things was happening. The single bell-stroke was always heard too early by von Tschisch—the displacement was invariably 'negative.' As the other simultaneous impressions were added, the displacement first became zero and finally positive, i.e. the impressions were connected with a position of the index that was too late. This retardation was greater when the simultaneous impressions were disparate (electric tactile stimuli on different places, simple touch-stimuli, different sounds) than when they were all of the same sort. The increment of retardation became relatively less with each additional impression, so that it is probable that six impressions would have given almost the same result as five, which was the maximum number used by Herr von T.

Wundt explains all these results by his previous observation that a reaction sometimes antedates the signal (see above, [p. 411](#)). The mind, he supposes, is so intent upon the bell-strokes that its 'apperception' keeps ripening periodically after each stroke in anticipation of the next. Its most natural rate of ripening may be faster or slower than the rate at which the strokes come. If faster, then it hears the stroke too early; if slower, it hears it too late. The position of the index on the scale, meanwhile, is noted at the moment, early or late, at which the bell-stroke is subjectively heard. Substituting several impressions for the single bell-stroke makes the ripening of the perception slower, and the index is seen too late. So, at least, do I understand the explanations which Herren Wundt and v. Tschisch give.^[337] ^[Pg 415]

This is all I have to say about the difficulty of having two discrepant concepts together, and about the number of things to which we can simultaneously attend. ^[Pg 416]

THE VARIETIES OF ATTENTION.

The things to which we attend are said to *interest* us. Our interest in them is supposed to be the *cause* of our attending. What makes an object interesting we shall see presently; and later inquire in what sense interest may cause attention. Meanwhile

Attention may be divided into kinds in various ways. It is either to

- a) Objects of sense (sensorial attention); or to
- b) Ideal or represented objects (intellectual attention). It is either
- c) Immediate; or
- d) Derived: immediate, when the topic or stimulus is interesting in itself, without relation to anything else; derived, when it owes its interest to association with some other immediately interesting thing. What I call derived attention has been named 'apperceptive' attention. Furthermore, Attention may be either

e) Passive, reflex, non-voluntary, effortless; or

f) Active and voluntary.

Voluntary attention is always derived; we never make an *effort* to attend to an object except for the sake of some *remote* interest which the effort will serve. But both sensorial and intellectual attention may be either passive or voluntary.

In *passive immediate sensorial attention* the stimulus is a sense-impression, either very intense, voluminous, or sudden,—in which case it makes no difference what its nature may be, whether sight, sound, smell, blow, or inner pain,—or else it is an *instinctive* stimulus, a perception which, by reason of its nature rather than its mere force, appeals to some one of our normal congenital impulses and has a directly exciting quality. In the chapter on Instinct we shall see how these stimuli differ from one animal to another, and what most of them are in man: strange things, moving things, wild animals, bright things, pretty things, metallic things, words, blows, blood, etc., etc., etc.

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Sensitiveness to immediately exciting sensorial stimuli characterizes the attention of childhood and youth. In mature age we have generally selected those stimuli which are connected with one or more so-called permanent interests, and our attention has grown irresponsive to the rest.^[338] But childhood is characterized by great active energy, and has few organized interests by which to meet new impressions and decide whether they are worthy of notice or not, and the consequence is that extreme mobility of the attention with which we are all familiar in children, and which makes their first lessons such rough affairs. Any strong sensation whatever produces accommodation of the organs which perceive it, and absolute oblivion, for the time being, of the task in hand. This reflex and passive character of the attention which, as a French writer says, makes the child seem to belong less to himself than to every object which happens to catch his notice, is the first thing which the teacher must overcome. It never is overcome in some people, whose work, to the end of life, gets done in the interstices of their mind-wandering.

The passive sensorial attention is *derived* when the impression, without being either strong or of an instinctively exciting nature, is connected by previous experience and education with things that are so. These things may be called the *motives* of the attention. The impression draws an interest from them, or perhaps it even fuses into a single complex object with them; the result is that it is brought into the focus of the mind. A faint tap *per se* is not an interesting sound; it may well escape being discriminated from the general rumor of the world. But when it is a signal, as that of a lover on the window-pane, it will hardly go unperceived. Herbart writes:

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"How a bit of bad grammar wounds the ear of the purist! How a false note hurts the musician! or an offence against good manners the man of the world! How rapid is progress in a science when its first principles have been so well impressed upon us that we reproduce them mentally with perfect distinctness and ease! How slow and uncertain, on the other hand, is our learning of the principles themselves, when familiarity with the still more elementary percepts connected with the subject has not given us an adequate predisposition!—Apperceptive attention may be plainly observed in very small children when, hearing the speech of their elders, as yet unintelligible to them, they suddenly catch a single known word here and there, and repeat it to themselves; yes! even in the dog who looks round at us when we speak of him and pronounce his name. Not far removed is the talent which mind-wandering school-boys display during the hours of instruction, of noticing every moment in which the teacher tells a story. I remember classes in which, instruction being uninteresting, and discipline relaxed, a buzzing murmur was always to be heard, which invariably stopped for as long a time as an anecdote lasted. How could the boys, since they seemed to hear nothing, notice when the anecdote began? Doubtless most of

them always heard something of the teacher's talk; but most of it had no connection with their previous knowledge and occupations, and therefore the separate words no sooner entered their consciousness than they fell out of it again; but, on the other hand, no sooner did the words awaken old thoughts, forming strongly-connected series with which the new impression easily combined, than out of new and old together a total interest resulted which drove the vagrant ideas below the threshold of consciousness, and brought for a while settled attention into their place."^[339]

Passive intellectual attention is immediate when we follow in thought a train of images exciting or interesting *per se*; derived, when the images are interesting only as means to a remote end, or merely because they are associated with something which makes them dear. Owing to the way in which immense numbers of real things become integrated into single objects of thought for us, there is no clear line to be drawn between immediate and derived attention of an intellectual sort. When absorbed in intellectual attention we may become so inattentive to outer things as to be 'absent-minded,' 'abstracted,' or '*distracts*.' All revery or concentrated meditation is apt to throw us into this state.

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"Archimedes, it is well known, was so absorbed in geometrical meditation that he was first aware of the storming of Syracuse by his own death-wound, and his exclamation on the entrance of the Roman soldiers was: *Noli turbare circulos meos!* In like manner Joseph Scaliger, the most learned of men, when a Protestant student in Paris, was so engrossed in the study of Homer that he became aware of the massacre of St. Bartholomew, and of his own escape, only on the day subsequent to the catastrophe. The philosopher Carneades was habitually liable to fits of meditation so profound that, to prevent him sinking from inanition, his maid found it necessary to feed him like a child. And it is reported of Newton that, while engaged in his mathematical researches, he sometimes forgot to dine. Cardan, one of the most illustrious of philosophers and mathematicians, was once, upon a journey, so lost in thought that he forgot both his way and the object of his journey. To the questions of his driver whether he should proceed, he made no answer; and when he came to himself at nightfall, he was surprised to find the carriage at a standstill, and directly under a gallows. The mathematician Vieta was sometimes so buried in meditation that for hours he bore more resemblance to a dead person than to a living, and was then wholly unconscious of everything going on around him. On the day of his marriage the great Budæus forgot everything in his philological speculations, and he was only awakened to the affairs of the external world by a tardy embassy from the marriage-party, who found him absorbed in the composition of his *Commentarii*."^[340]

The absorption may be so deep as not only to banish ordinary sensations, but even the severest pain. Pascal, Wesley, Robert Hall, are said to have had this capacity. Dr. Carpenter says of himself that

"he has frequently begun a lecture whilst suffering neuralgic pain so severe as to make him apprehend that he would find it impossible to proceed; yet no sooner has he by a determined effort fairly launched himself into the stream of thought, than he has found himself continuously borne along without the least distraction, until the end has come, and the attention has been released; when the pain has recurred with a force that has overmastered all resistance, making him wonder how he could have ever ceased to feel it."^[341]

Dr. Carpenter speaks of launching himself by a determined *effort*. This effort characterizes what we called *active or voluntary attention*. It is a feeling which every one knows, but which most people would call quite indescribable. We get it in the sensorial sphere whenever we seek to catch an impression of extreme *faintness*, be it of sight, hearing, taste, smell, or touch; we get it whenever we seek to *discriminate* a sensation merged in a mass of others that are similar; we get it whenever we *resist the attractions* of more potent stimuli and keep our mind occupied with some object that is naturally unimpressive. We get it in the intellectual sphere under exactly similar conditions: as when we strive to sharpen and make distinct an idea which we but vaguely seem to have; or painfully discriminate a shade of meaning from its similars; or resolutely hold fast to a thought so discordant with our impulses that, if left unaided, it would quickly yield place to images of an exciting and impassioned kind. All forms of attentive effort would be exercised at once by one whom we might suppose at a dinner-party resolutely to listen to a neighbor giving him insipid and unwelcome advice in a low voice, whilst all around the guests were loudly laughing and talking about exciting and interesting things.

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There is no such thing as voluntary attention sustained for more than a few seconds at a time. What is called sustained voluntary attention is a repetition of successive efforts which bring back the topic to the mind.^[342] The topic once brought back, if a congenial one, *develops*; and if its development is interesting it engages the attention passively for a time. Dr. Carpenter, a moment back, described the stream of thought, once entered, as 'bearing him along.' This passive interest may be short or long. As soon as it flags, the attention is diverted by some irrelevant thing, and then a voluntary effort may bring it back to the topic again; and so on, under favorable conditions, for hours together. During all this time, however, note that it is not an identical *object* in the psychological sense (p. 275), but a succession of mutually related objects forming an identical *topic* only, upon which the attention is fixed. *No one can possibly attend continuously to an object that does not change.*

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Now there are always some objects that for the time being *will not develop*. They simply *go out*; and to keep the mind upon anything related to them requires such incessantly renewed effort that the most resolute Will ere long gives out and lets its thoughts follow the more stimulating solicitations after it has withstood them for what length of time it can. There are topics known to every man from which he shies like a frightened horse, and which to get a glimpse of is to shun. Such are his ebbing assets to the spendthrift in full career. But why single out the spendthrift when to every man actuated by passion the thought of interests which negate the passion can hardly for more than a fleeting instant stay before the mind? It is like 'memento mori' in the heyday of the pride of life. Nature rises at such suggestions, and excludes them from the view:—How long, O healthy reader, can you now continue thinking of your tomb?—In milder instances the difficulty is as great, especially when the brain is fagged. One snatches at any and every passing pretext, no matter how trivial or external, to escape from the odiousness of the matter in hand. I know a person, for example, who will poke the fire, set chairs straight, pick dust-specks from the floor, arrange his table, snatch up the newspaper, take down any book which catches his eye, trim his nails, waste the morning *anyhow*, in short, and all without premeditation,—simply because the only thing he *ought* to attend to is the preparation of a noonday lesson in formal logic which he detests. Anything but *that!*

Once more, the object must change. When it is one of sight, it will actually become invisible; when of hearing, inaudible,—if we attend to it too unmovingly. Helmholtz, who has put his sensorial attention to the severest tests, by using his eyes on objects which in common life are expressly overlooked, makes some interesting remarks on this point in his chapter on retinal rivalry.^[343] The phenomenon called by that name is this, that if we look with each eye upon a different picture (as in the annexed stereoscopic slide), sometimes one

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picture, sometimes the other, or parts of both, will come to consciousness, but hardly ever both combined. Helmholtz now says:

"I find that I am able to attend voluntarily, now to one and now to the other system of lines; and that then this system remains visible alone for a certain time, whilst the other completely vanishes. This happens, for example, whenever I try to count the lines first of one and then of the other system.... But it is extremely hard to chain the attention down to one of the systems for long, unless we associate with our looking some distinct purpose which keeps the activity of the attention perpetually renewed. Such a one is counting the lines, comparing their intervals, or the like. An equilibrium of the attention, persistent for any length of time, is under no circumstances attainable. The natural tendency of attention when left to itself is to wander to ever new things; and so soon as the interest of its object is over, so soon as nothing new is to be noticed there, it passes, in spite of our will, to something else. If we wish to keep it upon one and the same object, we must seek constantly to find out something new about the latter, especially if other powerful impressions are attracting us away."

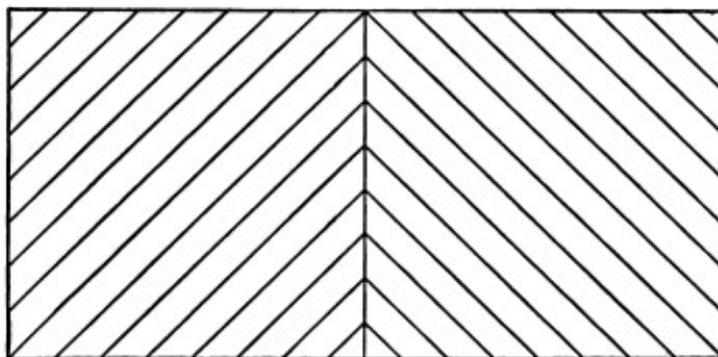


FIG. 36.

And again criticising an author who had treated of attention as an activity absolutely subject to the conscious will, Helmholtz writes:

"This is only restrictedly true. We move our eyes by our will; but one without training cannot so easily execute the intention of making them converge. At any moment, however, he can execute that of looking at a near object, in which act convergence is involved. Now just as little can we carry out our purpose to keep our attention steadily fixed upon a certain object, when our interest in the object is exhausted, and the purpose is inwardly formulated in this abstract way. *But we can set ourselves new questions about the object, so that a new interest in it arises, and then the attention will remain riveted.* The relation of attention to will is, then, less one of immediate than of mediate control."

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These words of Helmholtz are of fundamental importance. And if true of sensorial attention, how much more true are they of the intellectual variety! The *conditio sine quâ non* of sustained attention to a given topic of thought is that we should roll it over and over incessantly and consider different aspects and relations of it in turn. Only in pathological states will a fixed and ever monotonously recurring idea possess the mind.

And now we can see why it is that what is called sustained attention is the easier, the richer in acquisitions and the fresher and more original the mind. In such minds, subjects bud and

sprout and grow. At every moment, they please by a new consequence and rivet the attention afresh. But an intellect unfurnished with materials, stagnant, unoriginal, will hardly be likely to consider any subject long. A glance exhausts its possibilities of interest. Geniuses are commonly believed to excel other men in their power of sustained attention. [344] In most of them, it is to be feared, the so-called 'power' is of the passive sort. Their ideas coruscate, every subject branches infinitely before their fertile minds, and so for hours they may be rapt. *But it is their genius making them attentive, not their attention making geniuses of them.* And, when we come down to the root of the matter, we see that they differ from ordinary men less in the character of their attention than in the nature of the objects upon which it is successively bestowed. In the genius, these form a concatenated series, suggesting each other mutually by some rational law. Therefore we call the attention 'sustained' and the topic of meditation for hours 'the same.' In the common man the series is for the most part incoherent, the objects have no rational bond, and we call the attention wandering and unfixd.

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It is probable that genius tends actually to prevent a man from acquiring habits of voluntary attention, and that moderate intellectual endowments are the soil in which we may best expect, here as elsewhere, the virtues of the will, strictly so called, to thrive. But, whether the attention come by grace of genius or by dint of will, the longer one does attend to a topic the more mastery of it one has. And the faculty of voluntarily bringing back a wandering attention, over and over again, is the very root of judgment, character, and will. No one is *compos sui* if he have it not. An education which should improve this faculty would be *the education par excellence*. But it is easier to define this ideal than to give practical directions for bringing it about. The only general pedagogic maxim bearing on attention is that the more interest the child has in advance in the subject, the better he will attend. Induct him therefore in such a way as to knit each new thing on to some acquisition already there; and if possible awaken curiosity, so that the new thing shall seem to come as an answer, or part of an answer, to a question pre-existing in his mind.

At present having described the varieties, let us turn to

THE EFFECTS OF ATTENTION.

Its remote effects are too incalculable to be recorded. The practical and theoretical life of whole species, as well as of individual beings, results from the selection which the habitual direction of their attention involves. In [Chapters XIV](#) and [XV](#) some of these consequences will come to light. Suffice it meanwhile that each of us literally *chooses*, by his ways of attending to things, what sort of a universe he shall appear to himself to inhabit.

The immediate effects of attention are to make us:

- a) perceive—
- b) conceive—
- c) distinguish—
- d) remember—

better than otherwise we could—both more successive things and each thing more clearly. It also

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- (e) shortens 'reaction-time.'
-

a and *b*. Most people would say that a sensation attended to becomes stronger than it otherwise would be. This point is, however, not quite plain, and has occasioned some discussion.^[345] From the strength or intensity of a sensation must be distinguished its clearness; and to increase *this* is, for some psychologists, the utmost that attention can do. When the facts are surveyed, however, it must be admitted that to some extent the relative intensity of two sensations may be changed when one of them is attended to and the other not. Every artist knows how he can make a scene before his eyes appear warmer or colder in color, according to the way he sets his attention. If for warm, he soon begins to *see* the red color start out of everything; if for cold, the blue. Similarly in listening for certain notes in a chord, or overtones in a musical sound, the one we attend to sounds probably a little more loud as well as more emphatic than it did before. When we mentally break a series of monotonous strokes into a rhythm, by accentuating every second or third one, etc., the stroke on which the stress of attention is laid seems to become stronger as well as more emphatic. The increased visibility of optical after-images and of double images, which close attention brings about, can hardly be interpreted otherwise than as a real strengthening of the retinal sensations themselves. And this view is rendered particularly probable by the fact that an imagined visual object may, if attention be concentrated upon it long enough, acquire before the mind's eye almost the brilliancy of reality, and (in the case of certain exceptionally gifted observers) leave a negative after-image of itself when it passes away (see Chapter XVIII). Confident expectation of a certain intensity or quality of impression will often make us sensibly see or hear it in an object which really falls far short of it. In face of such facts it is rash to say that attention cannot make a sense-impression more intense.

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But, on the other hand, the intensification which may be brought about seems never to lead the judgment astray. As we rightly perceive and name the same color under various lights, the same sound at various distances; so we seem to make an analogous sort of allowance for the varying amounts of attention with which objects are viewed; and whatever changes of feeling the attention may bring we charge, as it were, to the attention's account, and still perceive and conceive the object as the same.

"A gray paper appears to us no lighter, the pendulum-beat of a clock no louder, no matter how much we increase the strain of our attention upon them. No one, by doing this, can make the gray paper look white, or the stroke of the pendulum sound like the blow of a strong hammer,—everyone, on the contrary, feels the increase as that of his own conscious activity turned upon the thing."

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Were it otherwise, we should not be able to note *intensities* by attending to them. Weak impressions would, as Stumpf says,^[347] become stronger by the very fact of being observed.

"I should not be able to observe faint sounds at all, but only such as appeared to me of maximal strength, or at least of a strength that increased with the amount of my observation. In reality, however, I can, with steadily increasing attention, follow a diminuendo perfectly well."

The subject is one which would well repay exact experiment, if methods could be devised. Meanwhile there is no question whatever that attention augments the *clearness* of all that we perceive or conceive by its aid. But what is meant by clearness here?

c. Clearness, so far as attention produces it, *means distinction from other things and internal analysis or subdivision*. These are essentially products of intellectual *discrimination*,

involving comparison, memory, and perception of various relations. The attention *per se* does not distinguish and analyze and relate. The most we can say is that it is a condition of our doing so. And as these processes are to be described later, the clearness they produce had better not be farther discussed here. The important point to notice here is that it is not attention's *immediate* fruit.^[348]

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d. Whatever future conclusion we may reach as to this, we cannot deny that *an object once attended to will remain in the memory*, whilst one inattentively allowed to pass will leave no traces behind. Already in Chapter VI (see [pp. 163 ff.](#)) we discussed whether certain states of mind were 'unconscious,' or whether they were not rather states to which no attention had been paid, and of whose passage recollection could afterwards find no vestiges. Dugald Stewart says:^[349] "The connection between attention and memory has been remarked by many authors." He quotes Quintilian, Locke, and Helvetius; and goes on at great length to explain the phenomena of 'secondary automatism' (see above, [p. 114 ff.](#)) by the presence of a mental action grown so inattentive as to preserve no memory of itself. In our chapter on Memory, later on, the point will come up again.

e) Under this head, the *shortening of reaction-time*, there is a good deal to be said of Attention's effects. Since Wundt has probably worked over the subject more thoroughly than any other investigator and made it peculiarly his own, what follows had better, as far as possible, be in his words. The reader will remember the method and results of experimentation on 'reaction-time,' as given in [Chapter III](#).

The facts I proceed to quote may also be taken as a supplement to that chapter. Wundt writes:

"When we wait with strained attention for a stimulus, it will often happen that instead of registering the stimulus, we react upon some entirely different impression,—and this not through confounding the one with the other. On the contrary, we are perfectly well aware at the moment of making the movement that we respond to the wrong stimulus. Sometimes even, though not so often, the latter may be another kind of sensation altogether,—one may, for example, in experimenting with sound, register a flash of light, produced either by accident or design. We cannot well explain these results otherwise than by assuming that the strain of the attention towards the impression we expect coexists with a preparatory innervation of the motor centre for the reaction, which innervation the slightest shock then suffices to turn into an actual discharge. This shock may be given by any chance impression, even by one to which we never intended to respond. When the preparatory innervation has once reached this pitch of intensity, the time that intervenes between the stimulus and the contraction of the muscles which react, may become vanishingly small."^[350]

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"The perception of an impression is facilitated when the impression is preceded by a warning which announces beforehand that it is about to occur. This case is realized whenever several stimuli follow each other at equal intervals,—when, e.g. we note pendulum movements by the eye, or pendulum-strokes by the ear. Each single stroke forms here the signal for the next, which is thus met by a fully prepared attention. The same thing happens when the stimulus to be

perceived is preceded, at a certain interval, by a single warning: the time is always notably shortened.... I have made comparative observations on reaction-time with and without a warning signal. The impression to be reacted on was the sound made by the dropping of a ball on the board of the 'drop apparatus.'... In a first series no warning preceded the stroke of the ball; in the second, the noise made by the apparatus in liberating the ball served as a signal.... Here are the averages of two series of such experiments:

Height of Fall.		Average.	Mean Error.	No. of Expts.
25 cm.	No warning	0.253	0.051	13
	Warning	0.076	0.060	17
5 cm.	No warning	0.266	0.036	14
	Warning	0.175	0.035	17

"... In a long series of experiments, (the interval between warning and stimulus remaining the same) the reaction-time grows less and less, and it is possible occasionally to reduce it to a vanishing quantity (a few thousandths of a second), to zero, or even to a negative value.^[351]... The only ground that we can assign for this phenomenon is *the preparation (vorbereitende Spannung) of the attention*. It is easy to understand that the reaction-time should be shortened by this means; but that it should sometimes sink to zero and even assume negative values, may appear surprising. Nevertheless this latter case is also explained by what happens in the simple reaction-time experiments" just referred to, in which, "when the strain of the attention has reached its climax, the movement we stand ready to execute escapes from the control of on will, and we register a wrong signal. In these other experiments, in which a warning foretells the moment of the stimulus, it is also plain that attention accommodates itself so exactly to the latter's reception that *no sooner is it objectively given than it is fully apperceived, and with the apperception the motor discharge coincides.*"^[352]

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Usually, when the impression is fully anticipated, attention prepares the motor centres so completely for both stimulus and reaction that the only time lost is that of the physiological conduction downwards. But even this interval may disappear, i.e. the stimulus and reaction may become objectively contemporaneous; or more remarkable still, the reaction may be discharged before the stimulus has actually occurred.^[353] Wundt, as we saw some pages back (p. 411), explains this by the effort of the mind so to react that we may feel our own movement and the signal which prompts it, both at the same instant. As the execution of the movement must precede our feeling of it, so it must also precede the stimulus, if that and our movement are to be felt at once.

The peculiar theoretic interest of these experiments lies in their *showing expectant attention and sensation to be continuous or identical processes, since they may have identical motor effects*. Although other exceptional observations show them likewise to be continuous *subjectively*, Wundt's experiments do not: he seems never, at the moment of reacting prematurely, to have been misled into the belief that the real stimulus was there.

As concentrated attention accelerates perception, so, conversely, perception of a stimulus is *retarded by anything which either baffles or distracts the attention* with which we await it.

"If, e.g., we make reactions on a sound in such a way that weak and strong stimuli irregularly alternate so that the observer can never expect a determinate strength with any certainty, the reaction-time for *all* the various signals is increased,—and so is the average error. I append two examples.... In Series I a

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strong and a weak sound alternated regularly, so that the intensity was each time known in advance. In II they came irregularly.

I. *Regular Alternation.*

	Average Time.	Average Error.	No. of Expts.
Strong sound	0.116"	0.010"	18
Weak sound	0.127"	0.012"	9

II. *Irregular Alternation.*

Strong sound	0.189"	0.038"	9
Weak sound	0.298"	0.076"	15

"Still greater is the increase of the time when, unexpectedly into a series of strong impressions, a weak one is interpolated, or *vice versâ*. In this way I have seen the time of reaction upon a sound so weak as to be barely perceived rise to 0.4" or 0.5", and for a strong sound to 0.25". It is also matter of general experience that a stimulus expected in a general way, but for whose intensity attention cannot be adapted in advance, demands a longer reaction-time. In such cases ... the reason for the difference can only lie in the fact that wherever a preparation of the attention is impossible, the time of both perception and volition is prolonged. Perhaps also the conspicuously large reaction-times which are got with stimuli so faint as to be just perceptible may be explained by the attention tending always to adapt itself for something more than this minimal amount of stimulus, so that a state ensues similar to that in the case of unexpected stimuli.... Still more than by previously unknown stimuli is the reaction-time prolonged by *wholly unexpected* impressions. This is sometimes accidentally brought about, when the observer's attention, instead of being concentrated on the coming signal, is dispersed. It can be realized purposely by suddenly thrusting into a long series of equidistant stimuli a much shorter interval which the observer does not expect. The mental effect here is like that of being startled;—often the startling is outwardly visible. The time of reaction may then easily be lengthened to one quarter of a second with strong signals, or with weak ones to a half-second. Slighter, but still very noticeable, is the retardation when the experiment is so arranged that the observer, ignorant whether the stimulus is to be an impression of light, sound, or touch, cannot keep his attention turned to any particular sense-organ in advance. One notices then at the same time a peculiar unrest, as the feeling of strain which accompanies the attention keeps vacillating between the several senses.

"Complications of another sort arise when what is registered is an impression anticipated both in point of quality and strength, but accompanied by other stimuli which make the concentration of the attention difficult. The reaction-time is here always more or less prolonged. The simplest case of the sort is where a momentary impression is registered in the midst of another, and continuous, sensorial-stimulation of considerable strength. The continuous stimulus may belong to the same sense as the stimulus to be reacted on, or to another. When it is of the same sense, the retardation it causes may be partly due to the distraction of the attention by it, but partly also to the fact that the stimulus to be reacted on stands out less strongly than if alone, and practically becomes a less intense sensation. But other factors in reality are present; for we find the reaction-time more prolonged by the concomitant stimulation when the stimulus is weak than when it is strong I made experiments in which the principal impression, or signal for reaction, was a bell-stroke whose strength could be graduated by a spring against the hammer with a movable counterpoise. Each set of observations comprised two series; in one of which the bell-stroke was registered in the ordinary way, whilst in the other a toothed

wheel belonging to the chronometric apparatus made during the entire experiment a steady noise against a metal spring. In one half of the latter series (A) the bell-stroke was only moderately strong, so that the accompanying noise diminished it considerably, without, however, making it indistinguishable. In the other half (B) the bell-sound was so loud as to be heard with perfect distinctness above the noise.

		Mean.	Maximum.	Minimum.	No. of Experiments.
A (Bell-stroke moderate)	Without noise	0.189	0.214	0.156	21
	With noise	0.313	0.499	0.183	16
B (Bell-stroke loud)	Without noise	0.158	0.206	0.133	20
	With noise	0.203	0.295	0.140	19

"Since, in these experiments, the sound B even with noise made a considerably stronger impression than the sound A without, we must see in the figures a direct influence of the disturbing noise on the process of reaction. This influence is freed from mixture with other factors when the momentary stimulus and the concomitant disturbance appeal to different senses. I chose, to test this, sight and hearing. The momentary signal was an induction-spark leaping from one platinum point to another against a dark background. The steady stimulation was the noise above described.

Spark.	Mean.	Maximum.	Minimum.	No. of Expts.
Without noise	0.222	0.284	0.158	20
With noise	0.300	0.390	0.250	18

"When one reflects that in the experiments with one and the same sense the relative intensity of the signal is always depressed [which by itself is a retarding condition] the amount of retardation in these last observations makes it probable that *the disturbing influence upon attention is greater when the stimuli are disparate than when they belong to the same sense*. One does not, in fact, find it particularly hard to register immediately, when the bell rings in the midst of the noise; but when the spark is the signal one has a feeling of being coerced, as one turns away from the noise towards it. This fact is immediately connected with other properties of our attention. The effort of the latter is accompanied by various corporeal sensations, according to the sense which is engaged. The innervation which exists during the effort of attention is therefore probably a different one for each sense-organ."^[354]

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Wundt then, after some theoretical remarks which we need not quote now, gives a table of retardations, as follows:

	Retardation.
1. Unexpected strength of impression:	
a) Unexpectedly strong sound	0.073
b) Unexpectedly weak sound	0.171
2. Interference by like stimulus (sound by sound)	0.045 ^[355]
3. Interference by unlike stimulus (light by sound)	0.078

It seems probable, from these results obtained with elementary processes of mind, that all processes, even the higher ones of reminiscence, reasoning, etc., whenever attention is

concentrated upon them instead of being diffused and languid, are thereby more rapidly performed.^[356]

Still more interesting reaction-time observations have been made by Münsterberg. The reader will recollect the fact noted in Chapter III (p. 93) that reaction-time is shorter when one concentrates his attention on the expected movement than when one concentrates it on the expected signal. Herr Münsterberg found that this is equally the case when the reaction is no simple reflex, but can take place only after an intellectual operation. In a series of experiments the five fingers were used to react with, and the reactor had to use a different finger according as the signal was of one sort or another. Thus when a word in the nominative case was called out he used the thumb, for the dative he used another finger; similarly adjectives, substantives, pronouns, numerals, etc., or, again, towns, rivers, beasts, plants, elements; or poets, musicians, philosophers, etc., were co-ordinated each with its finger, so that when a word belonging to either of these classes was mentioned, a particular finger and no other had to perform the reaction. In a second series of experiments the reaction consisted in the utterance of a word in answer to a question, such as "name an edible fish," etc.; or "name the first drama of Schiller," etc.; or "which is greater, Hume or Kant?" etc.; or (first naming apples and cherries, and several other fruits) "which do you prefer, apples or cherries?" etc.; or "which is Goethe's finest drama?" etc.; or "which letter comes the later in the alphabet, the letter L or the first letter of the most beautiful tree?" etc.; or "which is less, 15 or 20 minus 8?"^[357] etc. etc. etc. Even in this series of reactions *the time was much quicker taken the reactor turned his attention in advance towards the answer than when he turned it towards the question.* The shorter reaction-time was seldom more than one fifth of a second; the longer, from four to eight times as long.

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To understand such results, one must bear in mind that in these experiments the reactor always knew in advance in a general way the *kind* of question which he was to receive, and consequently the *sphere within which* his possible answer lay.^[358] In turning his attention, therefore, from the outset towards the answer, those brain-processes in him which were connected with this entire 'sphere' were kept sub-excited, and the question could then discharge with a minimum amount of lost time that particular answer out of the 'sphere' which belonged especially to it. When, on the contrary, the attention was kept looking towards the question exclusively and averted from the possible reply, all this preliminary sub-excitement of motor tracts failed to occur, and the entire process of answering had to be gone through with *after* the question was heard. No wonder that the time was prolonged. It is a beautiful example of the summation of stimulations, and of the way in which expectant attention, even when not very strongly focalized, will prepare the motor centres, and shorten the work which a stimulus has to perform on them, in order to produce a given effect when it comes.

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THE INTIMATE NATURE OF THE ATTENTIVE PROCESS.

We have now a sufficient number of facts to warrant our considering this more recondite question. And two physiological processes, of which we have got a glimpse, immediately suggest themselves as possibly forming in combination a complete reply. I mean

1. *The accommodation or adjustment of the sensory organs;* and
2. *The anticipatory preparation from within of the ideational centres concerned with the object to which the attention is paid.*

1. The sense-organs and the bodily muscles which favor their exercise are adjusted most energetically in sensorial attention, whether immediate and reflex, or derived. But there are good grounds for believing that even intellectual attention, attention to the *idea* of a sensible object, is also accompanied with some degree of excitement of the sense-organs to which the object appeals. The preparation of the ideational centres exists, on the other hand, wherever our interest in the object—be it sensible or ideal—is *derived* from, or in any way connected with, other interests, or the presence of other objects, in the mind. It exists as well when the attention thus derived is classed as passive as when it is classed as voluntary. So that on the whole we may confidently conclude—since in mature life we never attend to anything without our interest in it being in some degree derived from its connection with other objects—that *the two processes of sensorial adjustment and ideational preparation probably coexist in all our concrete attentive acts.*

The two points must now be proved in more detail. First, as respects the sensorial adjustment. [Pg 435]

That it is present when we attend to *sensible* things is obvious. When we look or listen we accommodate our eyes and ears involuntarily, and we turn our head and body as well; when we taste or smell we adjust the tongue, lips, and respiration to the object; in feeling a surface we move the palpatory organ in a suitable way; in all these acts, besides making involuntary muscular contractions of a positive sort, we inhibit others which might interfere with the result—we close the eyes in tasting, suspend the respiration in listening, etc. The result is a more or less massive organic feeling that attention is going on. This organic feeling comes, in the way described on [page 302](#), to be contrasted with that of the objects which it accompanies, and regarded as peculiarly ours, whilst the objects form the not-me. We treat it as a sense of our *own activity*, although it comes in to us from our organs after they are accommodated, just as the feeling of any object does. Any object, if *immediately* exciting, causes a reflex accommodation of the sense-organ, and this has two results—first, the object's increase in clearness; and second, the feeling of activity in question. Both are sensations of an 'afferent' sort.

But in *intellectual* attention, as we have already seen, ([p. 300](#)), similar feelings of activity occur. Fechner was the first, I believe, to analyze these feelings, and discriminate them from the stronger ones just named. He writes:

"When we transfer the attention from objects of one sense to those of another, we have an indescribable feeling (though at the same time one perfectly determinate, and reproducible at pleasure), of altered *direction* or differently localized tension (*Spannung*). We feel a strain forward in the eyes, one directed sidewise in the ears, increasing with the degree of our attention, and changing according as we look at an object carefully, or listen to something attentively; and we speak accordingly of *straining the attention*. The difference is most plainly felt when the attention oscillates rapidly between eye and ear; and the feeling localizes itself with most decided difference in regard to the various sense-organs, according as we wish to discriminate a thing delicately by touch, taste, or smell.

"But now I have, when I try to vividly recall a picture of memory or fancy, a feeling perfectly analogous to that which I experience when I seek to apprehend a thing keenly by eye or ear; and this analogous feeling is very differently localized. While in sharpest possible attention to real objects (as well as to after-images) the strain is plainly forwards, and when the attention changes from one sense to another only alters its direction between the several external sense-organs, leaving the rest of the head free from strain, the case is different in memory or fancy, for here the feeling withdraws entirely from the external sense-organs, and seems rather to take refuge in that part of the head which the

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brain fills; if I wish, for example, to recall a place or person it will arise before me with vividness, not according as I strain my attention forwards, but rather in proportion as I, so to speak, retract it backwards."^[359]

In myself the 'backward retraction' which is felt during attention to ideas of memory, etc., seems to be principally constituted by the feeling of an actual rolling outwards and upwards of the eyeballs, such as occurs in sleep, and is the exact opposite of their behavior when we look at a physical thing. I have already spoken of this feeling on [page 300](#).^[360] The reader who doubts the presence of these organic feelings is requested to read the whole of that passage again.

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It has been said, however, that we may attend to an object on the periphery of the visual field and yet not accommodate the eye for it. Teachers thus notice the acts of children in the school-room at whom they appear not to be looking. Women in general train their peripheral visual attention more than men. This would be an objection to the *invariable and universal* presence of movements of adjustment as ingredients of the attentive process. Usually, as is well known, no object lying in the marginal portions of the field of vision can catch our attention without at the same time 'catching our eye'—that is, fatally provoking such movements of rotation and accommodation as will focus its image on the fovea, or point of greatest sensibility. Practice, however, enables us, *with effort*, to attend to a marginal object whilst keeping the eyes immovable. The object under these circumstances never becomes perfectly distinct—the place of its image on the retina makes distinctness impossible—but (as anyone can satisfy himself by trying) we become more vividly conscious of it than we were before the effort was made. Helmholtz states the fact so strikingly that I will quote his observation in full. He was trying to combine in a single solid percept pairs of stereoscopic pictures illuminated instantaneously by the electric spark. The pictures were in a dark box which the spark from time to time lighted up; and, to keep the eyes from wandering betweenwhiles, a pin-hole was pricked through the middle of each picture, through which the light of the room came, so that each eye had presented to it during the dark intervals a single bright point. With parallel optical axes the points combined into a single image; and the slightest movement of the eyeballs was betrayed by this image at once becoming double. Helmholtz now found that simple linear figures could, when the eyes were thus kept immovable, be perceived as solids at a single flash of the spark. But when the figures were complicated photographs, many successive flashes were required to grasp their totality.

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"Now it is interesting," he says, "to find that, although we keep steadily fixating the pin-holes and never allow their combined image to break into two, we can, nevertheless, before the spark comes, keep our attention voluntarily turned to any particular portion we please of the dark field, so as then, when the spark comes, to receive an impression only from such parts of the picture as lie in this region. In this respect, then, our attention is quite independent of the position and accommodation of the eyes, and of any known alteration in these organs; and free to direct itself by a conscious and voluntary effort upon any selected portion of a dark and undifferenced field of view. This is one of the most important observations for a future theory of attention."^[361]

Hering, however, adds the following detail:

"Whilst attending to the marginal object we must always," he says, "*attend at the same time* to the object directly fixated. If even for a single instant we let the latter slip out of our mind, our eye moves towards the former, as may be easily

recognized by the after-images produced, or by the muscular sounds heard. The case is then less properly to be called one of translocation, than one of unusually wide *dispersion*, of the attention, in which dispersion the largest share still falls upon the thing directly looked at,"^[362]

and consequently directly accommodated for. Accommodation exists here, then, as it does elsewhere, and without it we should lose a part of our sense of attentive activity. In fact, the *strain* of that activity (which is remarkably great in the experiment) is due in part to unusually strong contractions of the muscles needed to keep the eyeballs still, which produce unwonted feelings of pressure in those organs.

2. But if the peripheral part of the picture in this experiment be not physically accommodated for, what is meant by its sharing our attention? What happens when we 'distribute' or 'disperse' the latter upon a thing for which we remain unwilling to 'adjust'? This leads us to that second feature in the process, the '*ideational preparation*' of which we spoke. *The effort to attend to the marginal region of the picture consists in nothing more nor less than the effort to form as clear an idea as is possible of what is there portrayed.* The idea is to come to the help of the sensation and make it more distinct. It comes with effort, and such a mode of coming is the remaining part of what we know as our attention's 'strain' under the circumstances. Let us show how universally present in our acts of attention this reinforcing imagination, this inward reproduction, this anticipatory thinking of the thing we attend to, is.

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It must as a matter of course be present when the attention is of the intellectual variety, for the thing attended to then *is* nothing but an idea, an inward reproduction or conception. If then we prove ideal construction of the object to be present in *sensorial* attention, it will be present everywhere. When, however, sensorial attention is at its height, it is impossible to tell how much of the percept comes from without and how much from within; but if we find that the *preparation* we make for it always partly consists of the creation of an imaginary duplicate of the object in the mind, which shall stand ready to receive the outward impression as if in a matrix, that will be quite enough to establish the point in dispute.

In Wundt's and Exner's experiments quoted above, the lying in wait for the impressions, and the preparation to react, consist of nothing but the anticipatory imagination of what the impressions or the reactions are to be. Where the stimulus is unknown and the reaction undetermined, time is lost, because no stable image can under such circumstances be formed in advance. But where both nature and time of signal and reaction are foretold, so completely does the expectant attention consist in premonitory imagination that, as we have seen ([Footnote 273](#); [pp. 373, 377](#)), it may mimic the intensity of reality, or at any rate produce reality's motor effects. It is impossible to read Wundt's and Exner's pages of description and not to interpret the '*Apperception*' and '*Spannung*' and other terms as equivalents of *imagination*. With Wundt, in particular, the word *Apperception* (which he sets great store by) is quite interchangeable with both imagination and attention. All three are names for the excitement from within of ideational brain-centres, for which Mr. Lewes's name of *preperception* seems the best possible designation.

Where the impression to be caught is very weak, the way not to miss it is to sharpen our attention for it by preliminary contact with it in a stronger form.

"If we wish to begin to observe overtones, it is advisable, just before the sound which is to be analyzed, to sound very softly the note of which we are in search.... The piano and harmonium are well fitted for this use, as both give overtones that are strong. Strike upon the piano first the g' [of a certain musical

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example previously given in the text]; then, when its vibrations have objectively ceased, strike powerfully the note *c*, in whose sound *g'* is the third overtone, and keep your attention steadily bent upon the pitch of the just heard *g'*; you will now hear this tone sounding in the midst of the *c*.... If you place the resonator which corresponds to a certain overtone, for example *g'* of the sound *c*, against your ear, and then make the note *c* sound, you will hear *g'* much strengthened by the resonator.... This strengthening by the resonator can be used to make the naked ear attentive to the sound which it is to catch. For when the resonator is gradually removed, the *g'* grows weaker; but the attention, once directed to it, holds it now more easily fast, and the observer hears the tone *g'* now in the natural unaltered sound of the note with his unaided ear."^[363]

Wundt, commenting on experiences of this sort, says that

"on carefully observing, one will always find that one tries first to recall the image in memory of the tone to be heard, and that then one hears it in the total sound. The same thing is to be noticed in weak or fugitive visual impressions. Illuminate a drawing by electric sparks separated by considerable intervals, and after the first, and often after the second and third spark, hardly anything will be recognized. But the confused image is held fast in memory; each successive illumination completes it; and so at last we attain to a clearer perception. The primary motive to this inward activity proceeds usually from the outer impression itself. We hear a sound in which, from certain associations, we suspect a certain overtone; the next thing is to recall the overtone in memory; and finally we catch it in the sound we hear. Or perhaps we see some mineral substance we have met before; the impression awakens the memory-image, which again more or less completely melts with the impression itself. In this way every idea takes a certain time to penetrate to the focus of consciousness. And during this time we always find in ourselves the peculiar *feeling* of attention.... The phenomena show that an *adaptation* of attention to the impression takes place. The surprise which unexpected impressions give us is due essentially to the fact that our attention, at the moment when the impression occurs, is not accommodated for it. The accommodation itself is of the double sort, relating as it does to the intensity as well as to the quality of the stimulus. Different qualities of impression require disparate adaptations. And we remark that our feeling of the *strain* of our inward attentiveness increases with every increase in the strength of the impressions on whose perception we are intent."^[364]

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The natural way of conceiving all this is under the symbolic form of a brain-cell played upon from two directions. Whilst the object excites it from without, other brain-cells, or perhaps spiritual forces, arouse it from within. The latter influence is the 'adaptation of the attention.' *The plenary energy of the brain-cell demands the co-operation of both factors:* not when merely present, but when both present and attended to, is the object fully perceived.

A few additional experiences will now be perfectly clear. Helmholtz, for instance, adds this observation to the passage we quoted a while ago concerning the stereoscopic pictures lit by the electric spark.

"These experiments," he says, "are interesting as regards the part which attention plays in the matter of double images.... For in pictures so simple that it is relatively difficult for me to see them double, I can succeed in seeing them double, even when the illumination is only instantaneous, the moment I strive

to *imagine in a lively way how they ought then to look*. The influence of attention is here pure; for all eye movements are shut out."^[365]

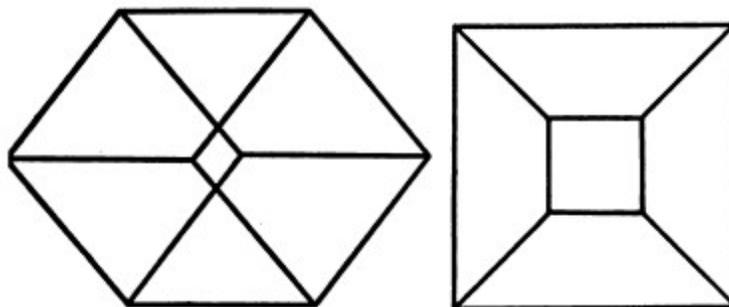
In another place^[366] the same writer says:

"When I have before my eyes a pair of stereoscopic drawings which are hard to combine, it is difficult to bring the lines and points that correspond, to cover each other, and with every little motion of the eyes they glide apart. *But if I chance to gain a lively mental image (Anschauungsbild) of the represented solid form* (a thing that often occurs by lucky chance), I then move my two eyes with perfect certainty over the figure without the picture separating again."

Again, writing of retinal rivalry, Helmholtz says:

"It is not a trial of strength between two sensations, but depends on our fixing or failing to fix the attention. Indeed, there is scarcely any phenomenon so well fitted for the study of the causes which are capable of determining the attention. It is not enough to form the conscious intention of seeing first with one eye and then with the other; *we must form as clear a notion as possible of what we expect to see. Then it will actually appear.*"^[367]

In figures 37 and 38, where the result is ambiguous, we can make the change from one apparent form to the other by imagining strongly in advance the form we wish to see. Similarly in those puzzles where certain lines in a picture form by their combination an object that has no connection with what the picture ostensibly represents; or indeed in every case where an object is inconspicuous and hard to discern from the background; we may not be able to see it for a long time; but, having once seen it, we can attend to it again whenever we like, on account of the mental duplicate of it which our imagination now bears. In the meaningless French words '*pas de lieu Rhône que nous,*' who can recognize immediately the English 'paddle your own canoe'?^[368] But who that has once noticed the identity can fail to have it arrest his attention again? When watching for the distant clock to strike, our mind is so filled with its image that at every moment we think we hear the longed-for or dreaded sound. So of an awaited footstep. Every stir in the wood is for the hunter his game; for the fugitive his pursuers. Every bonnet in the street is momentarily taken by the lover to enshroud the head of his idol. The image in the mind *is* the attention; the *preperception*, as Mr. Lewes calls it, is half of the perception of the looked-for thing.^[369] [Pg 442]



FIGS. 37 & 38.

It is for this reason that men have no eyes but for those aspects of things which they have already been taught to discern. Any one of us can notice a phenomenon after it has once been pointed out, which not one in ten thousand could ever have discovered for himself. Even in poetry and the arts, some one has to come and tell us what aspects we may single out, and what effects we may admire, before our æsthetic nature can 'dilate' to its full extent and never 'with the wrong emotion.' In kindergarten instruction one of the exercises is to [Pg 443]

make the children see how many features they can point out in such an object as a flower or a stuffed bird. They readily name the features they know already, such as leaves, tail, bill, feet. But they may look for hours without distinguishing nostrils, claws, scales, etc., until their attention is called to these details; thereafter, however, they see them every time. In short, *the only things which we commonly see are those which we preperceive*. and the only things which we preperceive are those which have been labelled for us, and the labels stamped into our mind. If we lost our stock of labels we should be intellectually lost in the midst of the world.

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Organic adjustment, then, and ideational preparation or preperception are concerned in all attentive acts. An interesting theory is defended by no less authorities than Professors Bain^[370] and Ribot,^[371] and still more ably advocated by Mr. N. Lange,^[372] who will have it that the ideational preparation itself is a consequence of muscular adjustment, so that the latter may be called the essence of the attentive process throughout. This at least is what the theory of these authors practically amounts to, though the former two do not state it in just these terms. The proof consists in the exhibition of cases of intellectual attention which organic adjustment accompanies, or of objects in thinking which we have to execute a movement. Thus Lange says that when he tries to imagine a certain colored circle, he finds himself first making with his eyes the movement to which the circle corresponds, and *then* imagining the color, etc., as a consequence of the movement.

"Let my reader," he adds, "close his eyes and think of an extended object, for instance a *pencil*. He will easily notice that he first makes a slight movement [of the eyes] corresponding to the straight line, and that he often gets a weak feeling of innervation of the hand as if touching the pencil's surface. So, in thinking of a certain sound, we turn towards its direction or repeat muscularly its rhythm, or articulate an imitation of it."^[373]

But it is one thing to point out the presence of muscular contractions as constant concomitants of our thoughts, and another thing to say, with Herr Lange, that thought is *made possible* by muscular contraction alone. It may well be that where the object of thought consists of two parts, one perceived by movement and another not, the part perceived by movement is habitually called up first and fixed in the mind by the movement's execution, whilst the other part comes secondarily as the movement's mere associate. But even were this the rule with all men (which I doubt^[374]), it would only be a practical habit, not an ultimate necessity. In the chapter on the Will we shall learn that movements themselves are results of images coming before the mind, images sometimes of feelings in the moving part, sometimes of the movement's effects on eye and ear, and sometimes (if the movement be originally reflex or instinctive), of its natural stimulus or exciting cause. It is, in truth, contrary to all wider and deeper analogies to deny that any quality of feeling whatever can directly rise up in the form of an idea, and to assert that only ideas of movement can call other ideas to the mind.

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So much for adjustment and preperception. The only third process I can think of as always present is the inhibition of irrelevant movements and ideas. This seems, however, to be a feature incidental to voluntary attention rather than the essential feature of attention at large,^[375] and need not concern us particularly now. Noting merely the intimate connection which our account so far establishes between attention, on the one hand, and imagination, discrimination, and memory, on the other, let us draw a couple of practical inferences, and then pass to the more speculative problem that remains.

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The practical inferences are pedagogic. First, *to strengthen attention in children* who care nothing for the subject they are studying and let their wits go wool-gathering. The interest here must be 'derived' from something that the teacher associates with the task, a reward or a punishment if nothing less external comes to mind. Prof. Ribot says:

"A child refuses to read; he is incapable of keeping his mind fixed on the letters, which have no attraction for him; but he looks with avidity upon the pictures contained in a book. 'What do they mean?' he asks. The father replies: 'When you can read, the book will tell you.' After several colloquies like this, the child resigns himself and falls to work, first slackly, then the habit grows, and finally he shows an ardor which has to be restrained. This is a case of the genesis of voluntary attention. An artificial and indirect desire has to be grafted on a natural and direct one. Reading has no immediate attractiveness, but it has a borrowed one, and that is enough. The child is caught in the wheelwork, the first step is made."

I take another example, from M. B. Perez:^[376]

"A child of six years, habitually prone to mind-wandering, sat down one day to the piano of his own accord to repeat an air by which his mother had been charmed. His exercises lasted an hour. The same child at the age of seven, seeing his brother busy with tasks in vacation, went and sat at his father's desk. 'What are you doing there?' his nurse said, surprised at so finding him. 'I am,' said the child, 'learning a page of German; it isn't very amusing, but it is for an agreeable surprise to mamma.'"

Here, again, a birth of voluntary attention, grafted this time on a sympathetic instead of a selfish sentiment like that of the first example. The piano, the German, awaken no spontaneous attention; but they arouse and maintain it by borrowing a force from elsewhere. ^[377]

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Second, take that mind-wandering which at a later age may trouble us *whilst reading or listening to a discourse*. If attention be the reproduction of the sensation from within, the habit of reading not merely with the eye, and of listening not merely with the ear, but of articulating to one's self the words seen or heard, ought to deepen one's attention to the latter. Experience shows that this is the case. I can keep my wandering mind a great deal more closely upon a conversation or a lecture if I actively re-echo to myself the words than if I simply hear them; and I find a number of my students who report benefit from voluntarily adopting a similar course.^[378]

Second, *a teacher who wishes to engage the attention of his class must knit his novelties on to things of which they already have preperceptions*. The old and familiar is readily attended to by the mind and helps to hold in turn the new, forming, in Herbartian phraseology, an 'Apperceptionsmasse' for it. Of course it is in every case a very delicate problem to know what 'Apperceptionsmasse' to use. Psychology can only lay down the general rule.

IS VOLUNTARY ATTENTION A RESULTANT OR A FORCE?

When, a few pages back, I symbolized the 'ideational preparation' element in attention by a brain-cell played upon from within, I added 'by other brain-cells, or by some spiritual force,' without deciding which. The question 'which?' is one of those central psychologic mysteries which part the schools. When we reflect that the turnings of our attention form the nucleus of our inner self; when we see (as in the chapter on the Will we shall see) that volition is

nothing but attention; when we believe that our autonomy in the midst of nature depends on our not being pure effect, but a cause,—

*Principium quoddam quod fati fœdera rumpat,
Ex infinito ne causant causa sequatur—*

we must admit that the question whether attention involve such a principle of spiritual activity or not is metaphysical as well as psychological, and is well worthy of all the pains we can bestow on its solution. It is in fact the pivotal question of metaphysics, the very hinge on which our picture of the world shall swing from materialism, fatalism, monism, towards spiritualism, freedom, pluralism,—or else the other way.

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It goes back to the automaton-theory. If feeling is an inert accompaniment, then of course the brain-cell can be played upon only by other brain-cells, and the attention which we give at any time to any subject, whether in the form of sensory adaptation or of 'preperception,' is the fatally predetermined *effect* of exclusively material laws. If, on the other hand, the feeling which coexists with the brain-cells' activity reacts dynamically upon that activity, furthering or checking it, then the attention is in part, at least, a *cause*. It does not necessarily follow, of course, that this reactive feeling should be 'free' in the sense of having its amount and direction undetermined in advance, for it might very well be predetermined in all these particulars. If it were so, our attention would not be *materially* determined, nor yet would it be 'free' in the sense of being spontaneous or unpredictable in advance. The question is of course a purely speculative one, for we have no means of objectively ascertaining whether our feelings react on our nerve-processes or not; and those who answer the question in either way do so in consequence of general analogies and presumptions drawn from other fields. As mere *conceptions*, the effect-theory and the cause-theory of attention are equally clear; and whoever affirms either conception to be true must do so on metaphysical or universal rather than on scientific or particular grounds.

As regards *immediate sensorial attention* hardly any one is tempted to regard it as anything but an effect.^[379] We are 'evolved' so as to respond to special stimuli by special accommodative acts which produce clear perceptions on the one hand in us, and on the other hand such feelings of inner activity as were above described. The accommodation and the resultant feeling *are* the attention. We don't bestow it, the object draws it from us. The object has the initiative, not the mind.

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Derived attention, where there is no voluntary effort, seems also most plausibly to be a mere effect. The object again takes the initiative and draws our attention to itself, not by reason of its own intrinsic interest, but because it is connected with some other interesting thing. Its brain-process is connected with another that is either excited, or tending to be excited, and the liability to share the excitement and become aroused is the liability to 'preperception' in which the attention consists. If I have received an insult, I may not be actively thinking of it all the time, yet the thought of it is in such a state of heightened irritability, that the place where I received it or the man who inflicted it cannot be mentioned in my hearing without my attention bounding, as it were, in that direction, as the imagination of the whole transaction revives. Where such a stirring-up occurs, organic adjustment must exist as well, and the ideas must innervate to some degree the muscles. Thus the whole process of involuntary derived attention is accounted for if we grant that there is something interesting enough to arouse and fix the thought of whatever may be connected with it. This fixing *is* the attention; and it carries with it a vague sense of activity going on, and of acquiescence, furtherance, and adoption, which makes us feel the activity to be our own.

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This reinforcement of ideas and impressions by the pre-existing contents of the mind was what Herbart had in mind when he gave the name of *apperceptive* attention to the variety we

describe. We easily see now why the lover's tap should be heard—it finds a nerve-centre half ready in advance to explode. We see how we can attend to a companion's voice in the midst of noises which pass unnoticed though objectively much louder than the words we hear. Each word is *doubly* awakened; once from without by the lips of the talker, but already before that from within by the premonitory processes irradiating from the previous words, and by the dim arousal of all processes that are connected with the 'topic' of the talk. The irrelevant noises, on the other hand, are awakened only once. They form an unconnected train. The boys at school, inattentive to the teacher except when he begins an anecdote, and then all pricking up their ears, are as easily explained. The words of the anecdote shoot into association with exciting objects which react and fix them; the other words do not. Similarly with the grammar heard by the purist and Herbart's other examples quoted on [page 418](#).

Even where the attention is voluntary, it is possible to conceive of it as an effect, and not a cause, a product and not an agent. The things we attend to *come to us* by their own laws. Attention *creates* no idea; an idea must already be there before we can attend to it. Attention only fixes and retains what the ordinary laws of association bring 'before the footlights' of consciousness. But the moment we admit this we see that the attention *per se*, the *feeling* of attending need no more fix and retain the ideas than it need bring them. The associates which bring them also fix them by the interest which they lend. In short, voluntary and involuntary attention may be essentially the same. It is true that where the ideas are intrinsically very unwelcome and the effort to attend to them is great, it seems to us as if the frequent renewal of the effort were the very cause by which they are held fast, and we naturally think of the effort as an original force. In fact it is only to the *effort to attend*, not to the mere *attending*, that we are seriously tempted to ascribe spontaneous power. We think we can make more of it *if we will*; and the amount which we make does not seem a fixed function of the ideas themselves, as it would necessarily have to be if our effort were an effect and not a spiritual force. But even here it is possible to conceive the facts mechanically and to regard the effort as a mere effect.

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Effort is felt only where there is a conflict of interests in the mind. The idea A may be intrinsically exciting to us. The idea Z may derive its interest from association with some remoter good. A may be our sweetheart, Z may be some condition of our soul's salvation. Under these circumstances, if we succeed in attending to Z at all it is always with expenditure of effort. The 'ideational preparation,' the 'preperception' of A keeps going on of its own accord, whilst that of Z needs incessant pulses of voluntary reinforcement—that is, we have the *feeling* of voluntary reinforcement (or effort) at each successive moment in which the thought of Z flares brightly up in our mind. Dynamically, however, that may mean only this: that the associative processes which make Z triumph are really the stronger, and in A's absence would make us give a 'passive' and unimpeded attention to Z; but, so long as A is present, some of their force is used to inhibit the processes concerned with A. Such inhibition is a partial neutralization of the brain-energy which would otherwise be available for fluent thought. But what is lost for thought is converted into feeling, in this case into the peculiar feeling of effort, difficulty, or strain.

The stream of our thought is like a river. On the whole easy simple flowing predominates in it, the drift of things is with the pull of gravity, and effortless attention is the rule. But at intervals an obstruction, a set-back, a log-jam occurs, stops the current, creates an eddy, and makes things temporarily move the other way. If a real river could feel, it would feel these eddies and set-backs as places of effort. "I am here flowing," it would say, "in the direction of greatest resistance, instead of flowing, as usual, in the direction of least. My effort is what enables me to perform this feat." Really, the effort would only be a passive index that the feat was being performed. The agent would all the while be the total downward drift of the rest of the water, forcing *some* of it upwards in this spot; and although, *on the average*, the direction of least resistance is downwards, that would be no reason for its not being upwards now and then. Just so with our voluntary acts of attention. They are momentary arrests, coupled with a peculiar feeling, of portions of the stream. But the arresting force, instead of

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being this peculiar feeling itself, may be nothing but the processes by which the collision is produced. The feeling of effort may be 'an accompaniment,' as Mr. Bradley says, 'more or less superfluous,' and no more contribute to the result than the pain in a man's finger, when a hammer falls on it, contributes to the hammer's weight. Thus the notion that our effort in attending is an original faculty, a force additional to the others of which brain and mind are the seat, may be an abject superstition. Attention may have to go, like many a faculty once deemed essential, like many a verbal phantom, like many an idol of the tribe. It may be an excrescence on Psychology. No need of it to drag ideas before consciousness or fix them, when we see how perfectly they drag and fix each other there.

I have stated the effect-theory as persuasively as I can.^[380] It is a clear, strong, well-equipped conception, and like all such, is fitted to carry conviction, where there is no contrary proof. The feeling of effort certainly *may* be an inert accompaniment and not the active element which it seems. No measurements are as yet performed (it is safe to say none ever will be performed) which can show that it contributes energy to the result. We *may* then regard attention as a superfluity, or a 'Luxus,' and dogmatize against its causal function with no feeling in our hearts but one of pride that we are applying Occam's razor to an entity that has multiplied itself 'beyond necessity.'

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But Occam's razor, though a very good rule of method, is certainly no law of nature. The laws of stimulation and of association may well be indispensable actors in all attention's performances, and may even be a good enough 'stock-company' to carry on many performances without aid; and yet they *may* at times simply form the background for a 'star-performer,' who is no more their 'inert accompaniment' or their 'incidental product' than Hamlet is Horatio's and Ophelia's. Such a star-performer would be the voluntary effort to attend, if it were an original psychic force. Nature *may*, I say, indulge in these complications; and the conception that she has done so in this case is, I think, just as clear (if not as 'parsimonious' logically) as the conception that she has not. To justify this assertion, *let us ask just what the effort to attend would effect if it were an original force.*

It would deepen and prolong the stay in consciousness of innumerable ideas which else would fade more quickly away. The delay thus gained might not be more than a second in duration—but that second might be *critical*; for in the constant rising and falling of considerations in the mind, where two associated systems of them are nearly in equilibrium it is often a matter of but a second more or less of attention at the outset, whether one system shall gain force to occupy the field and develop itself, and exclude the other, or be excluded itself by the other. When developed, it may make us act; and that act may seal our doom. When we come to the chapter on the Will, we shall see that the whole drama of the voluntary life hinges on the amount of attention, slightly more or slightly less, which rival motor ideas may receive. But the whole feeling of reality, the whole sting and excitement of our voluntary life, depends on our sense that in it things are *really being decided* from one moment to another, and that it is not the dull rattling off of a chain that was forged innumerable ages ago. This appearance, which makes life and history tingle with such a tragic zest, *may* not be an illusion. As we grant to the advocate of the mechanical theory that it may be one, so he must grant to us that it may *not*. And the result is two conceptions of possibility face to face with no facts definitely enough known to stand as arbiter between them.

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Under these circumstances, one can leave the question open whilst waiting for light, or one can do what most speculative minds do, that is, look to one's general philosophy to incline the beam. The believers in mechanism do so without hesitation, and they ought not to refuse a similar privilege to the believers in a spiritual force. I count myself among the latter, but as my reasons are ethical they are hardly suited for introduction into a psychological work.^[381]

The last word of psychology here is ignorance, for the 'forces' engaged are certainly too delicate and numerous to be followed in detail. Meanwhile, in view of the strange arrogance with which the wildest materialistic speculations persist in calling themselves 'science,' it is well to recall just what the reasoning is, by which the effect-theory of attention is confirmed. It is an argument from analogy, drawn from rivers, reflex actions and other material phenomena where no consciousness *appears* to exist at all, and extended to cases where consciousness seems the phenomenon's essential feature. *The consciousness doesn't count*, these reasoners say; it doesn't exist for science, it is *nil*; you mustn't think about it at all. The intensely reckless character of all this needs no comment. It is making the mechanical theory true *per fas aut nefas*. For the sake of that theory we make inductions from phenomena to others that are startlingly *unlike* them; and we assume that a complication which Nature has introduced (the presence of feeling and of effort, namely) is not worthy of scientific recognition at all. Such conduct may conceivably be *wise*, though I doubt it; but scientific, as contrasted with metaphysical, it cannot seriously be called.^[382]

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INATTENTION.

Having spoken fully of attention, let me add a word about *inattention*.

We do not notice the ticking of the clock, the noise of the city streets, or the roaring of the brook near the house; and even the din of a foundry or factory will not mingle with the thoughts of its workers, if they have been there long enough. When we first put on spectacles, especially if they be of certain curvatures, the bright reflections they give of the windows, etc., mixing with the field of view, are very disturbing. In a few days we ignore them altogether. Various entoptic images, *musca volitantes*, etc., although constantly present, are hardly ever known. The pressure of our clothes and shoes, the beating of our hearts and arteries, our breathing, certain steadfast bodily pains, habitual odors, tastes in the mouth, etc., are examples from other senses, of the same lapse into unconsciousness of any too unchanging content—a lapse which Hobbes has expressed in the well-known phrase, "*Semper idem sentire ac non sentire ad idem revertunt.*"

The cause of the unconsciousness is certainly not the mere blunting of the sense-organs. Were the sensation important, we should notice it well enough; and we can at any moment notice it by expressly throwing our attention upon it,^[383] provided it have not become so inveterate that inattention to it is ingrained in our very constitution, as in the case of the *musca volitantes* the double retinal images, etc. But even in these cases artificial conditions of observation and patience soon give us command of the impression which we seek. The inattentiveness must then be a habit grounded on higher conditions than mere sensorial fatigue.

Helmholtz has formulated a general law of inattention which we shall have to study in the next chapter but one. Helmholtz's law is that we leave all impressions unnoticed which are valueless to us as signs by which to *discriminate things*. At most such impressions fuse with their consorts into an aggregate effect. The upper partial tones which make human voices differ make them differ as wholes only—we cannot dissociate the tones themselves. The odors which form integral parts of the characteristic taste of certain substances, meat, fish, cheese, butter, wine, do not come as odors to our attention. The various muscular and tactile feelings that make up the perception of the attributes 'wet,' 'elastic,' 'doughy,' etc., are not singled out separately for what they are. And all this is due to an inveterate habit we have contracted, of passing from them immediately to their import and letting their substantive nature alone. They have formed connections in the mind which it is now difficult to break; they are constituents of processes which it is hard to arrest, and which differ altogether from what the processes of catching the attention would be. In the cases Helmholtz has in mind, not only we but our ancestors have formed these habits. In the cases we started from, however, of the mill-wheel, the spectacles, the factory din, the tight shoes, etc., the habits of

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inattention are more recent, and the manner of their genesis seems susceptible, hypothetically at least, of being traced.

How *can* impressions that are not needed by the intellect be thus shunted off from all relation to the rest of consciousness? Professor G. E. Müller has made a plausible reply to this question, and most of what follows is borrowed from him.^[384] He begins with the fact that

"When we first come out of a mill or factory, in which we have remained long enough to get wonted to the noise, we feel as if something were *lacking*. Our total feeling of existence is different from what it was when we were in the mill.... A friend writes to me: 'I have in my room a little clock which does not run quite twenty-four hours without winding. In consequence of this, it often stops. So soon as this happens, I notice it, whereas I naturally fail to notice it when going. When this first began to happen, there was this modification: I suddenly felt an undefined uneasiness or sort of void, without being able to say what was the matter; and only after some consideration did I find the cause in the stopping of the clock.'"

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That the stopping of an unfelt stimulus may itself be felt is a well-known fact: the sleeper in church who wakes when the sermon ends; the miller who does the same when his wheel stands still, are stock examples. Now (since every impression falling on the nervous system must propagate itself somewhither), Müller suggests that impressions which come to us when the thought-centres are preoccupied with other matters may thereby be blocked or inhibited from invading these centres, and may then overflow into lower paths of discharge. And he farther suggests that if this process recur often enough, the side-track thus created will grow so permeable as to be used, no matter what may be going on in the centres above. In the acquired inattention mentioned, the constant stimulus always caused disturbance *at first*; and consciousness of it was extruded successfully only when the brain was *strongly excited* about other things. Gradually the extrusion became easier, and at last automatic.

The side-tracks which thus learn to draft off the stimulations that interfere with thought cannot be assigned with any precision. They probably terminate in organic processes, or insignificant muscular contractions which, when stopped by the cessation of their instigating cause, immediately give us the feeling that something is gone from our existence (as Müller says), or (as his friend puts it) the feeling of a void.^[385]

Müller's suggestion awakens another. It is a well-known fact that persons striving to keep their attention on a difficult subject will resort to movements of various unmeaning kinds, such as pacing the room, drumming with the fingers, playing with keys or watch-chain, scratching head, pulling mustache, vibrating foot, or what not, according to the individual. There is an anecdote of Sir W. Scott, when a boy, rising to the head of his class by cutting off from the jacket of the usual head-boy a button which the latter was in the habit of twirling in his fingers during the lesson. The button gone, its owner's power of reciting also departed.—Now much of this activity is unquestionably due to the overflow of emotional excitement during anxious and concentrated thought. It drains away nerve-currents which if pent up within the thought-centres would very likely make the confusion there worse confounded. But may it not also be a means of drafting off all the irrelevant sensations of the moment, and so keeping the attention more exclusively concentrated upon its inner task? Each individual usually has his own peculiar habitual movement of this sort. A downward nerve-path is thus kept constantly open during concentrated thought; and as it seems to be a law of frequent (if not of universal) application, that incidental stimuli tend to discharge through paths that are already discharging rather than through others, the whole arrangement might protect the thought-centres from interference from without. Were this the true *rationale* of these peculiar movements, we should have to suppose that the sensations

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produced by each phase of the movement itself are also drafted off immediately by the next phase and help to keep the circular process agoing. I offer the suggestion for what it is worth; the connection of the movements themselves with the continued effort of attention is certainly a genuine and curious fact.

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- [322] Bain mentions attention in the Senses and the Intellect, p. 558, and even gives a theory of it on pp. 370-374 of the Emotions of the Will. I shall recur to this theory later on.
- [323] "The first and most important, but also the most difficult, task at the outset of an education is to overcome gradually the inattentive dispersion of mind which shows itself wherever the organic life preponderates over the intellectual. The training of animals ... must be in the first instance based on the awakening of attention (cf. Adrian Leonard, *Essai sur l'Education des Animaux*, Lille, 1842), that is to say, we must seek to make them gradually perceive separately things which, if left to themselves, would not be attended to, because they would fuse with a great sum of other sensorial stimuli to a confused total impression of which each separate item only darkens and interferes with the rest. Similarly at first with the human child. The enormous difficulties of deaf-mute- and especially of idiot-instruction is principally due to the slow and painful manner in which we succeed in bringing out from the general confusion of perception single items with sufficient sharpness." (Waitz, *Lehrb. d. Psychol.*, p. 632.)
- [324] Elements, part i, chap. ii, *fin.*
- [325] Lectures on Metaphysics, lecture xiv.
- [326] Nature, vol. iii, p. 281 (1871).
- [327] If a lot of dots or strokes on a piece of paper be exhibited for a moment to a person in *normal* condition, with the request that he say how many are there, he will find that they break into groups in his mind's eye, and that whilst he is analyzing and counting one group in his memory the others dissolve. In short, the impression made by the dots changes rapidly into something else. In the *trance-subject*, on the contrary, it seems to *stick*; I find that persons in the hypnotic state easily count the dots in the mind's eye so long as they do not much exceed twenty in number.
- [328] Mr. Cattell made Jevons's experiment in a much more precise way (*Philosophische Studien*, iii, 121 ff.). Cards were ruled with short lines, varying in number from four to fifteen, and exposed to the eye for a hundredth of a second. When the number was but four or five, no mistakes as a rule were made. For higher numbers the tendency was to under- rather than to over-estimate. Similar experiments were tried with letters and figures, and gave the same result. When the letters formed familiar words, three times as many of them could be named as when their combination was meaningless. If the words formed a sentence, twice as many of them could be caught as when they had no connection. "The sentence was then apprehended as a whole. If not apprehended thus, almost nothing is apprehended of the several words; but if the sentence as a whole is apprehended, then the words appear very distinct."—Wundt and his pupil Dietze had tried similar experiments on rapidly repeated strokes of sound. Wundt made them follow each other in groups, and found that groups of twelve strokes at most could be recognized and identified when they succeeded each other at the most favorable rate, namely, from three to five tenths of a second (*Phys. Psych.*, ii, 215). Dietze found that by mentally subdividing the groups into sub-groups as one listened, as many as forty strokes could be identified as a whole. They were then grasped as eight sub-groups of five, or as five of eight strokes each.

(Philosophische Studien, ii, 362.)—Later in Wundt's Laboratory, Bechterew made observations on two *simultaneously* elapsing series of metronome strokes, of which one contained one stroke more than the other. The most favorable rate of succession was 0.3 sec., and he then discriminated a group of 18 from one of 18 + 1, apparently. (Neurologisches Centralblatt, 1889, 272.)

- [329] Revue Scientifique, vol. 39, p. 684 (May 28, 1887).
- [330] Cf. Chr. Wolff: Psychologia Empirica, § 245. Wolff's account of the phenomena of attention is in general excellent.
- [331] Pflüger's Archiv, xi, 429-31.
- [332] Physiol. Psych., 2d ed. ii, pp. 238-40.
- [333] *Ib.* p. 262.
- [334] Physiol. Psych., 2d ed. ii, 264-6.
- [335] This was the original 'personal equation' observation of Bessel. An Observer looked through his equatorial telescope to note the moment at which a star crossed the meridian, the latter being marked in the telescopic field of view by a visible thread, beside which other equidistant threads appear. "Before the star reached the thread he looked at the clock, and then, with eye at telescope, counted the seconds by the beat of the pendulum. Since the star seldom passed the meridian at the exact moment of a beat, the observer, in order to estimate fractions, had to note its position at the stroke before and at the stroke after the passage, and to divide the time as the meridian-line seemed to divide the space. If, e.g., one had counted 20 seconds, and at the 21st the star seemed removed by *ac* from the meridian-thread *c*, whilst at the 22d it was at the distance *bc*; then, if *ac*:*bc*:: 1: 2, the star would have passed at 21 1/8 seconds. The conditions resemble those in our experiment: the star is the index-hand, the threads are the scale; and a time-displacement is to be expected, which with high rapidities may be positive, and negative with low. The astronomic observations do not permit us to measure its absolute amount; but that it exists is made certain by the fact than after all other possible errors are eliminated, there still remains between different observers a personal difference which is often much larger than that between mere reaction-times, amounting ... sometimes to more than a second." (*Op. cit.* p. 270.)

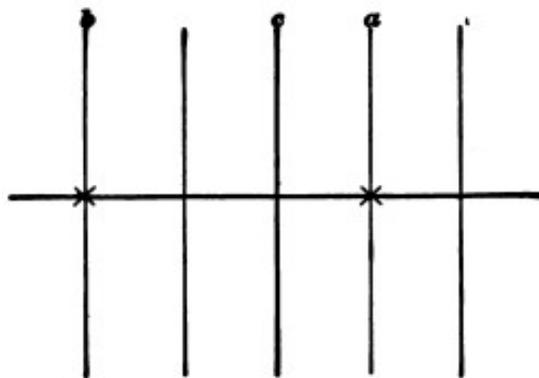


FIG. 35.

- [336] Philosophische Studien, ii, 601.
- [337] Physiol. Psych., 2d ed. ii, 273-4; 3d ed. ii, 339; Philosophische Studien, ii, 621 ff. —I know that I am stupid, but I confess I find these theoretical statements, especially Wundt's, a little hazy. Herr v. Tschisch considers it impossible that the perception of the index's position should come in too late, and says it demands no particular attention (p. 622). It seems, however, that this can hardly be the case. Both observers speak of the difficulty of seeing the index at the right moment. The case is quite different from that of distributing the attention impartially over simultaneous momentary sensations. The bell or other signal gives a momentary

sensation, the index a continuous one, of motion. To note any one *position* of the latter is to *interrupt* this sensation of motion and to substitute an entirely different percept—one, namely, of position—for it, during a time however brief. This involves a sudden change in the manner of attending to the revolutions of the index; which change *ought* to take place neither sooner nor later than the momentary impression, and *fix* the index as it is then and there visible. Now this is not a case of simply getting two sensations at once and so feeling them—which would be an harmonious act; but of *stopping one* and changing it into another, whilst we simultaneously get a third. Two of these acts are discrepant, and the whole three rather interfere with each other. It becomes hard to 'fix' the index at the very instant that we catch the momentary impression; so we fall into a way of fixing it either at the last possible moment before, or at the first possible moment after, the impression comes.

This at least seems to me the more probable state of affairs. If we fix the index before the impression really comes, that means that we perceive it too late. But why do we fix it *before* when the impressions come slow and simple, and *after* when they come rapid and complex? And why under certain conditions is there no displacement at all? The answer which suggests itself is that when there is just enough leisure between the impressions for the attention to adapt itself comfortably both to them and to the index (one second in W.'s experiments), it carries on the two processes at once; when the leisure is excessive, the attention, following its own laws of ripening, and being *ready* to note the index before the other impression comes, notes it *then*, since that is the moment of easiest action, whilst the impression, which comes a moment later, interferes with noting it again; and finally, that when the leisure is insufficient, the momentary impressions, being the more fixed data, are attended to first, and the index is fixed a little later on. The noting of the index at too early a moment would be the noting of a real fact, with its analogue in many other rhythmical experiences. In reaction-time experiments, for example, when, in a regularly recurring series, the stimulus is once in a while omitted, the observer sometimes reacts as if it came. Here, as Wundt somewhere observes, we catch ourselves acting merely because our inward preparation is complete. The 'fixing' of the index is a sort of action; so that my interpretation tallies with facts recognized elsewhere; but Wundt's explanation (if I understand it) of the experiments requires us to believe that an observer like v. Tschisch shall steadily and without exception get an hallucination of a bell-stroke before the latter occurs, and *not hear the real bell-stroke afterwards*. I doubt whether this is possible, and I can think of no analogue to it in the rest of our experience. The whole subject deserves to be gone over again. To Wundt is due the highest credit for his patience in working out the facts. His explanation of them in his earlier work (*Vorlesungen üb. Menschen und Thierseele*, i, 37-42, 365-371) consisted merely in the appeal to the unity of consciousness, and may be considered quite crude.

- [338] Note that the permanent interests are themselves grounded in certain objects and relations in which our interest is immediate and instinctive.
- [339] Herbart: *Psychologie als Wissenschaft*, § 128.
- [340] Sir W. Hamilton. *Metaphysics*, lecture xiv.
- [341] *Mental Physiol.*, § 124. The oft-cited case of soldiers not perceiving that they are wounded is of an analogous sort.
- [342] Prof. J. M. Cattell made experiments to which we shall refer further on, on the degree to which reaction-times might be shortened by distracting or voluntarily concentrating the attention. He says of the latter series that "the averages show that the attention can be kept strained, that is, the centres kept in a state of unstable equilibrium, for one second" (*Mind*, xi, 240).
- [343] *Physiologische Optik*, § 32.

- [344] "'Genius,' says Helvetius, 'is nothing but a continued attention (*une attention suivie*).' 'Genius,' says Buffon, 'is only a protracted patience (*une longue patience*).' 'In the exact sciences, at least,' says Cuvier, 'it is the patience of a sound intellect, when invincible, which truly constitutes genius.' And Chesterfield has also observed that 'the power of applying an attention, steady and undissipated, to a single object, is the sure mark of a superior genius.'" (Hamilton: Lect. on Metaph., lecture xiv.)
- [345] See, e.g., Ulrici: Leib u. Seele, ii, 28; Lotze: Metaphysik, § 273; Fechner, Revision d. Psychophysik, xix; G. E. Müller: Zur Theorie d. sinnl. Aufmerksamkeit, § 1; Stumpf: Tonpsychologie, i, 71.
- [346] Fechner, *op. cit.* p. 271.
- [347] Tonpsychologie, i, p. 71.
- [348] Compare, on clearness as the essential fruit of attention, Lotze's Metaphysic, § 273.
- [349] Elements, part i, chap. ii.
- [350] Physiol. Psych., 2d ed. ii, 226.
- [351] By a negative value of the reaction-time Wundt means the case of the reactive movement occurring *before* the stimulus.
- [352] *Op. cit.* ii, 239.
- [353] The reader must not suppose this phenomenon to be of frequent occurrence. Experienced observers, like Exner and Cattell, deny having met with it in their personal experience.
- [354] *Op. cit.* pp. 241-5.
- [355] It should be added that Mr. J. M. Cattell (*Mind*, xi, 33) found, on repeating Wundt's experiments with a disturbing noise upon two practised observers, that the simple reaction-time either for light or sound was hardly perceptibly increased. Making strong voluntary concentration of attention shortened it by about 0.013 seconds on an average (p. 240). Performing mental additions whilst waiting for the stimulus lengthened it more than anything, apparently. For other, less careful, observations, compare Obersteiner, in *Brain*, i, 439. Cattell's negative results show how far some persons can abstract their attention from stimuli by which others would be disturbed.—A. Bartels (*Versuche über die Ablenkung d. Aufmerksamkeit*, Dorpat, 1889) found that a stimulus to one eye sometimes prevented, sometimes improved, the perception of a quickly ensuing very faint stimulus to the other.
- [356] Cf. Wundt, *Physiol. Psych.*, 1st ed. p. 794.
- [357] *Beiträge zur Experimentellen Psychologie*, Heft i, pp. 73-106 (1889).
- [358] To say the very least, he always brought his articulatory innervation close to the discharging point. Herr M. describes a tightening of the head-muscles as characteristic of the attitude of attention to the reply.
- [359] *Psychophysik*, Bd. ii, pp. 475-6.
- [360] I must say that I am wholly unconscious of the peculiar feelings in the scalp which Fechner goes on to describe. "The feeling of strained attention in the different sense-organs seems to be only a muscular one produced in using these various organs by setting in motion, by a sort of reflex action, the muscles which belong to them. One can ask, then, with what particular muscular contraction the sense of strained attention in the effort to recall something is associated? On this question my own feeling gives me a decided answer; it comes to me distinctly, not as a sensation of tension in the inside of the head, but as a feeling of strain and contraction in the scalp with a pressure from without inwards over the whole

cranium, undoubtedly caused by a contraction of the muscles of the scalp. This harmonizes very well with the German popular expression *den Kopf zusammenehmen*, etc., etc. In a former illness, in which I could not endure the slightest effort of continuous thought, and had no theoretical bias on this question, the muscles of the scalp, especially those of the occiput, assumed a fairly morbid degree of sensibility whenever I tried to *think*." (*Ibid.* pp. 490-491.) In an early writing by Professor Mach, after speaking of the way in which by attention we decompose complex musical sounds into their elements, this investigator continues: "It is more than a figure of speech when one says that we 'search' among the sounds. This hearkening search is very observably a bodily activity, just like attentive looking in the case of the eye. If, obeying the drift of physiology, we understand by attention nothing mystical, but a bodily disposition, it is most natural to seek it in the variable tension of the muscles of the ear. Just so, what common men call attentive looking reduces itself mainly to accommodating and setting of the optic axes.... According to this, it seems to me a very plausible view that quite generally Attention has its seat in the mechanism of the body. If nervous work is being done through certain channels, that by itself is a mechanical ground for other channels being closed." (*Wien. Sitzungsberichte, Math. Naturw.*, xlviii, 2, 297. 1863.)

- [361] *Physiol. Optik*, p. 741.
- [362] *Hermann's Handbuch*, iii, i, 548.
- [363] *Helmholtz: Tonempfindungen*, 3d ed. 85-9 (Engl. tr., 2d ed. 50, 51; see also pp. 60-1).
- [364] *Physiol. Psych.*, ii, 209.
- [365] *Physiol. Optik*, 741.
- [366] P. 728.
- [367] *Popular Scientific Lectures, Eng. Trans.*, p. 295.
- [368] Similarly in the verses which some one tried to puzzle me with the other day: "*Gui n'a beau dit, qui sabot dit, nid a beau dit elle?*"
- [369] I cannot refrain from referring in a note to an additional set of facts instanced by Lotze in his *Medizinische Psychologie*, § 431, although I am not satisfied with the explanation, fatigue of the sense-organ, which *he* gives. "In quietly lying and contemplating a wall-paper pattern, sometimes it is the ground, sometimes the design, which is clearer and consequently comes nearer.... Arabesques of monochromic many-convoluted lines now strike us as composed of one, now of another connected linear system, and all without any intention on our part. [This is beautifully seen in Moorish patterns; but a simple diagram like Fig. 39 also shows it well.

We see it sometimes as two large triangles superposed, sometimes as a hexagon with angles spanning its sides, sometimes as six small triangles stuck together at their corners.]... Often it happens in reverie that when we stare at a picture, suddenly some one of its features will be lit up with especial clearness, although neither its optical character nor its meaning discloses any motive for such an arousal of the attention.... To one in process of becoming drowsy the surroundings alternately fade into darkness and abruptly brighten up. The talk of the bystanders seems now to come from indefinite distances; but at the next moment it startles us by its threatening loudness at our very ear," etc. These variations, which everyone will have noticed, are, it

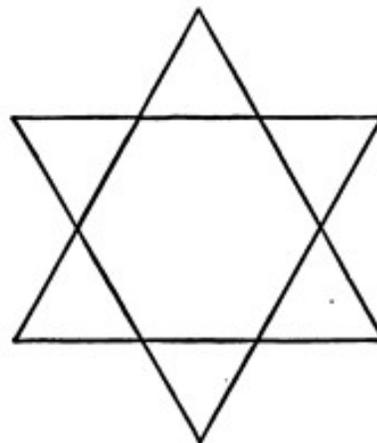


FIG. 39.

seems to me, easily explicable by the very unstable equilibrium of our ideational centres, of which constant change is the law. We *conceive* one set of lines as object, the other as background, and forthwith the first set becomes the set we *see*. There need be no *logical* motive for the conceptual change, the irradiations of brain-tracts by each other, according to accidents of nutrition, 'like sparks in burnt-up paper,' suffice. The changes during drowsiness are still more obviously due to this cause.

- [370] The Emotions and the Will, 3d ed. p. 370.
- [371] Psychologie de l'Attention (1889), p. 32 ff.
- [372] Philosophische Studien, iv, 413 ff.
- [373] See Lange, *loc. cit.* p. 417, for another proof of his view, drawn from the phenomenon of retinal rivalry.
- [374] Many of my students have at my request experimented with imagined letters of the alphabet and syllables, and they tell me that they can see them inwardly as total colored pictures without following their outlines with the eye. I am myself a bad visualizer, and make movements all the while.—M. L. Marillier, in an article of eminent introspective power which appeared after my text was written (Remarques sur le Mécanisme de l'Attention, in Revue Philosophique, vol. xxvii, p. 566), has contended against Ribot and others for the non-dependence of sensory upon motor images in their relations to attention. I am glad to cite him as an ally.
- [375] Drs. Ferrier (Functions of the Brain, §§ 102-3) and Obersteiner (Brain, i, 439 ff.) treat it as the essential feature. The author whose treatment of the subject is by far the most thorough and satisfactory is Prof. G. E. Müller, whose little work Zur Théorie der sinnlichen Aufmerksamkeit, Inauguraldissertation, Leipzig, Edelmann (1874?), is for learning and acuteness a model of what a monograph should be. I should like to have quoted from it, but the Germanism of its composition makes quotation quite impossible. See also G. H. Lewes: Problems of Life and Mind, 3d Series, Prob. 2, chap. 10; G. H. Schneider: Der menschliche Wille, 294 ff., 309 ff.; C. Stumpf: Tonpsychologie, i, 67-75; W. B. Carpenter: Mental Physiology, chap. 3; Cappie in 'Brain,' July 1886 (hyperæmia-theory); J. Sully in 'Brain,' Oct. 1890.
- [376] L'Enfant de trois à sept Ans, p. 108.
- [377] Psychologie de l'Attention, p. 53.
- [378] Repetition of this sort does not confer *intelligence* of what is said, it only keeps the mind from wandering into other channels. The intelligence sometimes comes in beats, as it were, at the end of sentences, or in the midst of words which were mere words until then. See above, [p. 281](#).
- [379] The reader will please observe that I am saying all that can *possibly* be said in favor of the effect-theory, since, inclining as I do myself to the cause-theory, I do not want to undervalue the enemy. As a matter of fact, one might begin to take one's stand against the effect theory at the outset, with the phenomenon of immediate sensorial attention. One might say that attention causes the movements of adjustment of the eyes, for example, and is not merely their effect. Hering writes most emphatically to this effect: "The movements from one point of fixation to another are occasioned and regulated by the changes of place of the attention. When an object, seen at first indirectly, draws our attention to itself, the corresponding movement of the eye follows without further ado, as a consequence of the attention's migration and of our effort to make the object distinct. The wandering of the attention entails that of the fixation point. Before its movement begins, its goal is already in consciousness and grasped by the attention, and the location of this spot in the total space seen is what determines the direction and amount of the movement of the eye." (Hermann's Handbuch, p.

534.) I do not here insist on this, because it is hard to tell whether the attention or the movement comes first (Hering's reasons, pp. 535-6, also 544-6, seem to me ambiguous), and because, even if the attention to the object does come first, it may be a mere effect of stimulus and association. Mach's theory that the *will to look* is the *space-feeling itself* may be compared with Hering's in this place. See Mach's *Beiträge zur Analyse der Empfindungen* (1886), pp. 55 ff.

- [380] F. H. Bradley, "Is there a Special Activity of Attention?" in 'Mind,' xi, 305, and Lipps, *Grundtatsachen*, chaps. iv and xxx, have stated it similarly.
- [381] More will be said of the matter when we come to the chapter on the Will.
- [382] See, for a defence of the notion of inward activity, Mr. James Ward's searching articles in 'Mind,' xii, 45 and 564.
- [383] It must be admitted that some little time will often elapse before this effort succeeds. As a child, I slept in a nursery with a very loud-ticking clock, and remember my astonishment more than once, on listening for its tick, to find myself unable to catch it for what seemed a long space of time; then suddenly it would break into my consciousness with an almost startling loudness.—M. Delbœuf somewhere narrates how, sleeping in the country near a mill-dam, he woke in the night and thought the water had ceased to flow, but on looking out of the open window saw it flowing in the moonlight, and then heard it too.
- [384] Zur Theorie d. sinnl. Aufmerksamkeit, p. 128 foll.
- [385] I have begun to inquire experimentally whether any of the measurable functions of the workmen change after the din of machinery stops at a workshop. So far I have found no constant results as regards either pulse, breathing, or strength of squeeze by the hand. I hope to prosecute the inquiry farther (May, 1890).

CHAPTER XII.

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CONCEPTION.

THE SENSE OF SAMENESS.

In Chapter VIII, [p. 221](#), the distinction was drawn between two kinds of knowledge of things, bare acquaintance with them and knowledge about them. The possibility of two such knowledges depends on a fundamental psychical peculiarity which may be entitled "*the principle of constancy in the mind's meanings*" and which may be thus expressed: "*The same matters can be thought of in successive portions of the mental stream, and some of these portions can know that they mean the same matters which the other portions meant.*" One might put it otherwise by saying that "*the mind can always intend, and know when it intends, to think of the Same.*"

This *sense of sameness* is the very keel and backbone of our thinking. We saw in [Chapter X](#) how the consciousness of personal identity reposed on it, the present thought finding in its memories a warmth and intimacy which it recognizes as the same warmth and intimacy it now feels. This sense of identity of the knowing subject is held by some philosophers to be the only vehicle by which the world hangs together. It seems hardly necessary to say that a sense of identity of the known object would perform exactly the same unifying function, even if the sense of subjective identity were lost. And without the intention to think of the same outer things over and over again, and the sense that we were doing so, our sense of our own personal sameness would carry us but a little way towards making a universe of our experience.

Note, however, that we are in the first instance speaking of the sense of sameness from the point of view of the mind's structure alone, and not from the point of view of the universe. We are psychologizing, not philosophizing. That is, we do not care whether there be any *real* sameness in *things* or not, or whether the mind be true or false in its assumptions of it. Our principle only lays it down that the mind makes continual use of the *notion* of sameness, and if deprived of it, would have a different structure from what it has. In a word, the principle that the mind can mean the Same is true of its *meanings*, but not necessarily of aught besides.^[386] The mind must conceive as possible that the Same should be before it, for our experience to be the sort of thing it is. Without the psychological sense of identity, sameness might rain down upon us from the outer world for ever and we be none the wiser. With the psychological sense, on the other hand, the outer world might be an unbroken flux, and yet we should perceive a repeated experience. Even now, the world may be a place in which the same thing never did and never will come twice. The thing we mean to point at may change from top to bottom and we be ignorant of the fact. But in our meaning itself we are not deceived; our intention is to think of the same. The name which I have given to the principle, in calling it the law of constancy in our meanings, accentuates its subjective character, and justifies us in laying it down as the most important of all the features of our mental structure.

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Not all psychic life need be assumed to have the sense of sameness developed in this way. In the consciousness of worms and polyps, though the same realities may frequently impress it, the feeling of sameness may seldom emerge. We, however, running back and forth, like spiders on the web they weave, feel ourselves to be working over identical materials and thinking them in different ways. And the man who identifies the materials most is held to have the most philosophic human mind.

CONCEPTION DEFINED.

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The function by which we thus identify a numerically distinct and permanent subject of discourse is called CONCEPTION; and the thoughts which are its vehicles are called concepts. But the word 'concept' is often used as if it stood for the object of discourse itself; and this looseness feeds such evasiveness in discussion that I shall avoid the use of the expression concept altogether, and speak of 'conceiving state of mind,' or something similar, instead. The word 'conception' is unambiguous. It properly denotes neither the mental state nor what the mental state signifies, but the relation between the two, namely, the *function* of the mental state in signifying just that particular thing. It is plain that one and the same mental state can be the vehicle of many conceptions, can mean a particular thing, and a great deal more besides. If it has such a multiple conceptual function, it may be called an act of compound conception.

We may conceive realities supposed to be extra-mental, as steam-engine; fictions, as mermaid; or mere *entia rationis*, like difference or nonentity. But whatever we do conceive, our conception is of that and nothing else—nothing else, that is, *instead* of that, though it may be of much else *in addition* to that. Each act of conception results from our attention singling out some one part of the mass of matter for thought which the world presents, and holding fast to it, without confusion.^[387] Confusion occurs when we do not know whether a certain object proposed to us is the same with one of our meanings or not; so that the conceptual function requires, to be complete, that the thought should not only say 'I mean this,' but also say 'I don't mean that.'^[388]

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Each conception thus eternally remains what it is, and never can become another. The mind may change its states, and its meanings, at different times; may drop one conception and take up another, but the dropped conception can in no intelligible sense be said to *change into* its successor. The paper, a moment ago white, I may now see to have been scorched black. But my conception 'white' does not change into my conception 'black.' On the

contrary, it stays alongside of the objective blackness, as a different meaning in my mind, and by so doing lets me judge the blackness as the paper's change. Unless it stayed, I should simply say 'blackness' and know no more. Thus, amid the flux of opinions and of physical things, the world of conceptions, or things intended to be thought about, stands stiff and immutable, like Plato's Realm of Ideas.^[389]

Some conceptions are of things, some of events, some of qualities. Any fact, be it thing, event, or quality, may be conceived sufficiently for purposes of identification, if only it be singled out and marked so as to separate it from other things. Simply calling it 'this' or 'that' will suffice. To speak in technical language, a subject may be conceived by its *denotation*, with no *connotation*, or a very minimum of connotation, attached. The essential point is that it should be re-identified by us as that which the talk is about; and no full representation of it is necessary for this, even when it is a fully representable thing. [Pg 463]

In this sense, creatures extremely low in the intellectual scale may have conception. All that is required is that they should recognize the same experience again. A polyp would be a conceptual thinker if a feeling of 'Hollo! thingumbob again!' ever flitted through its mind.

Most of the objects of our thought, however, are to some degree represented as well as merely pointed out. Either they are things and events perceived or imagined, or they are qualities apprehended in a positive way. Even where we have no intuitive acquaintance with the nature of a thing, if we know any of the relations of it at all, anything *about* it, that is enough to individualize and distinguish it from all the other things which we might mean. Many of our topics of discourse are thus *problematical*, or defined by their relations only. We think of a thing *about* which certain facts must obtain, but we do not yet know how the thing will look when it is realized. Thus we conceive of a perpetual-motion machine. It is a *quæsitum* of a perfectly definite kind,—we can always tell whether the actual machines offered us do or do not agree with what we mean by it. The natural possibility or impossibility of the thing does not touch the question of its conceivability in this problematic way. 'Round square,' 'black-white-thing,' are absolutely definite conceptions; it is a mere accident, as far as conception goes, that they happen to stand for things which nature never lets us sensibly perceive.^[390]

CONCEPTIONS ARE UNCHANGEABLE.

The fact that the same real topic of discourse is at one time conceived as a mere 'that' or 'that which, etc.,' and is at another time conceived with additional specifications, has been treated by many authors as a proof that conceptions themselves are fertile and self-developing. A conception, according to the Hegelizers in philosophy, 'develops its own significance,' 'makes explicit what it implicitly contained,' passes, on occasion, 'over into its opposite,' and in short loses altogether the blankly self-identical character we supposed it to maintain. The figure we viewed as a polygon appears to us now as a sum of juxtaposed triangles; the number hitherto conceived as thirteen is at last noticed to be six plus seven, or prime; the man thought honest is believed a rogue. Such changes of our opinion are viewed by these thinkers as evolutions of our conception, from within.

The facts are unquestionable; our knowledge does grow and change by rational and inward processes, as well as by empirical discoveries. Where the discoveries are empirical, no one pretends that the propulsive agency, the force that makes the knowledge develop, is mere conception. All admit it to be our continued exposure to the *thing*, with its power to impress our senses. Thus strychnin, which tastes bitter, we find will also kill, etc. Now I say that where the new knowledge merely comes from *thinking*, the facts are essentially the same, and that *to talk of self-development on the part of our conceptions is a very bad way of stating the case*. Not new sensations, as in the empirical instance, but new conceptions, are the indispensable conditions of advance. [Pg 465]

For if the alleged cases of self-development be examined it will be found, I believe, that the new truth affirms in every case a *relation* between the original subject of conception and some new subject conceived later on. These new subjects of conception arise in various ways. Every one of our conceptions is of something which our attention originally tore out of the continuum of felt experience, and provisionally isolated so as to make of it an individual topic of discourse. Every one of them has a way, if the mind is left alone with it, of suggesting other parts of the continuum from which it was torn, for conception to work upon in a similar way. This 'suggestion' is often no more than what we shall later know as the association of ideas. Often, however, it is a sort of invitation to the mind to play, add lines, break number-groups, etc. Whatever it is, it brings new conceptions into consciousness, which latter thereupon may or may not expressly attend to the relation in which the new stands to the old. Thus I have a conception of equidistant lines. Suddenly, I know not whence, there pops into my head the conception of their meeting. Suddenly again I think of the meeting and the equidistance both together, and perceive them incompatible. "Those lines will never meet," I say. Suddenly again the word 'parallel' pops into my head. 'They are parallels,' I continue; and so on. Original conceptions to start with; adventitious conceptions pushed forward by multifarious psychologic causes; comparisons and combinations of the two; resultant conceptions to end with; which latter may be of either rational or empirical relations.

As regards these relations, they are conceptions of the second degree, as one might say, and their birthplace is the mind itself. In Chapter XXVIII I shall at considerable length defend the mind's claim to originality and fertility in bringing them forth. But no single one of the mind's conceptions is fertile *of itself* as the opinion which I criticise pretends. When the several notes of a chord are sounded together, we get a new feeling from their combination. This feeling is due to the mind reacting upon that group of sounds in that determinate way, and no one would think of saying of any single note of the chord that it 'developed' of itself into the other notes or into the feeling of harmony. So of Conceptions. No one of them develops into any other. But if two of them are thought at once, their *relation* may come to consciousness, and form matter for a third conception. [Pg 466]

Take 'thirteen' for example, which is said to develop into 'prime.' What really happens is that we compare the utterly changeless conception of thirteen with various other conceptions, those of the different multiples of two, three, four, five, and six, and ascertain that it *differs* from them all. Such difference is a freshly ascertained relation. It is only for mere brevity's sake that we call it a property of the original thirteen, the property of being prime. We shall see in the next chapter that (if we count out æsthetic and moral relations between things) the only important relations of which the mere inspection of conceptions makes us aware are relations of comparison, that is, of difference and no-difference, between them. The judgment $6 + 7 = 13$ expresses the relation of *equality* between two ideal objects, 13 on the one hand and $6 + 7$ on the other, successively conceived and compared. The judgments $6 + 7 > 12$, or $6 + 7 < 14$, express in like manner relations of inequality between ideal objects. But if it be unfair to say that the conception of $6 + 7$ generates that of 12 or of 14, surely it is as unfair to say that it generates that of 13.

The conceptions of 12, 13, and 14 are each and all generated by individual acts of the mind, playing with its materials. When, comparing two ideal objects, we find them equal, the conception of one of them may be that of a whole and of the other that of all its parts. This particular case is, it seems to me, the only case which makes the notion of one conception evolving into another sound plausible. But even in this case the conception, as such, of the whole does not evolve into the conception, as such, of the parts. Let the conception of some object as a whole be given first. To begin with, it points to and identifies for future thought a certain *that*. The 'whole' in question might be one of those mechanical puzzles of which the difficulty is to unlock the parts. In this case, nobody would pretend that the richer and more elaborate conception which we gain of the puzzle after solving it came directly out of our first crude conception of it, for it is notoriously the outcome of experimenting with our [Pg 467]

hands. It is true that, as they both mean *that same puzzle*, our earlier thought and our later thought have one conceptual function, are vehicles of one conception. But in addition to being the vehicle of this bald unchanging conception, 'that same puzzle,' the later thought is the vehicle of all those other conceptions which it took the manual experimentation to acquire. Now, it is just the same where the whole is mathematical instead of being mechanical. Let it be a polygonal space, which we cut into triangles, and of which we then affirm that it *is* those triangles. Here the experimentation (although usually done by a pencil in the hands) may be done by the unaided imagination. We hold the space, first conceived as polygonal simply, in our mind's eye until our attention wandering to and fro within it has carved it into the triangles. The triangles are a new conception, the result of this new operation. Having once conceived them, however, and compared them with the old polygon which we originally conceived and which we have never ceased conceiving, we judge them to fit exactly into its area. The earlier and later conceptions, we say, are of one and the same space. But this relation between triangles and polygon which the mind cannot help finding if it compares them at all, is very badly expressed by saying that the old conception has developed into the new. New conceptions come from new sensations, new movements, new emotions, new associations, new acts of attention, and new comparisons of old conceptions, and not in other ways. Endogenous proliferation is not a mode of growth to which conceptions can lay claim.

I hope, therefore, that I shall not be accused of huddling mysteries out of sight, when I insist that the psychology of conception is not the place in which to treat of those of continuity and change. Conceptions form the one class of entities that cannot under any circumstances change. They can cease to be, altogether; or they can stay, as what they severally are; but there is for them no middle way. They form an essentially discontinuous system, and translate the process of our perceptual experience, which is naturally a flux, into a set of stagnant and petrified terms. The very conception of flux itself is an absolutely changeless meaning in the mind: it signifies just that one thing, flux, immovably.—And, with this, the doctrine of the flux of the concept may be dismissed, and need not occupy our attention again.^[391]

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'ABSTRACT' IDEAS.

We have now to pass to a less excusable mistake. There are philosophers who deny that associated things can be broken asunder at all, even provisionally, by the conceiving mind. The opinion known as Nominalism says that we really never frame any conception of the partial elements of an experience, but are compelled, whenever we think it, to think it in its totality, just as it came.

I will be silent of mediæval Nominalism, and begin with Berkeley, who is supposed to have rediscovered the doctrine for himself. His asseverations against 'abstract ideas' are among the oftenest quoted passages in philosophic literature.

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"It is agreed," he says, "on all hands that the qualities or modes of things do never really exist each of them apart by itself, and separated from all others, but are mixed, as it were, and blended together, several in the same object. But, we are told, the mind being able to consider each quality singly, or abstracted from those other qualities with which it is united, does by that means frame to itself abstract ideas.... After this manner, it is said, we come by the abstract idea of man, or, if you please, humanity, or human nature; wherein it is true there is included color, because there is no man but has some color, but then it can be neither white, nor black, nor any particular color, because there is no one particular color wherein all men partake. So likewise there is included stature, but then it is neither tall stature nor low stature, nor yet middle stature, but something abstracted from all these. And so of the rest.... Whether others have

this wonderful faculty of abstracting their ideas, they best can tell: for myself, I find indeed I have a faculty of imagining or representing to myself the ideas of those particular things I have perceived and of variously compounding and dividing them.... I can consider the hand, the eye, the nose, each by itself abstracted or separated from the rest of the body. But then, whatever hand or eye I imagine, it must have some particular shape and color. Likewise the idea of man that I frame to myself must be either of a white, or a black, or a tawny, a straight, or a crooked, a tall, or a low, or a middle-sized man. I cannot by any effort of thought conceive the abstract idea above described. And it is equally impossible for me to form the abstract idea of motion distinct from the body moving, and which is neither swift nor slow, curvilinear nor rectilinear; and the like may be said of all other abstract general ideas whatsoever.... And there is ground to think most men will acknowledge themselves to be in my case. The generality of men which are simple and illiterate never pretend to abstract notions. It is said they are difficult, and not to be attained without pains and study.

"Now I would fain know at what time it is men are employed in surmounting that difficulty, and furnishing themselves with those necessary helps for discourse. It cannot be when they are grown up, for then it seems they are not conscious of any such painstaking; it remains therefore to be the business of their childhood. And surely the great and multiplied labor of framing abstract notions will be found a hard task for that tender age. Is it not a hard thing to imagine that a couple of children cannot prate together of their sugar-plums and rattles and the rest of their little trinkets, till they have first tacked together numberless inconsistencies, and so framed in their minds abstract general ideas, and annexed them to every common name they make use of?"^[392]

The note, so bravely struck by Berkeley, could not, however, be well sustained in face of the fact patent to every human being that we *can* mean color without meaning any particular color, and stature without meaning any particular height. James Mill, to be sure, chimes in heroically in the chapter on Classification of his 'Analysis'; but in his son John the nominalistic voice has grown so weak that, although 'abstract ideas' are repudiated as a matter of traditional form, the opinions uttered are really nothing but a conceptualism ashamed to call itself by its own legitimate name.^[393] Conceptualism says the mind can conceive any quality or relation it pleases, and mean nothing but it, in isolation from everything else in the world. This is, of course, the doctrine which we have professed. John Mill says:

"The formation of a Concept does not consist in separating the attributes which are said to compose it from all other attributes of the same object, and enabling us to conceive those attributes, disjoined from any others. We neither conceive them, nor think them, nor cognize them in any way, as a thing apart, but solely as forming, in combination with numerous other attributes, the idea of an individual object. But, though meaning them only as part of a larger agglomeration, we have the power of fixing our attention on them, to the neglect of the other attributes with which we think them combined. *While the concentration of attention lasts, if it is sufficiently intense, we may be temporarily unconscious of any of the other attributes, and may really, for a brief interval, have nothing-present to our mind but the attributes constituent of the concept....* General concepts, therefore, we have, properly speaking, none; we have only complex ideas of objects in the concrete: but we are able to *attend exclusively to certain parts* of the concrete idea: and by that *exclusive attention* we enable those parts to *determine exclusively the course of our thoughts* as

subsequently called up by association; and are in a condition to carry on a train of meditation or reasoning relating to those parts only, *exactly as if* we were able to *conceive* them separately from the rest."^[394]

This is a lovely example of Mill's way of holding piously to his general statements, but conceding in detail all that their adversaries ask. If there be a better description extant, of a mind in possession of an 'abstract idea,' than is contained in the words I have italicized, I am unacquainted with it. The Berkeleyan nominalism thus breaks down. [Pg 471]

It is easy to lay bare the false assumption which underlies the whole discussion of the question as hitherto carried on. That assumption is that ideas, in order to know, must be cast in the exact likeness of whatever things they know, and that the only things that can be known are those which ideas can resemble. The error has not been confined to nominalists. *Omnis cognitio fit per assimilationem cognoscentis et cogniti* has been the maxim, more or less explicitly assumed, of writers of every school. Practically it amounts to saying that an idea must *be* a duplicate edition of what it knows^[395]—in other words, that it can only know itself—or, more shortly still, that knowledge in any strict sense of the word, as a self-transcendent function, is impossible.

Now our own blunt statements about the ultimateness of the cognitive relation, and the difference between the 'object' of the thought and its mere 'topic' or 'subject of discourse' (cf. [pp. 275 ff.](#)), are all at variance with any such theory; and we shall find more and more occasion, as we advance in this book, to deny its general truth. All that a state of mind need do, in order to take cognizance of a reality, intend it, or be 'about' it, is to lead to a remoter state of mind which either acts upon the reality or resembles it. The only class of thoughts which can with any show of plausibility be said to resemble their objects are sensations. The stuff of which all our other thoughts are composed is symbolic, and a thought attests its pertinency to a topic by simply *terminating*, sooner or later, in a sensation which resembles the latter.

But Mill and the rest believe that a thought must *be* what it means, and mean what it *is*, and that if it be a picture of an entire individual, it cannot mean any part of him to the exclusion of the rest. I say nothing here of the preposterously false descriptive psychology involved in the statement that the only things we can mentally picture are individuals completely determinate in all regards. Chapter XVIII will have something to say on that point, and we can ignore it here. For even if it were true that our images were always of concrete individuals, it would not in the least follow that our meanings were of the same. [Pg 472]

The sense of our meaning is an entirely peculiar element of the thought. It is one of those evanescent and 'transitive' facts of mind which introspection cannot turn round upon, and isolate and hold up for examination, as an entomologist passes round an insect on a pin. In the (somewhat clumsy) terminology I have used, it pertains to the 'fringe' of the subjective state, and is a 'feeling of tendency,' whose neural counterpart is undoubtedly a lot of dawning and dying processes too faint and complex to be traced. The geometer, with his one definite figure before him, knows perfectly that his thoughts apply to countless other figures as well, and that although he *sees* lines of a certain special bigness, direction, color, etc., he *means* not one of these details. When I use the word *man* in two different sentences, I may have both times exactly the same sound upon my lips and the same picture in my mental eye, but I may mean, and at the very moment of uttering the word and imagining the picture, know that I mean, two entirely different things. Thus when I say: "What a wonderful man Jones is!" I am perfectly aware that I mean by man to exclude Napoleon Bonaparte or Smith. But when I say: "What a wonderful thing Man is!" I am equally well aware that I mean to *include* not only Jones, but Napoleon and Smith as well. This added consciousness

is an absolutely positive sort of feeling, transforming what would otherwise be mere noise or vision into something *understood*; and determining the sequel of my thinking, the later words and images, in a perfectly definite way. We saw in [Chapter IX](#) that the image *per se*, the nucleus, is *functionally* the least important part of the thought. *Our doctrine, therefore, of the 'fringe' leads to a perfectly satisfactory decision of the nominalistic and conceptualistic controversy*, so far as it touches psychology. *We must decide in favor of the conceptualists*, and affirm that the power to think things, qualities, relations, or whatever other elements there may be, isolated and abstracted from the total experience in which they appear, is the most indisputable function of our thought.

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UNIVERSALS.

After abstractions, universals! The 'fringe,' which lets us believe in the one, lets us believe in the other too. An individual conception is of something restricted, in its application, to a single case. A universal or general conception is of an entire class, or of something belonging to an entire class, of things. The conception of an abstract quality is, taken by itself, neither universal nor particular.^[396] If I abstract *white* from the rest of the wintry landscape this morning, it is a perfectly definite conception, a self-identical quality which I may mean again; but, as I have not yet individualized it by expressly meaning to restrict it to this particular snow, nor thought at all of the possibility of other things to which it may be applicable, it is so far nothing but a 'that,' a 'floating adjective,' as Mr. Bradley calls it, or a topic broken out from the rest of the world. Properly it is, in this state, a singular—I have 'singled it out;' and when, later, I universalize or individualize its application, and my thought turns to mean either *this white* or *all possible whites*, I am in reality meaning two new things and forming two new conceptions.^[397] Such an alteration of my meaning has nothing to do with any change in the image I may have in my mental eye, but solely with the vague consciousness that surrounds the image, of the sphere to which it is intended to apply. We can give no more definite account of this vague consciousness than has been given on [pp. 249-266](#). But that is no reason for denying its presence.^[398]

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But the nominalists and traditional conceptualists find matter for an inveterate quarrel in these simple facts. Full of their notion that an idea, feeling, or state of consciousness can at bottom only be aware of its own quality; and agreeing, as they both do, that such an idea or state of consciousness is a perfectly determinate, singular, and transitory thing; they find it impossible to conceive how it should become the vehicle of a knowledge of anything permanent or universal. "To know a universal, it must be universal; for like can only be known by like," etc. Unable to reconcile these incompatibles, the knower and the known, each side immolates one of them to save the other. The nominalists 'settle the hash' of the thing known by denying it to be ever a genuine universal; the conceptualists despatch the knower by denying it to be a state of mind, in the sense of being a perishing segment of thoughts' stream, consubstantial with other facts of sensibility. They invent, instead of it, as the vehicle of the knowledge of universals, an *actus purus intellectus*, or an Ego, whose function is treated as quasi-miraculous and nothing if not awe-inspiring, and which it is a sort of blasphemy to approach with the intent to explain and make common, or reduce to lower terms. Invoked in the first instance as a vehicle for the knowledge of universals, the higher principle presently is made the indispensable vehicle of all thinking whatever, for, it is contended, "a universal element is present in every thought." The nominalists meanwhile, who dislike *actus purus* and awe-inspiring principles and despise the reverential mood, content themselves with saying that we are mistaken in supposing we ever get sight of the face of an universal; and that what deludes us is nothing but the swarm of 'individual ideas' which may at any time be awakened by the hearing of a name.

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If we open the pages of either school, we find it impossible to tell, in all the whirl about universal and particular, when the author is talking about universals in the mind, and when

about objective universals, so strangely are the two mixed together. James Ferrier, for example, is the most brilliant of anti-nominalist writers. But who is nimble-witted enough to count, in the following sentences from him, the number of times he steps from the known to the knower, and attributes to both whatever properties he finds in either one?

"To think is to pass from the singular or particular to the idea [concept] or universal.... Ideas are necessary because no thinking can take place without them. They are universal, inasmuch as they are completely divested of the particularity which characterizes all the phenomena of mere sensation. To grasp the nature of this universality is not easy. Perhaps the best means by which this end may be compassed is by contrasting it with the particular. It is not difficult to understand that a sensation, a phenomenon of sense, is never more than the particular which it is. As such, that is, in its strict particularity, it is absolutely unthinkable. In the very act of being thought, something more than it emerges, and this something more cannot be again the particular.... Ten particulars *per se* cannot be thought of any more than one particular can be thought of;... there always emerges in thought an additional something, which is the possibility of other particulars to an indefinite extent.... The indefinite additional something which they are instances of is a universal.... The idea or universal cannot possibly be pictured in the imagination, for this would at once reduce it to the particular.... This inability to form any sort of picture or representation of an idea does not proceed from any imperfection or limitation of our faculties, but is a quality inherent in the very nature of intelligence. A contradiction is involved in the supposition that an idea or a universal can become the object either of sense or of the imagination. An idea is thus diametrically opposed to an image."^[399]

The nominalists, on their side, admit a *quasi*-universal, something which we think *as if it were* universal, though it is not; and in all that they say about this something, which they explain to be 'an indefinite number of particular ideas,' the same vacillation between the subjective and the objective points of view appears. The reader never can tell whether an 'idea' spoken of is supposed to be a knower or a known. The authors themselves do not distinguish. They want to get something in the mind which shall *resemble* what is out of the mind, however vaguely, and they think that when that fact is accomplished, no farther questions will be asked. James Mill writes:^[400]

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"The word, man, we shall say, is first applied to an individual; it is first associated with the idea of that individual, and acquires the power of calling up the idea of him; it is next applied to another individual and acquires the power of calling up the idea of him; so of another and another, till it has become associated with an indefinite number, and has acquired the power of calling up an indefinite number of those ideas indifferently. What happens? It does call up an indefinite number of the ideas of individuals as often as it occurs; and calling them in close connection, it forms a species of complex idea of them.... It is also a fact, that when an idea becomes to a certain extent complex, from the multiplicity of the ideas it *comprehends*, it is of necessity indistinct;... and this indistinctness has, doubtless, been a main cause of the mystery which has appeared to belong to it.... It thus appears that the word *man* is not a word having a very simple idea, as was the opinion of the realists; nor a word having no idea at all, as was that of the [earlier] nominalists; but a word calling up an indefinite number of ideas, by the irresistible laws of association, and forming them into one very complex and indistinct, but not therefore unintelligible, idea."

Berkeley had already said:^[401]

"A word becomes general by being made the sign, not of an abstract general idea, but of many several particular ideas, any one of which it indifferently suggests to the mind. An idea which, considered in itself, is particular, becomes general by being made to represent or stand for all other particular ideas of the same sort."

'Stand for,' not *know*; 'becomes general,' not becomes *aware of something* general; 'particular ideas,' not particular *things*—everywhere the same timidity about begging the fact of knowing, and the pitifully impotent attempt to foist it in the shape of a mode of *being* of 'ideas.' If the fact to be conceived be the indefinitely numerous actual and possible members of a class, then it is assumed that if we can only get enough ideas to huddle together for a moment in the mind, the *being* of each several one of them there will be an equivalent for the *knowing*, or *meaning*, of *one* member of the class in question; and their number will be so large as to confuse our tally and leave it doubtful whether all the possible members of the class have thus been satisfactorily told off or not.

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Of course this is nonsense. An idea neither is what it knows, nor knows what it is; nor will swarms of copies of the same 'idea,' recurring in stereotyped form, or 'by the irresistible laws of association formed into one idea,' ever be the same thing as a thought of '*all the possible members*' of a class. We must mean *that* by an altogether special bit of consciousness *ad hoc*. But it is easy to translate Berkeley's, Hume's, and Mill's notion of a swarm of ideas into cerebral terms, and so to make them stand for something real; and, in this sense, I think the doctrine of these authors less hollow than the opposite one which makes the vehicle of universal conceptions to be an *actus purus* of the soul. If each 'idea' stand for some special nascent nerve-process, then the aggregate of these nascent processes might have for its conscious correlate a psychic 'fringe,' which should be just that universal meaning, or intention that the name or mental picture employed should mean all the possible individuals of the class. Every peculiar complication of brain-processes must have some peculiar correlate in the soul. To one set of processes will correspond the thought of an indefinite taking of the extent of a word like *man*; to another set that of a particular taking; and to a third set that of a universal taking, of the extent of the same word. The thought corresponding to either set of processes, is always itself a unique and singular event, whose dependence on its peculiar nerve-process I of course am far from professing to explain.^[402]

Truly in comparison with the fact that every conception, whatever it be of, is one of the mind's immutable possessions, the question whether a single thing, or a whole class of things, or only an unassigned quality, be meant by it, is an insignificant matter of detail. Our meanings are of singulars, particulars, indefinites, and universals, mixed together in every way. A singular individual is as much *conceived* when he is isolated and identified away from the rest of the world in my mind, as is the most rarefied and universally applicable quality he may possess—*being*, for example, when treated in the same way.^[403]

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From every point of view, the overwhelming and portentous character ascribed to universal conceptions is surprising. Why, from Plato and Aristotle downwards, philosophers should have vied with each other in scorn of the knowledge of the particular, and in adoration of that of the general, is hard to understand, seeing that the more adorable knowledge ought to be that of the more adorable things, and that the *things* of worth are all concretes and singulars. The only value of universal characters is that they help us, by reasoning, to know new truths about individual things. The restriction of one's meaning, moreover, to an individual thing, probably requires even more complicated brain-processes than its extension to all the instances of a kind; and the mere mystery, as such, of the knowledge, is equally great, whether generals or singulars be the things known. In sum, therefore, the traditional universal-worship can only be called a bit of perverse sentimentalism, a philosophic 'idol of the cave.'

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It may seem hardly necessary to add (what follows as a matter of course from [pp. 229-237](#), and what has been implied in our assertions all along) that *nothing can be conceived twice over without being conceived in entirely different states of mind*. Thus, my arm-chair is one of the things of which I have a conception; I knew it yesterday and recognized it when I looked at it. But if I think of it to-day as the same arm-chair which I looked at yesterday, it is obvious that the very conception of it as the same is an additional complication to the thought, whose inward constitution must alter in consequence. In short, it is logically impossible that the same thing should be *known as the same* by two successive copies of the same thought. As a matter of fact, the thoughts by which we know that we mean the same thing are apt to be very different indeed from each other. We think the thing now in one context, now in another; now in a definite image, now in a symbol. Sometimes our sense of its identity pertains to the mere fringe, sometimes it involves the nucleus, of our thought. We never can break the thought asunder and tell just which one of its bits is the part that lets us know which subject is referred to; but nevertheless we always *do* know which of all possible subjects we have in mind. Introspective psychology must here throw up the sponge; the fluctuations of subjective life are too exquisite to be arrested by its coarse means. It must confine itself to bearing witness to the fact that all sorts of different subjective states do form the vehicle by which the same is known; and it must contradict the opposite view.

The ordinary Psychology of 'ideas' constantly talks as if the vehicle of the same thing-known must be the same recurrent state of mind, and as if the having over again of the same 'idea' were not only a necessary but a sufficient condition for meaning the same thing twice. But this recurrence of the same idea would utterly defeat the existence of a repeated knowledge of anything. It would be a simple reversion into a pre-existent state, with nothing gained in the interval, and with complete unconsciousness of the state having existed before. Such is not the way in which we think. As a rule we are fully aware that we have thought before of the thing we think of now. The continuity and permanency of the topic is of the essence of our intellection. We recognize the old problem, and the old solutions; and we go on to alter and improve and substitute one predicate for another without ever letting the subject change.

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This is what is meant when it is said that thinking consists in making *judgments*. A succession of judgments may all be about the same thing. The general practical postulate which encourages us to keep thinking at all is that by going on to do so we shall judge better *of the same things* than if we do not.^[404] In the successive judgments, all sorts of new operations are performed on the things, and all sorts of new results brought out, without the sense of the main topic ever getting lost. At the outset, we merely *have* the topic; then we *operate* on it; and finally we have it again in a richer and truer way. A compound conception has been substituted for the simple one, but with full consciousness that both are of the Same.

The distinction between having and operating is as natural in the mental as in the material world. As our hands may hold a bit of wood and a knife, and yet do naught with either; so our mind may simply be aware of a thing's existence, and yet neither attend to it nor discriminate it, neither locate nor count nor compare nor like nor dislike nor deduce it, nor recognize it articulately as having been met with before. At the same time we know that, instead of staring at it in this entranced and senseless way, we may rally our activity in a moment, and locate, class, compare, count, and judge it. There is nothing involved in all this which we did not postulate at the very outset of our introspective work: realities, namely, *extra mentem*, thoughts, and possible relations of cognition between the two. The result of the thoughts' operating on the data given to sense is to transform the order in which experience *comes* into an entirely different order, that of the *conceived* world. There is no spot of light, for example, which I pick out and proceed to define as a pebble, which is not thereby torn from its mere time- and space-neighbors, and thought in conjunction with

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things physically parted from it by the width of nature. Compare the form in which facts appear in a text-book of physics, as logically subordinated laws, with that in which we naturally make their acquaintance. The conceptual scheme is a sort of sieve in which we try to gather up the world's contents. Most facts and relations fall through its meshes, being either too subtle or insignificant to be fixed in any conception. But whenever a physical reality is caught and identified as the same with something already conceived, it remains on the sieve, and all the predicates and relations of the conception with which it is identified become its predicates and relations too; it is subjected to the sieve's network, in other words. Thus comes to pass what Mr. Hodgson calls the translation of the perceptual into the conceptual order of the world.^[405] In Chapter XXII we shall see how this translation always takes place for the sake of some subjective *interest*, and how the conception with which we handle a bit of sensible experience is really nothing but a teleological instrument. *This whole function of conceiving, of fixing, and holding fast to meanings, has no significance apart from the fact that the conceiver is a creature with partial purposes and private ends.* There remains, therefore, much more to be said about conception, but for the present this will suffice.

[386] There are two other 'principles of identity' in philosophy. The *ontological* one asserts that every real thing is what it is, that *a* is *a*, and *b*, *b*. The *logical* one says that what is once true of the subject of a judgment is always true of that subject. The ontological law is a tautological truism; the logical principle is already more, for it implies subjects unalterable by time. The *psychological* law also implies facts which might not be realized: there might be no succession of thoughts; or if there were, the later ones might not think of the earlier; or if they did, they might not recall the content thereof; or, recalling the content, they might not take it as 'the same' with anything else.

[387] In later chapters we shall see that determinate relations exist between the various data thus fixed upon by the mind. These are called *a priori* or axiomatic relations. Simple inspection of the data enables us to perceive them; and one inspection is as effective as a million for engendering in us the conviction that between *those* data that relation must always hold. To change the relation we should have to make the data different. 'The guarantee for the uniformity and adequacy' of the data can only be the mind's own power to fix upon any objective content, and to mean that content as often as it likes. This right of the mind to 'construct' permanent ideal objects for itself out of the data of experience seems, singularly enough, to be a stumbling-block to many. Professor Robertson in his clear and instructive article 'Axioms' in the *Encyclopædia Britannica* (9th edition) suggests that it may only be where *movements* enter into the constitution of the ideal object (as they do in geometrical figures) that we can "*make* the ultimate relations to be what for us they must be in all circumstances." He makes, it is true, a concession in favor of conceptions of number abstracted from "subjective occurrences succeeding each other in time" because these also are acts "of construction, dependent on the power we have of voluntarily determining the flow of subjective consciousness." "The content of passive sensation," on the other hand, "may indefinitely vary beyond any control of ours." What if it do vary, so long as we can continue to think of and mean the qualities it varied from? We can 'make' ideal objects for ourselves out of irrecoverable bits of passive experience quite as perfectly as out of easily repeatable active experiences. And when we have got our objects together and compared them, we do not *make*, but *find*, their relations.

[388] Cf. Hodgson, *Time and Space*, § 46. Lotze, *Logic*, § 11.

[389] "For though a man in a fever should from sugar have a bitter taste which at another time would produce a sweet one, yet the idea of bitter in that man's mind

would be as distinct as if he had tasted only gall." (Locke's Essay bk. ii, chap. xi, § 3. Read the whole section!)

- [390] Black round things, square white things, *per contra*, Nature gives us freely enough. But the combinations which she refuses to realize may exist as distinctly, in the shape of postulates, as those which she gives may exist in the shape of positive images, in our mind. As a matter of fact, she *may* realize a warm cold thing whenever two points of the skin, so near together as not to be locally distinguished, are touched, the one with a warm, the other with a cold, piece of metal. The warmth and the cold are then often felt as if in the same objective place. Under similar conditions two objects, one sharp and the other blunt, may feel like one sharp blunt thing. The same space may appear of two colors if, by optical artifice, one of the colors is made to appear as if seen *through* the other.— Whether any two attributes whatever shall be compatible or not, in the sense of appearing or not to occupy the same place and moment, depends simply on *de facto* peculiarities of natural bodies and of our sense-organs. *Logically*, anyone combination of qualities is to the full as *conceivable* as any other, and has as distinct a meaning for thought. What necessitates this remark is the confusion deliberately kept up by certain authors (e.g. Spencer, Psychology, §§ 420-7) between the inconceivable and the not-distinctly-imaginable. How do we know *which* things we cannot imagine unless by first conceiving them, meaning *them* and not other things?
- [391] Arguments seldom make converts in matters philosophical; and some readers, I know, who find that they conceive a certain matter differently from what they did, will still prefer saying they have two different editions of the same conception, one evolved from the other, to saying they have two different conceptions of the same thing. It depends, after all, on how we define conception. We ourselves defined it as the function by which a state of mind means to think the same whereof it thought on a former occasion. Two states of mind will accordingly be two editions of the same conception just so far as either does mean to think what the other thought; but no farther. If either mean to think what the other did not think, it is a different conception from the other. And if either mean to think all that the other thought, *and more*, it is a different conception, so far as the *more* goes. In this last case one state of mind has two conceptual functions. Each thought decides, by its own authority, which, out of all the conceptive functions open to it, it shall now renew; with which other thought it shall identify itself as a conceiver, and just how far. "The same A which I once meant," it says, "I shall now mean again, and mean it with C as its predicate (or what not) instead of B, as before." In all this, therefore, there is absolutely no changing, but only uncoupling and recoupling of conceptions. Compound conceptions come, as functions of new states of mind. Some of these functions are the same with previous ones, some not. Any changed opinion, then, *partly* contains new editions (absolutely identical with the old, however) of former conceptions, *partly* absolutely new conceptions. The division is a perfectly easy one to make in each particular case.
- [392] Principles of Human Knowledge, Introduction, §§ 10, 14.
- [393] 'Conceptualisme honteux,' Rabier, Psychologie, 310.
- [394] Exam. of Hamilton, p. 393. Cf. also Logic, bk. ii, chap. v, § 1, and bk iv, chap ii, § 1.
- [395] E.g.: "The knowledge of things must mean that the mind finds itself in them, or that, in some way, the difference between them and the mind is dissolved." (E. Caird, Philosophy of Kant, first edition, p. 553.)
- [396] The traditional conceptualist doctrine is that an abstract must *eo ipso* be a universal. Even modern and independent authors like Prof. Dewey (Psychology, 207) obey the tradition: "The mind seizes upon some one aspect,... abstracts or prescind it. This very seizure of some one element generalizes the one

abstracted.... Attention, in drawing it forth, makes it a distinct content of consciousness, and thus universalizes it; it is considered no longer in its particular connection with the object, but on its own account; that is, as an idea, or what it signifies to the mind; and significance is always universal."

- [397] C. F. Reid's Intellectual Powers, Essay v, chap. iii.—*Whiteness* is one thing, *the whiteness of this sheet of paper* another thing.
- [398] Mr. F. H. Bradley says the conception or the 'meaning' "consists of a part of the content, cut off, fixed by the mind, and considered apart from the existence of the sign. It would not be correct to add, and referred away to another real subject; for where we think without judging, and where we deny, that description would not be applicable." This seems to be the same doctrine as ours; the application to one or to all subjects of the abstract fact conceived (i.e. its individuality or its universality), constituting a new conception. I am, however, not quite sure that Mr. Bradley steadily maintains this ground. Cf. the first chapter of his Principles of Logic. The doctrine I defend is stoutly upheld in Rosmini's Philosophical System, Introduction by Thomas Davidson, p. 43 (London, 1882).
- [399] Lectures on Greek Philosophy, pp. 33-39.
- [400] Analysis, chap. viii.
- [401] Principles of Human Knowledge, Introduction, §§ 11, 12.
- [402] It may add to the effect of the text to quote a passage from the essay in 'Mind,' referred to on [p. 224](#).

"Why may we not side with the conceptualists in saying that the universal sense of a word does correspond to a mental fact of *some* kind, but at the same time, agreeing with the nominalists that all mental facts are modifications of subjective sensibility, why may we not call that fact a 'feeling'? *Man* meant for *mankind* is in short a different feeling from *man* as a mere noise, or from *man* meant for *that* man, to wit, John Smith alone. Not that the difference consists simply in the fact that, when taken universally, the word has one of Mr. Galton's 'blended' images of man associated with it. Many persons have seemed to think that these blended or, as Prof. Huxley calls them, 'generic' images are equivalent to concepts. But, in itself, a blurred thing is just as particular as a sharp thing; and the generic character of either sharp image or blurred image depends on its being felt *with its representative function*. This function is the mysterious *plus*, the understood meaning. But it is nothing applied to the image from above, no pure act of reason inhabiting a supersensible and semi-supernatural plane. It can be diagrammatized as continuous with all the other segments of the subjective stream. It is just that staining, fringe, or halo of obscurely felt relation to masses of other imagery about to come, but not yet distinctly in focus, which we have so abundantly set forth [in [Chapter IX](#)].

"If the image come unfringed, it reveals but a simple quality, thing, or event; if it come fringed, it may reveal something expressly taken universally or in a scheme of relations. The difference between thought and feeling thus reduces itself, in the last subjective analysis, to the presence or absence of 'fringe.' And this in turn reduces itself, with much probability, in the last physiological analysis, to the absence or presence of sub-excitements in other convolutions of the brain than those whose discharges underlie the more definite nucleus, the substantive ingredient, of the thought,—in this instance, the word or image it may happen to arouse.

"The contrast is not, then, as the Platonists would have it, between certain subjective facts called images and sensations, and others called acts of relating intelligence; the former being blind perishing things, knowing not even their own existence as such, whilst the latter combine the poles in the mysterious synthesis of their cognitive sweep. The contrast is really between two *aspects*, in which all

mental facts without exception may be taken; their structural aspect, as being subjective, and their functional aspect, as being cognitions. In the former aspect, the highest as well as the lowest is a feeling, a peculiarly tinged segment of the stream. This tingeing is its sensitive body, the *wie ihm zu Muthe ist*, the way it feels whilst passing. In the latter aspect, the lowest mental fact as well as the highest may grasp some bit of truth as its content, even though that truth were as relationless a matter as a bare unlocalized and undated quality of pain. From the cognitive point of view, all mental facts are intellections. From the subjective point of view all are feelings. Once admit that the passing and evanescent are as real parts of the stream as the distinct and comparatively abiding; once allow that fringes and halos, inarticulate perceptions, whereof the objects are as yet unnamed, mere nascencies of cognition, premonitions, awarenesses of direction, are thoughts *sui generis*, as much as articulate imaginings and propositions are; once restore, I say, the *vague* to its psychological rights, and the matter presents no further difficulty.

"And then we see that the current opposition of Feeling to Knowledge is quite a false issue. If every feeling is at the same time a bit of knowledge, we ought no longer to talk of mental states differing by having more or less of the cognitive quality; they only differ in knowing more or less, in having much fact or little fact for their object. The feeling of a broad scheme of relations is a feeling that knows much; the feeling of a simple quality is a feeling that knows little. But the knowing itself, whether of much or of little, has the same essence, and is as good knowing in the one case as in the other. Concept and image, thus discriminated through their objects, are consubstantial in their inward nature, as modes of feeling. The one, as particular, will no longer be held to be a relatively base sort of entity, to be taken as a matter of course, whilst the other, as universal, is celebrated as a sort of standing miracle, to be adored but not explained. Both concept and image, *quâ* subjective, are singular and particular. Both are moments of the stream, which come and in an instant are no more. The word universality has no meaning as applied to their psychic body or structure, which is always finite. It only has a meaning when applied to their use, import, or reference to the kind of object they may reveal. The representation, as such, of the universal object is as particular as that of an object about which we know so little that the interjection 'Ha!' is all it can evoke from us in the way of speech. Both should be weighed in the same scales, and have the same measure meted out to them whether of worship or of contempt." (Mind, ix, pp. 18-19.)

[403] Hodgson, Time and Space, p. 404.

[404] Compare the admirable passage in Hodgson's Time and Space, p. 310.

[405] Philosophy of Reflection, i, 273-308.

CHAPTER XIII.

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DISCRIMINATION AND COMPARISON.

It is matter of popular observation that some men have sharper senses than others, and that some have acuter minds and are able to 'split hairs' and see two shades of meaning where the majority see but one. Locke long ago set apart the faculty of discrimination as one in which men differ individually. What he wrote is good enough to quote as an introduction to this chapter:

"Another faculty we may take notice of in our minds is that of discerning and distinguishing between the several ideas it has. It is not enough to have a

confused perception of something in general: unless the mind had a distinct perception of different objects and their qualities, it would be capable of very little knowledge; though the bodies that affect us were as busy about us as they are now, and the mind were continually employed in thinking. On this faculty of distinguishing one thing from another depends the evidence and certainty of several even very general propositions, which have passed for innate truths; because men, overlooking the true cause why those propositions find universal assent, impute it wholly to native uniform impressions; whereas it in truth depends upon this clear discerning faculty of the mind, whereby it perceives two ideas to be the same or different. But of this more hereafter?

"How much the imperfection of accurately discriminating ideas one from another lies either in the dulness or faults of the organs of sense, or want of acuteness, exercise, or attention in the understanding, or hastiness and precipitancy natural to some tempers, I will not here examine: it suffices to take notice that this is one of the operations that the mind may reflect on and observe in itself. It is of that consequence to its other knowledge, that so far as this faculty is in itself dull, or not rightly made use of for the distinguishing one thing from another, so far our notions are confused, and our reason and judgment disturbed or misled. If in having our ideas in the memory ready at hand consists quickness of parts; in this of having them unconfused, and being able nicely to distinguish one thing from another where there is but the least difference, consists in a great measure the exactness of judgment and clearness of reason which is to be observed in one man above another. And hence, perhaps, may be given some reason of that common observation,—that men who have a great deal of wit and prompt memories have not always the clearest judgment or deepest reason. For, wit lying most in the assemblage of ideas, and putting those together with quickness and variety wherein can be found any resemblance or congruity, thereby to make up pleasant pictures and agreeable visions in the fancy; judgment, on the contrary, lies quite on the other side, in separating carefully one from another ideas wherein can be found the least difference, thereby to avoid being misled by similitude and by affinity to take one thing for another. This is a way of proceeding quite contrary to metaphor and allusion, wherein for the most part lies that entertainment and pleasantry of wit which strikes so lively on the fancy, and therefore, so acceptable to all people because its beauty appears at first sight, and there is required no labor of thought to examine what truth or reason there is in it."^[406]

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But Locke's descendants have been slow to enter into the path whose fruitfulness was thus pointed out by their master, and have so neglected the study of discrimination that one might almost say that the classic English psychologists have, as a school, hardly recognized it to exist. 'Association' has proved itself in their hands the one all-absorbing power of the mind. Dr. Martineau, in his review of Bain, makes some very weighty remarks on this onesidedness of the Lockian school. Our mental history, says he, is, in its view,

"a perpetual formation of new compounds: and the words 'association,' 'cohesion,' 'fusion,' 'indissoluble connection,' all express the change from plurality of data to some unity of result. An explanation of the process therefore requires two things: a true enumeration of the primary constituents, and a correct statement of their laws of combination: just as, in chemistry, we are furnished with a list of the simple elements, and the with then principles of their synthesis. Now the latter of these two conditions we find satisfied by the association-psychologists: but not the former. They are not agreed upon their catalogue of elements, or the marks by which they may know the simple from the compound. The psychological unit is not fixed; that which is called one

impression by Hartley is treated as half-a-dozen or more by Mill: and the tendency of the modern teachers on this point is to recede more and more from the better-chosen track of their master. Hartley, for example, regarded the whole present effect upon us of any single object—say, an orange—as a single sensation; and the whole vestige it left behind, as a single 'idea of sensation.' His modern disciples, on the other hand, consider this same effect as an aggregate from a plurality of sensations, and the ideal trace it leaves as highly compound. 'The idea of an object,' instead of being an elementary starting-point with them, is one of the elaborate results of repetition and experience; and is continually adduced as remarkably illustrating the fusing power of habitual association. Thus James Mill observes:

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"It is to this great law of association that we trace the formation of our ideas of what we call external objects; that is, the ideas of a certain number of sensations, received together so frequently that they coalesce as it were, and are spoken of under the idea of unity. Hence, what we call the idea of a tree, the idea of a stone, the idea of a horse, the idea of a man. In using the names, tree, horse, man, the names of what I call objects, I am referring, and can be referring, only to my own sensations; in fact, therefore, only naming a certain number of sensations regarded as in a particular state of combination, that is, concomitance. Particular sensations of sight, of touch, of the muscles, are the sensations to the ideas of which, color, extension, roughness, hardness, smoothness, taste, smell, so coalescing as to appear one idea, I give the name of the idea of a tree."^[407]

"To precisely the same effect Mr. Bain remarks:

"External objects usually affect us through a plurality of senses. The pebble on the sea-shore is pictured on the eye as form and color. We take it up in the hand and repeat the impression of form, with the additional feeling of touch. Knock two together, and there is a characteristic sound. To preserve the impression of an object of this kind, there must be an association of all these different effects. Such association, when matured and firm, is our idea, our intellectual grasp of the pebble. Passing to the organic world, and plucking a rose, we have the same effects of form to the eye and hand, color and touch, with new effects of odor and taste. A certain time is requisite for the coherence of all these qualities in one aggregate, so as to give us for all purposes the enduring image of the rose. When fully acquired, any one of the characteristic impressions will revive the others; the odor, the sight, the feeling of the thorny stalk—each of these by itself will hoist the entire impression into the view."^[408]

"Now, this order of derivation, making our objective knowledge begin with plurality of impression and arrive at unity, we take to be a complete inversion of our psychological history. Hartley, we think, was perfectly right in taking no notice of the number of inlets through which an object delivers its effect upon us, and, in spite of this circumstance, treating the effect as one.... Even now, after life has read us so many analytic lessons, in proportion as we can fix the attitude of our scene and ourselves, the sense of plurality in our impressions retreats, and we lapse into an undivided consciousness; losing, for instance, the separate notice of any uniform hum in the ear, or light in the eye, or weight of clothes on the body, though not one of them is inoperative on the complexion of our feeling. This law, once granted, must be carried far beyond Hartley's point. Not only must each object present itself to us integrally before it shells off into its qualities, but the whole scene around us must disengage for us object after object from its still background by emergence and change; and even our self-detachment from the world over against us must wait for the start of collision

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between the force we issue and that which we receive. To confine ourselves to the simplest case: when a red ivory ball, seen for the first time, has been withdrawn, it will leave a mental representation of itself, in which all that it simultaneously gave us will indistinguishably coexist. Let a white ball succeed to it; now, and not before, will an attribute detach itself, and the color, by force of contrast, be shaken out into the foreground. Let the white ball be replaced by an egg: and this new difference will bring the form into notice from its previous slumber. And thus, that which began by being simply an object, cut out from the surrounding scene, becomes for us first a *red* object, and then a *red round* object; and so on. Instead, therefore, of the qualities, as separately given, subscribing together and adding themselves up to present us with the object as their aggregate, the object is beforehand with them, and from its integrity delivers them out to our knowledge, one by one. In this disintegration, the primary nucleus never loses its substantive character or name; whilst the difference which it throws off appears as a mere attribute, expressed by an adjective. Hence it is that we are compelled to think of the object as *having*, not as *being*, its qualities; and can never heartily admit the belief of any loose lot of attributes really fusing themselves into a *thing*. The unity of the original whole is not felt to go to pieces and be resolved into the properties which it successively gives off; it retains a residuary existence, which constitutes it a *substance*, as against the emerging quality, which is only its *phenomenal predicate*. Were it not for this perpetual process of differentiation of self from the world, of object from its scene, of attribute from object, no step of Abstraction could be taken; no qualities could fall under our notice; and had we ten thousand senses, they would all converge and meet in but one consciousness. But if this be so, it is an utter falsification of the order of nature to speak of sensations grouping themselves into aggregates, and so composing for us the objects of which we think; and the whole language of the theory, in regard to the field of synchronous existences, is a direct inversion of the truth. Experience proceeds and intellect is trained, not by Association, but by *Dissociation*, not by reduction of pluralities of impression to one, but by the opening out of one into many; and a true psychological history must expound itself in analytic rather than synthetic terms. Precisely those ideas—of Substance, of Mind, of Cause, of Space—which this system treats as infinitely complex, the last result of myriads of confluent elements, are in truth the residuary simplicities of consciousness, whose stability the eddies and currents of phenomenal experience have left undisturbed."^[409]

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The truth is that Experience is trained by *both* association and dissociation, and that psychology must be writ *both* in synthetic and in analytic terms. Our original sensible totals are, on the one hand, subdivided by discriminative attention, and, on the other, united with other totals,—either through the agency of our own movements, carrying our senses from one part of space to another, or because new objects come successively and replace those by which we were at first impressed. The 'simple impression' of Hume, the 'simple idea' of Locke are both abstractions, never realized in experience. Experience, from the very first, presents us with concreted objects, vaguely continuous with the rest of the world which envelops them in space and time, and potentially divisible into inward elements and parts. These objects we break asunder and reunite. We must treat them in both ways for our knowledge of them to grow; and it is hard to say, on the whole, which way preponderates. But since the elements with which the traditional associationism performs its constructions —'simple sensations,' namely—are all products of discrimination carried to a high pitch, it seems as if we ought to discuss the subject of analytic attention and discrimination first.

The noticing of any *part* whatever of our object is an act of discrimination. Already on [p. 404](#) I have described the manner in which we often spontaneously lapse into the undiscriminating state, even with regard to objects which we have already learned to distinguish. Such anæsthetics as chloroform, nitrous oxide, etc., sometimes bring about transient lapses even more total, in which numerical discrimination especially seems gone; for one sees light and hears sound, but whether one or many lights and sounds is quite impossible to tell. Where the parts of an object have already been discerned, and each made the object of a special discriminative act, we can with difficulty feel the object again in its pristine unity; and so prominent may our consciousness of its composition be, that we may hardly believe that it ever could have appeared undivided. But this is an erroneous view, the undeniable fact being that *any number of impressions, from any number of sensory sources, falling simultaneously on a mind WHICH HAS NOT YET EXPERIENCED THEM SEPARATELY, will fuse into a single undivided object for that mind.* The law is that all things fuse that *can* fuse, and nothing separates except what must. What makes impressions separate we have to study in this chapter. Although they separate easier if they come in through distinct nerves, yet distinct nerves are not an unconditional ground of their discrimination, as we shall presently see. The baby, assailed by eyes, ears, nose, skin, and entrails at once, feels it all as one great blooming, buzzing confusion; and to the very end of life, our location of all things in one space is due to the fact that the original extents or bignesses of all the sensations which came to our notice at once, coalesced together into one and the same space. There is no other reason than this why "the hand I touch and see coincides spatially with the hand I immediately feel."^[410]

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It is true that we may sometimes be tempted to exclaim, when once a lot of hitherto unnoticed details of the object lie before us, "How could we ever have been ignorant of these things and yet have felt the object, or drawn the conclusion, as if it were a *continuum*, a *plenum*? There would have been *gaps*—but we felt no gaps; wherefore we must have seen and heard these details, leaned upon these steps; they must have been operative upon our minds, just as they are now, only *unconsciously*, or at least *inattentively*. Our first unanalyzed sensation was really composed of these elementary sensations, our first rapid conclusion was really based on these intermediate inferences, all the while, only we failed to note the fact." But this is nothing but the fatal 'psychologist's fallacy' ([p. 196](#)) of treating an inferior state of mind as if it must somehow know implicitly all that is explicitly known *about the same topic* by superior states of mind. The thing thought of is unquestionably the same, but it is thought twice over in two absolutely different psychoses,—once as an unbroken unit, and again as a sum of discriminated parts. It is not one thought in two editions, but two entirely distinct thoughts of one thing. And each thought is within itself a *continuum*, a *plenum*, needing no contributions from the other to fill up its gaps. As I sit here, I think objects, and I make inferences, which the future is sure to analyze and articulate and riddle with discriminations, showing me many things wherever I now notice one. Nevertheless, my thought feels quite sufficient unto itself for the time being; and ranges from pole to pole, as free, and as unconscious of having overlooked anything, as if it possessed the greatest discriminative enlightenment. We all cease analyzing the world at some point, and notice no more differences. The last units with which we stop are our objective elements of being. Those of a dog are different from those of a Humboldt; those of a practical man from those of a metaphysician. But the dog's and the practical man's thoughts *feel* continuous, though to the Humboldt or the metaphysician they would appear full of gaps and defects. And they *are* continuous, *as thoughts*. It is only *as mirrors of things* that the superior minds find them full of omissions. And when the omitted things are discovered and the unnoticed differences laid bare, it is not that the old *thoughts* split up, but that *new thoughts supersede* them, which make new judgments about the same objective world.

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THE PRINCIPLE OF MEDIATE COMPARISON.

When we discriminate an element, we may contrast it with the case of its own absence, of its simply not being there, without reference to what *is* there; or we may also take the latter into account. Let the first sort of discrimination be called *existential*, the latter *differential* discrimination. A peculiarity of differential discriminations is that they result in a perception of differences which are felt as *greater or less* one than the other. Entire groups of differences may be ranged in series: the musical scale, the color scale, are examples. Every department of our experience may have its data written down in an evenly gradated order, from a lowest to a highest member. And any one datum may be a term in several such orders. A given note may have a high place in the pitch-series, a low place in the loudness-series, and a medium place in the series of agreeablenesses. A given tint must, in order to be fully determined, have its place assigned in the series of qualities, in the series of purities (freedom from white), and in the series of intensities or brightnesses. It may be low in one of these respects, but high in another. In passing from term to term in any such series we are conscious not only of each step of difference being equal to (or greater or less than) the last, but we are conscious of proceeding in a *uniform direction*, different from other possible directions. This *consciousness of serial increase of differences* is one of the fundamental facts of our intellectual life. More, *more*, MORE, of the same kind of difference, we say, as we advance from term to term, and realize that the farther on we get the larger grows the breach between the term we are at and the one from which we started. Between any two terms of such a series the difference is greater than that between any intermediate terms, or than that between an intermediate term and either of the extremes. The louder than the loud is louder than the less loud; the farther than the far is farther than the less far; the earlier than the early is earlier than the late; the higher than the high is higher than the low; the bigger than the big is bigger than the small; or, to put it briefly and universally, *the more than the more is more than the less*; such is *the great synthetic principle of mediate comparison which is involved in the possession by the human mind of the sense of serial increase*. In Chapter XXVIII we shall see the altogether overwhelming importance of this principle in the conduct of all our higher rational operations.

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ARE ALL DIFFERENCES DIFFERENCES OF COMPOSITION?

Each of the differences in one of these uniform series feels like a definite sensible quantity, and each term seems like the last term with this quantity added. In many concrete objects which differ from one another we can plainly see that the difference does consist singly in the fact that one object is the same as the other *plus* something else, or that they both have an identical part, to which each adds a distinct remainder. Thus two pictures may be struck from the same block, but one of them may differ in having color added; or two carpets may show an identical pattern which in each is woven in distinct hues. Similarly, two classes of sensation may have the same emotional tone but negate each other in remaining respects—a dark color and a deep sound, for example; or two faces may have the same shape of nose but everything else unlike. The similarity of the same note sounded by instruments of different timbre is explained by the coexistence of a fundamental tone common to both, with overtones in one which the other lacks. Dipping my hand into water and anon into a colder water, I may then observe certain additional feelings, broader and deeper irradiations of the cold, so to speak, which were not in the earlier experience, though for aught I can tell, the feelings may be otherwise the same. 'Hefting' first one weight, and then another, new feelings may start out in my elbow-joint, wrist, and elsewhere, and make me call the second weight the heavier of the twain. In all these cases each of the differing things may be represented by two parts, one that is common to it and the others, and another that is peculiar to itself. If they form a series, *A, B, C, D*, etc., and the common part be called *X*, whilst the lowest difference be called *d*, then the composition of the series would be as follows:

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$$A = X + d;$$

$$B = (X + d) + d, \text{ or } X + 2d;$$

$$C = X + 3d;$$

$$D = X + 4d;$$

.....

If X itself were ultimately composed of d 's we should have the entire series explained as due to the varying combination and re-combination with itself of an unvarying element; and all the apparent differences of quality would be translated into differences of quantity alone. This is the sort of reduction which the atomic theory in physics and the mind-stuff theory in psychology regard as their ideal. So that, following the analogy of our instances, one might easily be tempted to generalize and to say that all difference is but addition and subtraction, and that what we called 'differential' discrimination is only 'existential' discrimination in disguise; that is to say, that where A and B differ, we merely discern something in the one which the other is without. *Absolute identity in things up to a certain point, then absolute non-identity*, would on this theory take the place of those ultimate qualitative unlikenesses between them, in which we naturally believe; and the mental function of discrimination, ceasing to be regarded as an ultimate one, would resolve itself into mere logical affirmation and negation, or perception that a feature found in one thing, in another does not exist.

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Theoretically, however, this theory is full of difficulty. If all the differences which we feel were *in one direction*, so that all objects could be arranged in one series (however long), it might still work. But when we consider the notorious fact that objects differ from each other in *divergent directions*, it grows well nigh impossible to make it do so. For then, supposing that an object differed from things in one direction by the increment d , it would have to differ from things in another direction by a different sort of increment, call it d' ; so that, after getting rid of qualitative unlikeness between objects, we should have it back on our hands again between their increments. We may of course re-apply our method, and say that the difference between d and d' is not a qualitative unlikeness, but a fact of composition, one of them being the same as the other *plus* an increment of still higher order, δ for example, added. But when we recollect that everything in the world can be compared with everything else, and that the number of directions of difference is indefinitely great, then we see that the complication of self-compoundings of the ultimate differential increment by which, on this theory, all the innumerable unlikenesses of the world are explained, in order to avoid writing any of them down as ultimate differences of kind, would beggar all conception. It is the mind-dust theory; with all its difficulties in a particularly uncompromising form; and all for the sake of the fantastic pleasure of being able arbitrarily to say that there is between the things in the world and between the 'ideas' in the mind nothing but absolute sameness and absolute not-sameness of elements, the not-sameness admitting no degrees.

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To me it seems much wiser to turn away from such transcendental extravagances of speculation, and to abide by the natural appearances. These would leave unlikeness as an indecomposable relation amongst things, and a relation moreover of which there were all degrees. Absolute not-sameness would be the maximal degree, absolute sameness the minimal degree of this unlikeness, the discernment of which would be one of our ultimate cognitive powers.^[411] Certainly the natural appearances are dead against the notion that no qualitative differences exist. With the same clearness with which, in certain objects, we do feel a difference to be a mere matter of *plus* and *minus*, in other objects we feel that this is not the case. Contrast our feeling of the difference between the length of two lines with our feeling of the difference between blue and yellow, or with that between right and left. Is right equal to left with something added? Is blue yellow *plus* something? If so, *plus* what?^[412] So long as we stick to *verifiable* psychology, *we are forced to admit that differences of*

simple KIND *form an irreducible sort of relation* between some of the elements of our experience, and forced to deny that differential discrimination can everywhere be reduced to the mere ascertainment that elements present in one fact, in another fail to exist. The perception that an element exists in one thing and does not exist in another and the perception of qualitative difference are, in short, entirely disconnected mental functions.^[413]

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But at the same time that we insist on this, we must also admit that differences of quality, however abundant, are not the only distinctions with which our mind has to deal. Differences which seem of mere composition, of number, of *plus* and *minus*, also abound.^[414] But it will be best for the present to disregard all these quantitative cases and, taking the others (which, by the least favorable calculation, will still be numerous enough), to consider next *the manner in which we come to cognize simple differences of kind*. We cannot *explain* the cognition; we can only ascertain the conditions by virtue of which it occurs.

THE CONDITIONS OF DISCRIMINATION.

What, then, are the conditions under which we discriminate things differing in a simple way?

First, *the things must be different*, either in time, or place, or quality. If the difference in any of these regards is sufficiently great, then we cannot overlook it, except by not noticing the things at all. No one can help singling out a black stripe on a white ground, or feeling the contrast between a bass note and a high one sounded immediately after it. Discrimination is here *involuntary*. But where the objective difference is less, discrimination need not so inevitably occur, and may even require considerable effort of attention to be performed at all.

Another condition which then favors it is that the sensations excited by *the differing objects should not come to us simultaneously but fall in immediate* SUCCESSION upon the same organ. It is easier to compare successive than simultaneous sounds, easier to compare two weights or two temperatures by testing one after the other with the same hand, than by using both hands and comparing both at once. Similarly it is easier to discriminate shades of light or color by moving the eye from one to the other, so that they successively stimulate the same retinal tract. In testing the local discrimination of the skin, by applying compass-points, it is found that they are felt to touch different spots much more readily when set down one after the other than when both are applied at once. In the latter case they may be two or three inches apart on the back, thighs, etc., and still feel as if they were set down in one spot. Finally, in the case of smell and taste it is well-nigh impossible to compare simultaneous impressions at all. The reason why successive impression so much favors the result seems to be that there is a real *sensation of difference*, aroused by the shock of transition from one perception to another which is unlike the first. This sensation of difference has its own peculiar quality, as difference, which remains sensible, no matter of what sort the terms may be, between which it obtains. It is, in short, one of those transitive feelings, or feelings of relation, of which I treated in a former place (pp. 245 ff.); and, when once aroused, its object lingers in the memory along with the substantive terms which precede and follow, and enables our *judgments of comparison* to be made. We shall soon see reason to believe that no two terms can possibly be *simultaneously* perceived to differ, unless, in a preliminary operation, we have successively attended to each, and, in so doing, had the transitional sensation of difference between them aroused. A field of consciousness, however complex, is never analyzed unless some of its ingredients have changed. We *now* discern, 'tis true, a multitude of coexisting things about us at every moment: but this is because we have had a long education, and each thing we now see distinct has been already differentiated from its neighbors by repeated appearances in successive order. To the infant, sounds, sights, touches, and pains, form probably one unanalyzed bloom of confusion.^[415]

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Where the difference between the successive sensations is but slight, the transition between them must be made as immediate as possible, and both must be compared *in memory*, in order to get the best results. One cannot judge accurately of the difference between two similar wines, whilst the second is still in one's mouth. So of sounds, warmths, etc.—we must get the dying phases of both sensations of the pair we are comparing. Where, however, the difference is strong, this condition is immaterial, and we can then compare a sensation actually felt with another carried in memory only. The longer the interval of time between the sensations, the more uncertain is their discrimination.

The difference, thus immediately felt between two terms, is independent of our ability to identify either of the terms by itself. I can feel two distinct spots to be touched on my skin, yet not know which is above and which below. I can observe two neighboring musical tones to differ, and still not know which of the two is the higher in pitch. Similarly I may discriminate two neighboring tints, whilst remaining uncertain which is the bluer or the yellower, or *how* either differs from its mate.^[416]

With such direct perceptions of difference as this, we must not confound those entirely unlike cases in which we *infer* that two things must differ because we know enough *about* each of them taken by itself to warrant our classing them under distinct heads. It often happens, when the interval is long between two experiences, that our judgments are guided, not so much by a positive image or copy of the earlier one, as by our recollection of certain facts about it. Thus I know that the sunshine to-day is less bright than on a certain day last week, because I then said it was quite dazzling, a remark I should not now care to make. Or I know myself to feel better now than I was last summer, because I can now psychologize, and then I could not. We are constantly busy comparing feelings with whose quality our imagination has no sort of *acquaintance* at the time—pleasures, or pains, for example. It is notoriously hard to conjure up in imagination a lively image of either of these classes of feeling. The associationists may prate of an idea of pleasure being a pleasant idea, of an idea of pain being a painful one, but the unsophisticated sense of mankind is against them, agreeing with Homer that the memory of griefs when past may be a joy, and with Dante that there is no greater sorrow than, in misery, to recollect one's happier time.

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Feelings remembered in this imperfect way *must* be compared with present or recent feelings by the aid of what we know about them. We identify the remote experience in such a case by *conceiving it*. The most perfect way of conceiving it is by defining it in terms of some standard scale. If I know the thermometer to stand at zero to-day and to have stood at 32° last Sunday, I know to-day to be colder, and I know just how much colder, than it was last Sunday. If I know that a certain note was *c*, and that this note is *d*, I know that this note must be the higher of the two.

The inference that two things differ because their concomitants, effects, names, kinds, or—to put it generally—their *signs*, differ, is of course susceptible of unlimited complication. The sciences furnish examples, in the way in which men are led, by noticing differences in effects, to assume new hypothetical causes, differing from any known heretofore. But no matter how many may be the steps by which such inferential discriminations are made, *they all end in a direct intuition of difference somewhere*. The *last* ground for inferring that A and B differ must be that, whilst A is an *m*, B is an *n*, and that *m* and *n* are *seen to differ*. Let us then neglect the complex cases, the A's and the B's, and go back to the study of the unanalyzable perception of difference between their signs, the *m*'s and the *n*'s, when these are seemingly simple terms.

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I said that in their immediate succession the shock of their difference was *felt*. It is felt *repeatedly* when we go back and forth from *m* to *n*; and we make a point of getting it thus

repeatedly (by alternating our attention at least) whenever the shock is so slight as to be with difficulty perceived. But in addition to being felt at the brief instant of transition, the difference also feels as if incorporated and taken up into the second term, which feels 'different-from-the-first' even while it lasts. It is obvious that the 'second term' of the mind in this case is not bald *n*, but a very complex object; and that the sequence is not simply first '*m*,' then '*difference*,' then '*n*'; but first '*m*,' then '*difference*,' then '*n-different-from-m*.' The several thoughts, however, to which these three several objects are revealed, are three ordinary 'segments' of the mental 'stream.'

As our brains and minds are actually made, it is impossible to get certain *m*'s and *n*'s in immediate sequence and to keep them *pure*. If kept pure, it would mean that they remained uncomparated. With us, inevitably, by a mechanism which we as yet fail to understand, the shock of difference is felt between them, and the second object is not *n* pure, but *n-as-different-from-m*.^[417] It is no more a paradox that under these conditions this cognition of *m* and *n* in mutual relation should occur, than that under other conditions the cognition of *m*'s or *n*'s simple quality should occur. But as it has been treated as a paradox, and as a spiritual agent, not itself a portion of the stream, has been invoked to account for it, a word of further remark seems desirable.

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My account, it will be noted, is merely a description of the facts as they occur: feelings (or thoughts) each knowing something, but the later one knowing, if preceded by a certain earlier one, a more complicated object than it would have known had the earlier one not been there. I offer no *explanation* of such a sequence of cognitions. The explanation (I devoutly expect) will be found some day to depend on cerebral conditions. Until it is forthcoming, we can only treat the sequence as a special case of the general law that every experience undergone by the brain leaves in it a modification which is one factor in determining what manner of experiences the following ones shall be (*cf.* [pp. 232-236](#)). To anyone who denies the possibility of such a law I have nothing to say, until he brings his proofs.

The sensationalists and the spiritualists meanwhile (filled both of them with their notion that the mind must in some fashion *contain* what it knows) begin by giving a crooked account of the facts. Both admit that for *m* and *n* to be known in any way whatever, little rounded and finished off duplicates of each must be contained in the mind as separate entities. These pure ideas, so called, of *m* and *n* respectively, succeed each other there. And since they *are distinct*, say the sensationalists, they are *eo ipso* distinguished. "To have ideas different and ideas distinguished, are synonymous expressions; different and distinguished meaning exactly the same thing," says James Mill.^[418] "Distinguished!" say the spiritualists, "distinguished by *what*, forsooth? Truly the respective ideas of *m* and of *n* in the mind are distinct. But for that very reason neither can distinguish itself from the other, for to do that it would have to be aware of the other, and thus for the time being become the other, and that would be to get mixed up with the other and to lose its own distinctness. Distinctness of ideas and idea of distinctness, are not one thing, but two. This last is a *relation*. Only a *relating principle*, opposed in nature to all facts of feeling, an Ego, Soul, or Subject, is competent, by being present to both of the ideas alike, to hold them together and at the same time to keep them distinct."

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But if the plain facts be admitted that the *pure* idea of '*n*' is *never in the mind at all*, when '*m*' has once gone before; and that the feeling '*n-different-from-m*' is itself an absolutely unique pulse of thought, the bottom of this precious quarrel drops out and neither party is left with anything to fight about. Surely such a consummation ought to be welcomed, especially when brought about, us here, by a formulation of the facts which offers itself so naturally and unsophistically.^[419]

We may, then, conclude our examination of the manner in which simple involuntary discrimination comes about, by saying, 1) that its vehicle is a thought possessed of a

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knowledge of both terms compared and of their difference; 2) that the necessary and sufficient condition (as the human mind goes) for arousing this thought is that a thought or feeling of one of the terms discriminated should, as immediately as possible, precede that in which the other term is known; and 3) and that the thought which knows the second term will then also know the difference (or in more difficult cases will be continuously succeeded by one which does know the difference) and both of the terms between which it holds.

This last thought need, however, not *be* these terms with their difference, nor *contain* them. A man's thought can know and mean all sorts of things without those things getting bodily into it—the distant, for example, the future, and the past.^[420] The vanishing term in the case which occupies us vanishes; but because it is the specific term it is and nothing else, it leaves a specific influence behind it when it vanishes, the effect of which is to determine the succeeding pulse of thought in a perfectly characteristic way. Whatever consciousness comes next must know the vanished term and call it different from the one now there.

Here we are at the end of our tether about involuntary discrimination of successively felt simple things; and must drop the subject, hopeless of seeing any deeper into it for the present, and turn to discriminations of a less simple sort.

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THE PROCESS OF ANALYSIS.

And first, of the discrimination of simultaneously felt impressions! Our first way of looking at a reality is often to suppose it simple, but later we may learn to perceive it as compound. This new way of knowing the same reality may conveniently be called by the name of *Analysis*. It is manifestly one of the most incessantly performed of all our mental processes, so let us examine the conditions under which it occurs.

I think we may safely lay down at the outset this fundamental principle, that *any total impression made on the mind must be unanalyzable, whose elements are never experienced apart*. The components of an absolutely changeless group of not-elsewhere-occurring attributes could never be discriminated. If all cold things were wet and all wet things cold, if all hard things pricked our skin, and no other things did so; is it likely that we should discriminate between coldness and wetness, and hardness and pungency respectively? If all liquids were transparent and no non-liquid were transparent, it would be long before we had separate names for liquidity and transparency. If heat were a function of position above the earth's surface, so that the higher a thing was the hotter it became, one word would serve for hot and high. We have, in fact, a number of sensations whose concomitants are almost invariably the same, and we find it, accordingly, almost impossible to analyze them out from the totals in which they are found. The contraction of the diaphragm and the expansion of the lungs, the shortening of certain muscles and the rotation of certain joints, are examples. The converging of the eyeballs and the accommodation for near objects are, for each distance of the object (in the common use of the eyes) inseparably linked, and neither can (without a sort of artificial training which shall presently be mentioned) be felt by itself. We learn that the *causes* of such groups of feelings are multiple, and therefore we frame theories about the composition of the feelings themselves, by 'fusion,' 'integration,' 'synthesis,' or what not. But by direct introspection no analysis of them is ever made. A conspicuous case will come to view when we treat of the emotions. Every emotion has its 'expression,' of quick breathing, palpitating heart, flushed face, or the like. The expression gives rise to bodily feelings; and the emotion is thus necessarily and invariably accompanied by these bodily feelings. The consequence is that it is impossible to apprehend it as a spiritual state by itself, or to analyze it away from the lower feelings in question. It is in fact impossible to prove that it exists as a distinct psychic fact. The present writer strongly doubts that it does so exist. But those who are most firmly persuaded of its existence must wait, to prove their point, until they can quote some as yet unfound pathological case of an individual who shall

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have emotions in a body in which either complete paralysis will have prevented their expression, or complete anæsthesia will have made the latter unfelt.

In general, then, if an object affects us simultaneously in a number of ways, *abcd*, we get a peculiar integral impression, which thereafter characterizes to our mind the individuality of that object, and becomes the sign of its presence; and which is only resolved into *a*, *b*, *c*, *d*, respectively by the aid of farther experiences. These we now may turn to consider.

If any single quality or constituent, a, of such an object, have previously been known by us isolatedly, or have in any other manner already become an object of separate acquaintance on our part, so that we have an image of it, distinct or vague, in our mind, disconnected with bcd, then that constituent a may be analyzed out from the total impression. Analysis of a thing means separate attention to each of its parts. In [Chapter XI](#) we saw that one condition of attending to a thing was the formation from within of a separate image of that thing, which should, as it were, go out to meet the impression received. Attention being the condition of analysis, and separate imagination being the condition of attention, it follows also that separate imagination is the condition of analysis. *Only such elements as we are acquainted with, and can imagine, separately, can be discriminated within a total sense-impression.* The image seems to welcome its own mate from out of the compound, and to heighten the feeling thereof; whereas it dampens and opposes the feeling of the other constituents; and thus the compound becomes broken for our consciousness into parts.

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All the facts cited in Chapter XI, to prove that attention involves inward reproduction, go to prove this point as well. In looking for any object in a room, for a book in a library, for example, we detect it the more readily if, in addition to merely knowing its name, etc., we carry in our mind a distinct image of its appearance. The assafœtida in 'Worcestershire sauce' is not obvious to anyone who has not tasted assafœtida *per se*. In a 'cold' color an artist would never be able to analyze out the pervasive presence of *blue*, unless he had previously made acquaintance with the color blue by itself. All the colors we actually experience are mixtures. Even the purest primaries always come to us with some white. Absolutely pure red or green or violet is never experienced, and so can never be discerned in the so-called primaries with which we have to deal: the latter consequently pass for pure.— The reader will remember how an overtone can only be attended to in the midst of its consorts in the voice of a musical instrument, by sounding it previously alone. The imagination, being then full of it, hears the like of it in the compound tone. Helmholtz, whose account of this observation we formerly quoted, goes on to explain the difficulty of the case in a way which beautifully corroborates the point I now seek to prove. He says:

"The ultimate simple elements of the sensation of tone, simple tones themselves, are rarely heard alone. Even those instruments by which they can be produced (as tuning-forks before resonance-chambers), when strongly excited, give rise to weak harmonic upper partials, partly within and partly without the ear.... Hence the opportunities are very scanty for impressing on our memory an exact and sure image of these simple elementary tones. But if the constituents are only indefinitely and vaguely known, the analysis of their sum into them must be correspondingly uncertain. If we do not know with certainty how much of the musical tone under consideration is to be attributed to its prime, we cannot but be uncertain as to what belongs to the partials. Consequently we must begin by making the individual elements which have to be distinguished individually audible, so as to obtain an entirely fresh recollection of the corresponding sensation, and the whole business requires undisturbed and concentrated attention. We are even without the ease that can be obtained by frequent repetitions of the experiment, such as we possess in the analysis of musical chords into their individual notes. In that case we hear the individual notes sufficiently often by themselves, whereas we rarely hear simple

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tones, and may almost be said never to hear the building up of a compound from its simple tones."^[421]

THE PROCESS OF ABSTRACTION.

Very few elements of reality are experienced by us in absolute isolation. The most that usually happens to a constituent *a*, of a compound phenomenon *abcd*, is that its *strength* relatively to *bcd* varies from a maximum to a minimum; or that it appears linked with *other* qualities, in other compounds, as *ae fg*, or *ah ik*. Either of these vicissitudes in the mode of our experiencing *a* may, under favorable circumstances, lead us to feel the difference between it and its concomitants, and to single it out—not absolutely, it is true, but approximately—and so to analyze the compound of which it is a part. The act of singling out is then called *abstraction*, and the element disengaged is an *abstract*.

Consider the case of fluctuations of relative strength or intensity first. Let there be three grades of the compound, as *Abcd*, *abcd*, and *abcD*. In passing between these compounds, the mind will feel shocks of difference. The differences, moreover, will serially increase, and their direction will be felt as of a distinct sort. The increase from *abcd* to *Abcd* is on the *a* side; that to *abcD* is on the *d* side. And these two differences of direction are differently felt. I do not say that this discernment of the *a*-direction from the *d*-direction will give us an actual intuition either of *a* or of *d* in the abstract. But it leads us to *conceive* or *postulate* each of these qualities, and to define it as the *extreme* of a certain direction. 'Dry' wines and 'sweet' wines, for example, differ, and form a series. It happens that we have an experience of sweetness pure and simple in the taste of sugar, and this we can analyze out of the wine-taste. But no one knows what 'dryness' tastes like, all by itself. It must, however, be something extreme in the dry direction; and we should probably not fail to recognize it as the original of our abstract conception, in case we ever did come across it. In some such way we get to form notions of the flavor of meats, apart from their feeling to the tongue, or of that of fruits apart from their acidity, etc., and we abstract the touch of bodies as distinct from their temperature. We may even apprehend the quality of a muscle's contraction as distinguished from its extent, or one muscle's contraction from another's, as when, by practising with prismatic glasses, and varying our eyes' convergence whilst our accommodation remains the same, we learn the direction in which our feeling of the convergence differs from that of the accommodation.

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But the fluctuation in a quality's intensity is a less efficient aid to our abstracting of it than the diversity of the other qualities in whose company it may appear. *What is associated now with one thing and now with another tends to become dissociated from either, and to grow into an object of abstract contemplation by the mind.* One might call this the *law of dissociation by varying concomitants*. The practical result of it will be to allow the mind which has thus dissociated and abstracted a character to analyze it out of a total, whenever it meets with it again. The law has been frequently recognized by psychologists, though I know of none who has given it the emphatic prominence in our mental history which it deserves. Mr. Spencer says:

"If the property A occurs here along with the properties B, C, D, there along with C, F, H, and again with E, G, B,... it must happen that by multiplication of experiences the impressions produced by these properties on the organism will be disconnected and rendered so far independent in the organism as the properties are in the environment, whence must eventually result a power to recognize attributes in themselves, apart from particular bodies."^[422]

And still more to the point Dr. Martineau, in the passage I have already quoted, writes:

"When a red ivory ball, seen for the first time, has been withdrawn, it will leave a mental representation of itself, in which all that it simultaneously gave us will indistinguishably coexist. Let a white ball succeed to it; now, and not before, will an attribute detach itself, and the *color*, by force of contrast, be shaken out into the foreground. Let the white ball be replaced by an egg, and this new difference will bring the *form* into notice from its previous slumber, and thus that which began by being simply an object cut out from the surrounding scene becomes for us first a *red* object, then a *red round* object, and so on."

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Why the repetition of the character in combination with different wholes will cause it thus to break up its adhesion with any one of them, and roll out, as it were, alone upon the table of consciousness, is a little of a mystery. One might suppose the nerve-processes of the various concomitants to neutralize or inhibit each other more or less and to leave the process of the common term alone distinctly active. Mr. Spencer appears to think that the mere fact that the common term is repeated more often than any one of its associates will, of itself, give it such a degree of intensity that its abstraction must needs ensue.

This has a plausible sound, but breaks down when examined closely. For it is not always the often-repeated character which is first noticed when its concomitants have varied a certain number of times; it is even more likely to be the most novel of all the concomitants, which will arrest the attention. If a boy has seen nothing all his life but sloops and schooners, he will probably never distinctly have singled out in his notion of 'sail' the character of being hung lengthwise. When for the first time he sees a square-rigged ship, the opportunity of extracting the lengthwise mode of hanging as a special accident, and of dissociating it from the general notion of sail, is offered. But there are twenty chances to one that that will not be the form of the boy's consciousness. What he *notices* will be the new and exceptional character of being hung crosswise. He will go home and speak of that, and perhaps never consciously formulate what the more familiar peculiarity consists in.

This mode of abstraction is realized on a very wide scale, because the elements of the world in which we find ourselves appear, as a matter of fact, here, there, and everywhere, and are changing their concomitants all the while. But on the other hand the abstraction is, so to speak, never complete, the analysis of a compound never perfect, because no element is ever given to us absolutely alone, and we can never therefore approach a compound with the image in our mind of any one of its components in a perfectly pure form. Colors, sounds, smells, are just as much entangled with other matter as are more formal elements of experience, such as extension, intensity, effort, pleasure, difference, likeness, harmony, badness, strength, and even consciousness itself. All are embedded in one world. But by the fluctuations and permutations of which we have spoken, we come to form a pretty good notion of the *direction* in which each element differs from the rest, and so we frame the notion of it as a *terminus*, and continue to mean it as an individual thing. In the case of many elements, the simple sensibles, like heat, cold, the colors, smells, etc., the extremes of the directions are almost touched, and in these instances we have a comparatively exact perception of what it is we mean to abstract. But even this is only an approximation; and in literal mathematical strictness *all* our abstracts must be confessed to be but imperfectly imaginable things. At bottom the process is one of *conception*, and is everywhere, even in the sphere of simple sensible qualities, the same as that by which we are usually understood to attain to the notions of abstract goodness, perfect felicity, absolute power, and the like: the direct perception of a difference between compounds, and the imaginary prolongation of the direction of the difference to an ideal terminus, the notion of which we fix and keep as one of our permanent subjects of discourse.

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This is all that I can say usefully about abstraction, or about analysis, to which it leads.

THE IMPROVEMENT OF DISCRIMINATION BY PRACTICE.

In all the cases considered hitherto I have supposed the differences involved to be so large as to be flagrant, and the discrimination, where successive, was treated as involuntary. But, so far from being always involuntary, discriminations are often difficult in the extreme, and by most men never performed. Professor de Morgan, thinking, it is true, rather of conceptual than of perceptive discrimination, wrote, wittily enough: [Pg 509]

"The great bulk of the illogical part of the educated community—whether majority or minority I know not; perhaps six of one and half a dozen of the other—have not power to make a distinction, and of course cannot be made to take a distinction, and of course never attempt to shake a distinction. With them all such things are evasions, subterfuges, come-offs, loop-holes, etc. They would hang a man for horse-stealing under a statute against sheep-stealing; and would laugh at you if you quibbled about the distinction between a horse and a sheep."^[423]

Any personal or practical interest, however, in the results to be obtained by distinguishing, makes one's wits amazingly sharp to detect differences. The culprit himself is not likely to overlook the difference between a horse and a sheep. And long training and practice in distinguishing has the same effect as personal interest. Both of these agencies give to small amounts of objective difference the same effectiveness upon the mind that, under other circumstances, only large ones would have. Let us seek to penetrate the *modus operandi* of their influence—beginning with that of practice and habit.

That 'practice makes perfect' is notorious in the field of motor accomplishments. But motor accomplishments depend in part on sensory discrimination. Billiard-playing, rifle-shooting, tight-rope-dancing, demand the most delicate appreciation of minute disparities of sensation, as well as the power to make accurately graduated muscular response thereto. In the purely sensorial field we have the well-known virtuosity displayed by the professional buyers and testers of various kinds of goods. One man will distinguish by taste between the upper and the lower half of a bottle of old Madeira. Another will recognize, by feeling the flour in a barrel, whether the wheat was grown in Iowa or Tennessee. The blind deaf-mute, Laura Bridgman, had so improved her touch as to recognize, after a year's interval, the hand of a person who once had shaken hers; and her sister in misfortune, Julia Brace, is said to have been employed in the Hartford Asylum to sort the linen of its multitudinous inmates, after it came from the wash, by her wonderfully educated sense of smell. [Pg 510]

The fact is so familiar that few, if any, psychologists have even recognized it as needing explanation. They have seemed to think that practice must, in the nature of things, improve the delicacy of discernment, and have let the matter rest. At most they have said: "Attention accounts for it; we attend more to habitual things, and what we attend to we perceive more minutely." This answer is true, but too general; it seems to me that we can be a little more precise.

There are at least two distinct causes which we can see at work whenever experience improves discrimination:

First, the *terms* whose difference comes to be felt contract disparate associates and these help to drag them apart.

Second, the *difference* reminds us of larger differences of the same sort, and these help us to notice it.

Let us study the first cause first, and begin by supposing two compounds, of ten elements apiece. Suppose no one element of either compound to differ from the corresponding

element of the other compound enough to be distinguished from it if the two are compared alone, and let the amount of this imperceptible difference be called equal to 1. The compounds will differ from each other, however, in ten different ways; and, although each difference by itself might pass unperceived, the total difference, equal to 10, may very well be sufficient to strike the sense. In a word, *increasing the number of 'points' involved in a difference may excite our discrimination as effectually as increasing the amount of difference at any one point.* Two men whose mouth, nose, eyes, cheeks, chin, and hair, all differ slightly, will be as little confounded by us, as two appearances of the same man one with, and the other without, a false nose. The only contrast in the cases is that we can easily name the *point* of difference in the one, whilst in the other we cannot.

Two things, then, B and C, indistinguishable when compared together alone, may each contract adhesions with different associates, and the compounds thus formed may, as wholes, be judged very distinct. *The effect of practice in increasing discrimination must then, in part be due to the reinforcing effect, upon an original slight difference between the terms, of additional differences between the diverse associates which they severally affect.* Let B and C be the terms: If A contract adhesions with B, and C with D, AB may appear very distinct from CD, though B and C *per se* might have been almost identical.

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To illustrate, how does one learn to distinguish claret from burgundy? Probably they have been drunk on different occasions. When we first drank claret we heard it called by that name, we were eating such and such a dinner, etc. Next time we drink it, a dim reminder of all those things chimes through us as we get the taste of the wine. When we try burgundy our first impression is that it is a kind of claret; but something falls short of full identification, and presently we hear it called burgundy. During the next few experiences, the discrimination may still be uncertain—"which," we ask ourselves, "of the two wines is this present specimen?" But at last the claret-flavor recalls pretty distinctly its own name, 'claret,' "that wine I drank at So-and-so's table," etc.; and the burgundy-flavor recalls the name burgundy and some one else's table. *And only when this different SETTING has come to each is our discrimination between the two flavors solid and stable.* After a while the tables and other parts of the setting, besides the name, grow so multifarious as not to come up distinctly into consciousness; but *pari passu* with this, the adhesion of each wine with its own *name* becomes more and more inveterate, and at last each flavor suggests instantly and certainly its own name and nothing else. The names differ far more than the flavors, and help to stretch these latter farther apart. Some such process as this must go on in all our experience. Beef and mutton, strawberries and raspberries, odor of rose and odor of violet, contract different adhesions which reinforce the differences already felt in the terms.

The reader may say that this has nothing to do with making us feel the *difference* between the two terms. It is merely fixing, identifying, and so to speak substantializing, the *terms*. But what we feel as their *difference*, we should feel, even though we were unable to name or otherwise identify the terms.

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To which I reply that I believe that the difference is always concentered and made to seem *more substantial* by recognizing the terms. I went out for instance the other day and found that the snow just fallen had a very odd look, different from the common appearance of snow. I presently called it a 'micaceous' look; and it seemed to me as if, the moment I did so, the difference grew more distinct and fixed than it was before. The other connotations of the word 'micaceous' dragged the snow farther away from ordinary snow and seemed even to aggravate the peculiar look in question. I think some such effect as this on our way of feeling a difference will be very generally admitted to follow from naming the terms between which it obtains; although I admit myself that it is difficult to show coercively that naming or otherwise identifying any given pair of hardly distinguishable terms is essential to their being felt as different at *first*.^[424]

I offer the explanation only as a partial one: it certainly is not complete. Take the way in which *practice refines our local discrimination on the skin*, for example. Two compass-

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points touching the palm of the hand must be kept, say, half an inch asunder in order not to be mistaken for one point. But at the end of an hour or so of practice with them we can distinguish them as two, even when less than a quarter of an inch apart. If the same two regions of the skin were constantly touched, in this experience, the explanation we have been considering would perfectly apply. Suppose a line *abcdef* of points upon the skin. Suppose the local difference of feeling between *a* and *f* to be so strong as to be instantly recognized when the points are simultaneously touched, but suppose that between *c* and *d* to be at first too small for this purpose. If we began by putting the compasses on *a* and *f* and gradually contracted their opening, the strong doubleness recognized at first would still be *suggested*, as the compass-points approached the positions *c* and *d*; for the point *e* would be so near *f*, and so like it, as not to be aroused without *f* also coming to mind. Similarly *d* would recall *e* and, more remotely, *f*. In such wise *c—d* would no longer be bare *c—d*, but something more like *abc—def*,—palpably differing impressions. But in actual experience the education can take place in a much less methodical way, and we learn at last to discriminate *c* and *d* without any constant adhesion being contracted between one of these spots and *ab*, and the other and *ef*. Volkmann's experiments show this. He and Fechner, prompted by Czermak's observation that the skin of the blind was twice as discriminative as that of seeing folks, sought by experiment to show the effects of practice upon themselves. They discovered that even within the limits of a single sitting the distances at which points were felt double might fall at the end to considerably less than half of their magnitude at the beginning; and that some, though not all, of this improved sensibility was retained next day. But they also found that exercising one part of the skin in this way improved the discrimination not only of the corresponding part of the opposite side of the body, but of the neighboring parts as well. Thus, at the beginning of an experimental sitting, the compass-points had to be a Paris line asunder, in order to be distinguished by the little-finger-tip. But after exercising the *other fingers*, it was found that the little-finger-tip could discriminate points only half a line apart.^[425] The same relation existed betwixt divers points of the arm and hand.^[426]

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Here it is clear that the cause which I first suggested fails to apply, and that we must invoke another.

What are the exact experimental phenomena? The spots, as such, are not distinctly located, and the difference, as such, between their feelings, is not distinctly felt, until the interval is greater than the minimum required for the mere perception of their *doubleness*. What we first feel is a bluntness, then a suspicion of doubleness, which presently becomes a distinct doubleness, and at last two different-feeling and differently placed spots with a definite tract of space between them. Some of the places we try give us this latest stage of the perception immediately; some only give us the earliest; and between them are intermediary places. But as soon as the *image of the doubleness* as it is felt in the more discriminative places gets lodged in our memory, it helps us to find its like in places where otherwise we might have missed it, much as the recent hearing of an 'overtone' helps us to detect the latter in a compound sound (*supra*, pp. 439-40). A dim doubleness grows clearer by being assimilated to the image of a distincter doubleness felt a moment before. It is interpreted by means of the latter. And so is any difference, like any other sort of impression, more easily perceived when we carry in our mind to meet it a distinct image of what sort of a thing we are to look for, of what its nature is likely to be.^[427]

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These two processes, the reinforcement of the terms by disparate associates, and the filling of the memory with past differences, of similar direction with the present one, but of more conspicuous amount, *are the only explanations I can offer of the effects of education in this line*. What is accomplished by both processes is essentially the same thing: they make small differences affect us as if they were large ones—that large differences should affect us as they do remains an inexplicable fact. In principle these two processes ought to be sufficient

to account for all possible cases. Whether in fact they are sufficient, whether there be no residual factor which we have failed to detect and analyze out, I will not presume to decide.

PRACTICAL INTERESTS LIMIT DISCRIMINATION.

It will be remembered that on [page 509](#) personal interest was named as a sharpener of discrimination alongside of practice. But personal interest probably acts through attention and not in any immediate or specific way. A distinction in which we have a practical stake is one which we concentrate our minds upon and which we are on the look-out for. We draw it frequently, and we get all the benefits of so doing, benefits which have just been explained. Where, on the other hand, a distinction has no practical interest, where we gain nothing by analyzing a feature from out of the compound total of which it forms a part, we contract a habit of leaving it unnoticed, and at last grow callous to its presence. Helmholtz was the first psychologist who dwelt on these facts as emphatically as they deserve, and I can do no better than quote his very words.

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"We are accustomed," he says, "in a large number of cases where sensations of different kinds, or in different parts of the body, exist simultaneously, to recognize that they are distinct as soon as they are perceived, and to direct our attention at will to any one of them separately. Thus at any moment we can be separately conscious of what we see, of what we hear, of what we feel; and distinguish what we feel in a finger or in the great toe, whether pressure, gentle touch, or warmth. So also in the field of vision. Indeed, as I shall endeavor to show in what follows, we readily distinguish our sensations from one another *when we have a precise knowledge* that they are composite, as, for example, when we have become certain, by frequently repeated and invariable experience, that our present sensation arises from the simultaneous action of many independent stimuli, each of which usually excites an equally well-known individual sensation."

This, it will be observed, is only another statement of our law, that the only individual components which we can pick out of compounds are those of which we have independent knowledge in a separate form.

"This induces us to think that nothing can be easier, when a number of different sensations are simultaneously excited, than to distinguish them individually from each other, and that this is an innate faculty of our minds.

"Thus we find, among other things, that it is quite a matter of course to hear separately the different musical tones which come to our senses collectively; and we expect that in every case when two of them occur together, we shall be able to do the like.

"The matter becomes very different when we set to work to investigate the more unusual cases of perception, and seek more completely to understand the conditions under which the above-mentioned distinction can or cannot be made, as is the case in the physiology of the senses. We then become aware that *two different kinds or grades must be distinguished in our becoming conscious of a sensation*. The lower grade of this consciousness is that in which the influence of the sensation in question makes itself felt only in the conceptions we form of external things and processes, and assists in determining them. This can take place without our needing, or indeed being able, to ascertain to what particular part of our sensations we owe this or that circumstance in our perceptions. In this case we will say that the impression of the sensation in question is *perceived synthetically*. The second higher grade is when we immediately

distinguish the sensation in question as an existing part of the sum of the sensations excited in us. We will say, then, that the sensation is *perceived analytically*. The two cases must be carefully distinguished from each other."
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By the sensation being perceived synthetically, Helmholtz means that it is not discriminated at all, but only felt in a mass with other simultaneous sensations. That it *is* felt there he thinks is proved by the fact that our *judgment* of the total will change if anything occurs to alter the *outer cause* of the sensation.^[429] The following pages from an earlier edition show what the concrete cases of synthetic perception and what those of analytic perception are wont to be:

"In the use of our senses, practice and experience play a much larger part than we ordinarily suppose. Our sensations are in the first instance important only in so far as they enable us to judge rightly of the world about us; and our practice in discriminating between them usually goes only just far enough to meet this end. We are, however, too much disposed to think that we must be immediately conscious of every ingredient of our sensations. This natural prejudice is due to the fact that we are indeed conscious, immediately and without effort, of everything in our sensations which has a bearing upon those practical purposes, for the sake of which we wish to know the outer world. Daily and hourly, during our whole life, we keep our senses in training for this end exclusively, and for its sake our experiences are accumulated. But even within the sphere of these sensations, which do correspond to outer things, training and practice make themselves felt. It is well known how much finer and quicker the painter is in discriminating colors and illuminations than one whose eye is not trained in these matters; how the musician and the musical-instrument maker perceive with ease and certainty differences of pitch and tone which for the ear of the layman do not exist; and how even in the inferior realms of cookery and wine-judging it takes a long habit of comparing to make a master. But more strikingly still is seen the effect of practice when we pass to sensations which depend only on inner conditions of our organs, and which, not corresponding at all to outer things or to their effects upon us, are therefore of no value in giving us information about the outer world. The physiology of the sense-organs has, in recent times, made us acquainted with a number of such phenomena, discovered partly in consequence of theoretic speculations and questionings, partly by individuals, like Goethe and Purkinje, specially endowed by nature with talent for this sort of observation. These so-called subjective phenomena are extraordinarily hard to find; and when they are once found, special aids for the attention are almost always required to observe them. It is usually hard to notice the phenomenon again even when one knows already the description of the first observer. The reason is that we are not only unpractised in singling out these subjective sensations, but that we are, on the contrary, most thoroughly trained in abstracting our attention from them, because they would only hinder us in observing the outer world. Only when their intensity is so strong as actually to hinder us in observing the outer world do we begin to notice them; or they may sometimes, in dreaming and delirium, form the starting point of hallucinations.

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"Let me give a few well-known cases, taken from physiological optics, as examples. Every eye probably contains *muscae volitantes*, so called; these are fibres, granules, etc., floating in the vitreous humor, throwing their shadows on the retina, and appearing in the field of vision as little dark moving spots. They are most easily detected by looking attentively at a broad, bright, blank surface

like the sky. Most persons who have not had their attention expressly called to the existence of these figures are apt to notice them for the first time when some ailment befalls their eyes and attracts their attention to the subjective state of these organs. The usual complaint then is that the *muscæ volitantes* came in with the malady; and this often makes the patients very anxious about these harmless things, and attentive to all their peculiarities. It is then hard work to make them believe that these figures have existed throughout all their previous life, and that all healthy eyes contain them. I knew an old gentleman who once had occasion to cover one of his eyes which had accidentally become diseased, and who was then in no small degree shocked at finding that his other eye was totally blind; with a sort of blindness, moreover, which must have lasted years, and yet he never was aware of it.

"Who, besides, would believe without performing the appropriate experiments, that when one of his eyes is closed there is a great gap, the so-called 'blind spot,' not far from the middle of the field of the open eye, in which he sees nothing at all, but which he fills out with his imagination? Mariotte, who was led by theoretic speculations to discover this phenomenon, awakened no small surprise when he showed it at the court of Charles II. of England. The experiment was at that time repeated with many variations, and became a fashionable amusement. The gap is, in fact, so large that seven full moons alongside of each other would not cover its diameter, and that a man's face 6 or 7 feet off disappears within it. In our ordinary use of vision this great hole in the field fails utterly to be noticed; because our eyes are constantly wandering, and the moment an object interests us we turn them full upon it. So it follows that the object which at any actual moment excites our attention never happens to fall upon this gap, and thus it is that we never grow conscious of the blind spot in the field. In order to notice it, we must first purposely rivet our gaze upon one object and then move about a second object in the neighborhood of the blind spot, striving meanwhile to *attend* to this latter without moving the direction of our gaze from the first object. This runs counter to all our habits, and is therefore a difficult thing to accomplish. With some people it is even an impossibility. But only when it is accomplished do we see the second object vanish and convince ourselves of the existence of this gap.

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"Finally, let me refer to the double images of ordinary binocular vision. Whenever we look at a point with both eyes, all objects on this side of it or beyond it appear double. It takes but a moderate effort of observation to ascertain this fact; and from this we may conclude that we have been seeing the far greater part of the external world double all our lives, although numbers of persons are unaware of it, and are in the highest degree astonished when it is brought to their attention. As a matter of fact, we never *have* seen in this double fashion any particular object upon which our attention was directed at the time; for upon such objects we always converge both eyes. In the habitual use of our eyes, our attention is always withdrawn from such objects as give us double images at the time; this is the reason why we so seldom learn that these images exist. In order to find them we must set our attention a new and unusual task; we must make it explore the lateral parts of the field of vision, not, as usual, to find what objects are there, but to analyze our sensations. Then only do we notice this phenomenon.^[430]

"The same difficulty which is found in the observation of subjective sensations to which no external object corresponds is found also in the analysis of compound sensations which correspond to a single object. Of this sort are many of our sensations of sound. When the sound of a violin, no matter how often we

hear it, excites over and over again in our ear the same sum of partial tones, the result is that our feeling of this sum of tones ends by becoming for our mind a mere sign for the voice of the violin. Another combination of partial tones becomes the sensible sign of the voice of a clarinet, etc. And the oftener any such combination is heard, the more accustomed we grow to perceiving it as an integral total, and the harder it becomes to analyze it by immediate observation. I believe that this is one of the principal reasons why the analysis of the notes of the human voice in singing is relatively so difficult. Such fusions of many sensations into what, to conscious perception, seems a simple whole, abound in all our senses.

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"Physiological optics affords other interesting examples. The perception of the bodily form of a near object comes about through the combination of two diverse pictures which the eyes severally receive from it, and whose diversity is due to the different position of each eye, altering the perspective view of what is before it. Before the invention of the stereoscope this explanation could only be assumed hypothetically; but it can now be proved at any moment by the use of the instrument. Into the stereoscope we insert two flat drawings, representing the two perspective views of the two eyes, in such a manner that each eye sees its own view in the proper place; and we obtain, in consequence, the perception of a single extended solid, as complete and vivid as if we had the real object before us.

"Now we can, it is true, by shutting one eye after the other and attending to the point, recognize the difference in the pictures—at least when it is not too small. But, for the stereoscopic perception of solidity, pictures suffice whose difference is so extraordinarily slight as hardly to be recognized by the most careful comparison; and it is certain that, in our ordinary careless observing of bodily objects, we never dream that the perception is due to two perspective views fused into one, because it is an entirely different kind of perception from that of either flat perspective view by itself. It is certain, therefore, that two different sensations of our two eyes fuse into a third perception entirely different from either. Just as partial tones fuse into the perception of a certain instrument's voice; and just as we learn to separate the partial tones of a vibrating string by pinching a nodal point and letting them sound in isolation; so we learn to separate the images on the two eyes by opening and closing them alternately.

"There are other much more complex instances of the way in which many sensations may combine to serve as the basis of a quite simple perception. When, for example we perceive an object in a certain *direction*, we must somehow be impressed by the fact that certain of our optic nerve-fibres, and no others, are impressed by its light. Furthermore, we must rightly judge the position of our eyes in our head, and of our head upon our body, by means of feelings in our eye-muscles and our neck-muscles respectively. If any of these processes is disturbed we get a false perception of the object's position. The nerve-fibres can be changed by a prism before the eye; or the eyeball's position changed by pressing the organ towards one side; and such experiments show that, for the simple seeing of the position of an object, sensations of these two sorts must concur. But it would be quite impossible to gather this directly from the sensible impression which the object makes. Even when we have made experiments and convinced ourselves in every possible manner that such must be the fact, it still remains hidden from our immediate introspective observation.

"These examples" [of 'synthetic perception,' perception in which each contributory sensation is felt *in* the whole, and is a co-determinant of what the whole shall be, but does not attract the attention to its separate self] "may suffice to show the vital part which the direction of attention and practice in observing play in sense-perception. To apply this now to the ear. The ordinary task which our ear has to solve when many sounds assail it at once is to discern the voices of the several sounding bodies or instruments engaged; beyond this it has no objective interest in analyzing. We wish to know, when many men are speaking together, what each one says, when many instruments and voices combine, which melody is executed by each. Any deeper analysis, such as that of each separate note into its partial tones (although it might be performed by the same means and faculty of hearing as the first analysis) would tell us nothing new about the sources of sound actually present, but might lead us astray as to their number. For this reason we confine our attention in analyzing a mass of sound to the several instruments' voices, and expressly abstain, as it were, from discriminating the elementary components of the latter. In this last sort of discrimination we are as unpractised as we are, on the contrary, well trained in the former kind."^[431]

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After all we have said, no comment seems called for upon these interesting and important facts and reflections of Helmholtz.

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REACTION-TIME AFTER DISCRIMINATION.

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The *time required for discrimination* has been made a subject of experimental measurement. Wundt calls it *Unterscheidungszeit*. His subjects (whose simple reaction-time—see [p. 85](#) ff.—had previously been determined) were required to make a movement, always the same, the instant they discerned *which* of two or more signals they received. The exact time of the signal and that of the movement were automatically registered by a galvanic chronoscope. The particular signal to be received was unknown in advance, and the excess of time occupied by those reactions in which its character had first to be discerned, over the simple reaction-time, measured, according to Wundt, the time required for the act of discrimination. It was found longer when four different signals were irregularly used than when only two were used. In the former case it averaged, for three observers respectively (the signals being the sudden appearance of a black or of a white object),

0.050 sec;
0.047 sec.
0.079 sec.

In the latter case, a red and a green signal being added to the former ones, it became, for the same observers,

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0.157;
0.073;
0.132.^[432]

Later, in Wundt's Laboratory, Herr Tischer made many careful experiments after the same method, where the facts to be discriminated were the different degrees of loudness in the sound which served as a signal. I subjoin Herr Tischer's table of results, explaining that each vertical column after the first gives the average results obtained from a distinct individual, and that the figure in the first column stands for the number of possible loudnesses that might be expected in the particular series of reactions made. The times are expressed in thousandths of a second.

2 6 8.5 10.75 10.7 33 53

3	10	14.4	19.9	22.7	58.5	57.8
4	16.7	20.8	29	29.1	75	84
5	25.6	31	...	40.1	95.5	138 ^[433]

The interesting points here are the great individual variations, and the rapid way in which the time for discrimination increases with the number of possible terms to discriminate. The individual variations are largely due to want of practice in the particular task set, but partly also to discrepancies in the psychic process. One gentleman said, for example, that in the experiments with three sounds, he kept the image of the middle one ready in his mind, and compared what he heard as either louder, lower, or the same. His discrimination among three possibilities became thus very similar to a discrimination between two.^[434]

Mr. J. M. Cattell found he could get no results by this method,^[435] and reverted to one used by observers previous to Wundt and which Wundt had rejected. This is the *einfache Wahlmethode*, as Wundt calls it. The reactor awaits the signal and reacts if it is of one sort, but omits to act if it is of another sort. The reaction thus occurs after discrimination; the motor impulse cannot be sent to the hand until the subject knows what the signal is. The nervous impulse, as Mr. Cattell says, must probably travel to the cortex and excite changes there, causing in consciousness the perception of the signal. These changes occupy the time of discrimination (or perception-time, as it is called by Mr. C.) But *then* a nervous impulse must descend from the cortex to the lower motor centre which stands primed and ready to discharge; and this, as Mr. C. says, gives a will-time as well. The total reaction-time thus includes both 'will-time' and 'discrimination-time.' But as the centrifugal and centripetal processes occupying these two times respectively are probably about the same, and the time used in the cortex is about equally divided between the perception of the signal and the preparation of the motor discharge, if we divide it equally between perception (discrimination) and volition, the error cannot be great.^[436] We can moreover change the nature of the perception without altering the will-time, and thus investigate with considerable thoroughness the length of the perception-time.

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Guided by these principles, Prof. Cattell found the time required for distinguishing a white signal from no signal to be, in two observers:

0.030 sec. and 0.050 sec;

that for distinguishing one color from another was similarly:

0.100 and 0.110;

that for distinguishing a certain color from ten other colors:

0.105 and 0.117;

that for distinguishing the letter A in ordinary print from the letter Z:

0.142 and 0.137;

that for distinguishing a given letter from all the rest of the alphabet (not reacting until that letter appeared)

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0.119 and 0.116;

that for distinguishing a word from any of twenty-five other words, from

0.118 sec. to 0.158 sec.

The difference depending on the length of the words and the familiarity of the language to which they belonged.

Prof. Cattell calls attention to the fact that the time for distinguishing a word is often but little more than that for distinguishing a letter:

"We do not, therefore, distinguish separately the letters of which a word is composed, but the word as a whole. The application of this in teaching children to read is evident."

He also finds a great difference in the time with which various letters are distinguished, E being particularly bad.^[437]

I have, in describing these experiments, followed the example of previous writers and spoken as if the process by which the nature of the signal determines the reaction were identical with the ordinary conscious process of discriminative perception and volition. I am convinced, however, that this is not the case; and that although the results are the same, the form of consciousness is quite different. The reader will remember my contention (*supra*, p. 90 ff.) that the simple reaction-time (usually supposed to include a conscious process of perceiving) really measures nothing but a reflex act. Anyone who will perform reactions with discrimination will easily convince himself that the process here also is far more like a reflex, than like a deliberate, operation. I have made, with myself and students, a large number of measurements where the signal expected was in one series a touch *somewhere* on the skin of the back and head, and in another series a spark *somewhere* in the field of view. The hand had to move as quickly as possible towards the place of the touch or the spark. It did so infallibly, and sensibly instantly; whilst both place and movement seemed to be *perceived* only a moment later, in memory. These experiments were undertaken for the express purpose of ascertaining whether the movement at the sight of the spark was discharged *immediately* by the visual perception, or whether a 'motor-idea' had to intervene between the perception of the spark and the reaction.^[438] The first thing that was manifest to introspection was that no perception or idea of *any* sort preceded the reaction. It jumped of itself, whenever the signal came; and perception was retrospective. We must suppose, then, that the state of eager expectancy of a certain definite range of possible discharges, innervates a whole set of paths in advance, so that when a particular sensation comes it is drafted into its appropriate motor outlet too quickly for the perceptive process to be aroused. In the experiments I describe, the conditions were most favorable for rapidity, for the connection between the signals and their movements might almost be called innate. It is instinctive to move the hand towards a thing seen or a skin-spot touched. But where the movement is *conventionally* attached to the signal, there would be more chance for delay, and the amount of practice would then determine the speed. This is well shown in Tischer's results, quoted on p. 524, where the most practised observer, Tischer himself, reacted in one eighth of the time needed by one of the others.^[439] But what all investigators have aimed to determine in these experiments is the *minimum* time. I trust I have said enough to convince the student that this minimum time by no means measures what we consciously know as discrimination. It only measures something which, under the experimental conditions, leads to a similar result. But it is the bane of psychology to suppose that where results are similar, processes must be the same. Psychologists are too apt to reason as geometers would, if the latter were to say that the diameter of a circle is the same thing as its semi-circumference, because, forsooth, they terminate in the same two points.^[440]

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THE PERCEPTION OF LIKENESS.

The perception of likeness is practically very much bound up with that of difference. That is to say, the only differences we note *as* differences, and estimate quantitatively, and arrange along a scale, are those comparatively limited differences which we find between members of a common genus. The force of gravity and the color of this ink are things it never occurred to me to compare until now that I am casting about for examples of the incomparable. Similarly the elastic quality of this india-rubber band, the comfort of last night's sleep, the good that can be done with a legacy, these are things too discrepant to have

ever been compared ere now. Their relation to each other is less that of difference than of mere logical negativity. To be found *different*, things must as a rule have some commensurability, some aspect in common, which suggests the possibility of their being treated in the same way. This is of course not a theoretic necessity—for any distinction may be called a 'difference,' if one likes—but a practical and linguistic remark.

The *same things, then, which arouse the perception of difference usually arouse that of resemblance also*. And the analysis of them, so as to define wherein the difference and wherein the resemblance respectively consists, is called *comparison*. If we start to deal with the things as simply the same or alike, we are liable to be surprised by the difference. If we start to treat them as merely different, we are apt to discover how much they are alike. *Difference, commonly so called, is thus between species of a genus*. And the faculty by which we perceive the resemblance upon which the genus is based, is just as ultimate and inexplicable a mental endowment as that by which we perceive the differences upon which the species depend. There is a shock of likeness when we pass from one thing to another which in the first instance we merely discriminate numerically, but, at the moment of bringing our attention to bear, perceive to be *similar* to the first; just as there is a shock of difference when we pass between two dissimilars.^[441] The objective extent of the likeness, just like that of the difference, determines the magnitude of the shock. The likeness may be so evanescent, or the basis of it so habitual and little liable to be attended to, that it will escape observation altogether. Where, however, we find it, there we make a genus of the things compared; and their discrepancies and incommensurabilities in other respects can then figure as the *differential* of so many species. As 'thinkables' or 'existents' even the smoke of a cigarette and the worth of a dollar-bill are comparable—still more so as 'perishables,' or as 'enjoyables.'

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Much, then, of what I have said of difference in the course of this chapter will apply, with a simple change of language, to resemblance as well. We go through the world, carrying on the two functions abreast, discovering differences in the like, and likenesses in the different. To abstract the *ground* of either difference or likeness (where it is not ultimate) demands an analysis of the given objects into their parts. So that all that was said of the dependence of analysis upon a preliminary separate acquaintance with the character to be abstracted, and upon its having varied concomitants, finds a place in the psychology of resemblance as well as in that of difference.

But when all is said and done about the conditions which favor our perception of resemblance and our abstraction of its ground, the crude fact remains, that *some people are far more sensitive to resemblances, and far more ready to point out wherein they consist, than others are*. They are the wits, the poets, the inventors, the scientific men, the practical geniuses. *A native talent for perceiving analogies* is reckoned by Prof. Bain, and by others before and after him, as *the leading fact in genius of every order*. But as this chapter is already long, and as the question of genius had better wait till Chapter XXII, where its practical consequences can be discussed at the same time, I will say nothing more at present either about it or about the faculty of noting resemblances. If the reader feels that this faculty is having small justice done it at my hands, and that it ought to be wondered at and made much more of than has been done in these last few pages, he will perhaps find some compensation when that later chapter is reached. I think I emphasize it enough when I call it one of the ultimate foundation-pillars of the intellectual life, the others being Discrimination, Retentiveness, and Association.

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THE MAGNITUDE OF DIFFERENCES.

On [page 489](#) I spoke of differences being greater or less, and of certain groups of them being susceptible of a linear arrangement exhibiting serial *increase*. A series whose terms grow more and more different from the starting point is one whose terms grow less and less

like it. They grow more and more like it if you read them the other way. So that likeness and unlikeness to the starting point are functions inverse to each other, of the position of any term in such a series.

Professor Stumpf introduces the word *distance* to denote the position of a term in any such series. The less like is the term, the more distant it is from the starting point. The ideally regular series of this sort would be one in which the distances—the steps of resemblance or difference—between all pairs of adjacent terms were equal. This would be an evenly gradated series. And it is an interesting fact in psychology that we are able, in many departments of our sensibility, to arrange the terms without difficulty in this evenly gradated way. Differences, in other words, between diverse pairs of terms, *a* and *b*, for example, on the one hand, and *c* and *d* on the other,^[442] can be judged equal or diverse in amount. The distances from one term to another in the series are equal. Linear magnitudes and musical notes are perhaps the impressions which we easiest arrange in this way. Next come shades of light or color, which we have little difficulty in arranging by steps of difference of sensibly equal value. Messrs. Plateau and Delbœuf have found it fairly easy to determine what shade of gray will be judged by every one to hit the exact middle between a darker and a lighter shade.^[443]

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How now do we so readily recognize the equality of two differences between different pairs of terms? or, more briefly, how do we recognize the *magnitude* of a difference at all? Prof. Stumpf discusses this question in an interesting way;^[444] and comes to the conclusion that our feeling for the size of a difference, and our perception that the terms of two diverse pairs are equally or unequally distant from each other, can be explained by no simpler mental process, but, like the shock of difference itself, must be regarded as for the present an unanalyzable endowment of the mind. This acute author rejects in particular the notion which would make our judgment of the distance between two sensations depend upon our *mentally traversing the intermediary steps*. We may of course do so, and may often find it useful to do so, as in musical intervals, or figured lines, But we need not do so; and nothing more is really *required* for a comparative judgment of the amount of a 'distance' than three or four impressions belonging to a common kind.

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The vanishing of all perceptible difference between two numerically distinct things makes them *qualitatively the same* or *equal*. Equality, or *qualitative* (as distinguished from numerical) *identity*, is thus nothing but the *extreme degree of likeness*.^[445]

We saw above (p. 492) that some persons consider that the difference between two objects is constituted of two things, viz., their absolute identity in certain respects, *plus* their absolute non-identity in others. We saw that this theory would not apply to all cases (p. 493). So here any theory which would base likeness on identity, and not rather identity on likeness, must fail. It is supposed perhaps, by most people, that two resembling things owe their resemblance to their absolute identity in respect of some attribute or attributes, combined with the absolute non-identity of the rest of their being. This, which may be true of compound things, breaks down when we come to simple impressions.

"When we compare a deep, a middle, and a high note, e.g. *C, f sharp, a*", we remark immediately that the first is less like the third than the second is. The same would be true of *c d e* in the same region of the scale. Our very calling one of the notes a 'middle' note is the expression of a judgment of this sort. But where here is the identical and where the non-identical part? We cannot think of the overtones; for the first-named three notes have none in common, at least not on musical instruments. Moreover, we might take simple tones, and still our judgment would be unhesitatingly the same, provided the tones were not chosen too close together.... Neither can it be said that the identity consists in their all being sounds, and not a sound, a smell, and a color, respectively. For this

identical attribute comes to each of them in equal measure, whereas the first, being less like the third than the second is, ought, on the terms of the theory we are criticising, to have less of the identical quality.... It thus appears impracticable to define all possible cases of likeness as partial identity *plus* partial disparity; and it is vain to seek in all cases for identical elements."^[446]

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And as all compound resemblances are based on simple ones like these, it follows that likeness *überhaupt* must not be conceived as a special complication of identity, but rather that identity must be conceived as a special degree of likeness, according to the proposition expressed at the outset of the paragraph that precedes. Likeness and difference are ultimate relations perceived. As a matter of fact, no two sensations, no two objects of all those we know, are in scientific rigor identical. We call those of them identical whose difference is unperceived. Over and above this we have a *conception* of absolute sameness, it is true, but this, like so many of our conceptions (cf. [p. 508](#)), is an ideal construction got by following a certain direction of serial increase to its maximum supposable extreme. It plays an important part, among other permanent meanings possessed by us, in our ideal intellectual constructions. But it plays no part whatever in explaining psychologically how we perceive likenesses between simple things.

THE MEASURE OF DISCRIMINATIVE SENSIBILITY.

In 1860, Professor G. T. Fechner of Leipzig, a man of great learning and subtlety of mind, published two volumes entitled 'Psychophysik,' devoted to establishing and explaining a law called by him the psychophysis law, which he considered to express the deepest and most elementary relation between the mental and the physical worlds. It is a formula for the connection between the amount of our sensations and the amount of their outward causes. Its simplest expression is, that when we pass from one sensation to a stronger one of the same kind, the sensations increase proportionally to the logarithms of their exciting causes. Fechner's book was the starting point of a new department of literature, which it would be perhaps impossible to match for the qualities of thoroughness and subtlety, but of which, in the humble opinion of the present writer, the proper psychological outcome is just *nothing*. The psychophysic law controversy has prompted a good many series of observations on sense-discrimination, and has made discussion of them very rigorous. It has also cleared up our ideas about the best methods for getting average results, when particular observations vary; and beyond this it has done nothing; but as it is a chapter in the history of our science, some account of it is here due to the reader.

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Fechner's train of thought has been popularly expounded a great many times. As I have nothing new to add, it is but just that I should quote an existing account. I choose the one given by Wundt in his *Vorlesungen über Menschen und Thierseele*, 1863, omitting a good deal:

"How much stronger or weaker one sensation is than another, we are never able to say. Whether the sun be a hundred or a thousand times brighter than the moon, a cannon a hundred or a thousand times louder than a pistol, is beyond our power to estimate. The natural measure of sensation which we possess enables us to judge of the equality, of the 'more' and of the 'less,' but not of 'how many times more or less.' This natural measure is, therefore, as good as no measure at all, whenever it becomes a question of accurately ascertaining intensities in the sensational sphere. Even though it may teach us in a general way that with the strength of the outward physical stimulus the strength of the concomitant sensation waxes or wanes, still it leaves us without the slightest knowledge of whether the sensation varies in exactly the same proportion as the stimulus itself, or at a slower or a more rapid rate. In a word, we know by our

natural sensibility nothing of the *law* that connects the sensation and its outward cause together. To find this law we must first find an exact measure for the sensation itself; we must be able to say: A stimulus of strength *one* begets a sensation of strength *one*; a stimulus of strength *two* begets a sensation of strength *two*, or *three*, or *four*, etc. But to do this we must first know what a sensation two, three, or four times greater than another signifies....

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"Space magnitudes we soon learn to determine exactly because we only measure one space against another. The measure of mental magnitudes is far more difficult.... But the problem of measuring the magnitude of *sensations* is the first step in the bold enterprise of making mental magnitudes altogether subject to exact measurement.... Were our whole knowledge limited to the fact that the sensation rises when the stimulus rises, and falls when the latter falls, much would not be gained. But even immediate unaided observation teaches us certain facts which, at least in a general way, suggest the law according to which the sensations vary with their outward cause.

"Every one knows that in the stilly night we hear things unnoticed in the noise of day. The gentle ticking of the clock, the air circulating through the chimney, the cracking of the chairs in the room, and a thousand other slight noises, impress themselves upon our ear. It is equally well known that in the confused hubbub of the streets, or the clamor of a railway, we may lose not only what our neighbor says to us, but even not hear the sound of our own voice. The stars which are brightest at night are invisible by day; and although we see the moon then, she is far paler than at night. Everyone who has had to deal with weights knows that if to a pound in the hand a second pound be added, the difference is immediately felt; whilst if it be added to a hundredweight, we are not aware of the difference at all....

"The sound of the clock, the light of the stars, the pressure of the pound, these are all *stimuli* to our senses, and stimuli whose outward amount remains the same. What then do these experiences teach? Evidently nothing but this, that one and the same stimulus, according to the circumstances under which it operates, will be felt either more or less intensely, or not felt at all. Of what sort now is the alteration in the circumstances, upon which this alteration in the feeling may depend? On considering the matter closely we see that it is everywhere of one and the same kind. The tick of the clock is a feeble stimulus for our auditory nerve, which we hear plainly when it is alone, but not when it is added to the strong stimulus of the carriage-wheels and other noises of the day. The light of the stars is a stimulus to the eye. But if the stimulation which this light exerts be added to the strong stimulus of daylight, we feel nothing of it, although we feel it distinctly when it unites itself with the feebler stimulation of the twilight. The pound-weight is a stimulus to our skin, which we feel when it joins itself to a preceding stimulus of equal strength, but which vanishes when it is combined with a stimulus a thousand times greater in amount.

"We may therefore lay it down as a general rule that a stimulus, in order to be felt, may be so much the smaller if the already pre-existing stimulation of the organ is small, but must be so much the larger, the greater the pre-existing stimulation is. From this in a general way we can perceive the connection between the stimulus and the feeling it excites. At least thus much appears, that the law of dependence is not as simple a one as might have been expected beforehand. The simplest relation would obviously be that the sensation should increase in identically the same ratio as the stimulus, thus that if a stimulus of strength *one* occasioned a sensation *one*, a stimulus of *two* should occasion sensation *two*, stimulus *three*, sensation *three*, etc. But if this simplest of all

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relations prevailed, a stimulus added to a pre-existing strong stimulus ought to provoke as great an increase of feeling as if it were added to a pre-existing weak stimulus; the light of the stars e.g., ought to make as great an addition to the daylight as it does to the darkness of the nocturnal sky. This we know not to be the case: the stars are invisible by day, the addition they make to our sensation then is unnoticeable, whereas the same addition to our feeling of the twilight is very considerable indeed. So it is clear that the strength of the sensations does not increase in proportion to the amount of the stimuli, but more slowly. And now comes the question, in what proportion does the increase of the sensation grow less as the increase of the stimulus grows greater. To answer this question, every-day experiences do not suffice. We need exact measurements both of the amounts of the various stimuli, and of the intensity of the sensations themselves.

"How to execute these measurements, however, is something which daily experience suggests. To measure the strength of sensations is, as we saw, impossible; we can only measure the difference of sensations. Experience showed us what very unequal differences of sensation might come from equal differences of outward stimulus. But all these experiences expressed themselves in one kind of fact, that the same difference of stimulus could in one case be felt, and in another case not felt at all—a pound felt if added to another pound, but not if added to a hundred-weight.... We can quickest reach a result with our observations if we start with an arbitrary strength of stimulus, notice what sensation it gives us, and then *see how much we can increase the stimulus without making the sensation seem to change*. If we carry out such observations with stimuli of varying absolute amounts, we shall be forced to choose in an equally varying way the amounts of addition to the stimulus which are capable of giving us a just barely perceptible feeling of *more*. A light, to be just perceptible in the twilight need not be near as bright as the starlight; it must be far brighter to be just perceived during the day. If now we institute such observations for all possible strengths of the various stimuli, and note for each strength the amount of addition of the latter required to produce a barely perceptible alteration of sensation, we shall have a series of figures in which is immediately expressed the law according to which the sensation alters when the stimulation is increased...."

Observations according to this method are particularly easy to make in the spheres of light-, [Pg 537] sound-, and pressure-sensation.... Beginning with the latter case,

"We find a surprisingly simple result. The barely sensible addition to the original weight *must stand exactly in the same proportion to it*, be the *same fraction* of it, no matter what the absolute value may be of the weights on which the experiment is made.... As the average of a number of experiments, this fraction is found to be about $1/3$; that is, no matter what pressure there may already be made upon the skin, an increase or a diminution of the pressure will be *felt*, as soon as the added or subtracted weight amounts to one third of the weight originally there."

Wundt then describes how differences may be observed in the muscular feelings, in the feelings of heat, in those of light, and in those of sound; and he concludes his seventh lecture (from which our extracts have been made) thus:

"So we have found that all the senses whose stimuli we are enabled to measure accurately, obey a uniform law. However various may be their several delicacies of discrimination, *this* holds true of all, that *the increase of the*

stimulus necessary to produce an increase of the sensation bears a constant ratio to the total stimulus. The figures which express this ratio in the several senses may be shown thus in tabular form:

Sensation of light,	1/100
Muscular sensation,	1/17
Feeling of pressure,	1/3
Feeling of warmth,	1/3
Feeling of sound,	1/3

"These figures are far from giving as accurate a measure as might be desired. But at least they are fit to convey a general notion of the relative discriminative susceptibility of the different senses.... The important law which gives in so simple a form the relation of the sensation to the stimulus that calls it forth was first discovered by the physiologist Ernst Heinrich Weber to obtain in special cases. Gustav Theodor Fechner first proved it to be a law for all departments of sensation. Psychology owes to him the first comprehensive investigation of sensations from a physical point of view, the first basis of an exact Theory of Sensibility."

So much for a general account of what Fechner calls Weber's law. The 'exactness' of the theory of sensibility to which it leads consists in the supposed fact that it gives the means of representing sensations by numbers. The *unit* of any kind of sensation will be that increment which, when the stimulus is increased, we can just barely perceive to be added. The total number of units which any given sensation contains will consist of the total number of such increments which may be perceived in passing from no sensation of the kind to a sensation of the present amount. We cannot get at this number directly, but we can, now that we know Weber's law, get at it by means of the physical stimulus of which it is a function. For if we know how much of the stimulus it will take to give a barely perceptible sensation, and then what percentage of addition to the stimulus will constantly give a barely perceptible increment to the sensation, it is at bottom only a question of compound interest to compute, out of the total amount of stimulus which we may be employing at any moment, the number of such increments, or, in other words, of sensational units to which it may give rise. This number bears the same relation to the total stimulus which the time elapsed bears to the capital plus the compound interest accrued.

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To take an example: If stimulus A just falls short of producing a sensation, and if r be the percentage of itself which must be added to it to get a sensation which is barely perceptible — call this sensation 1 — then we should have the series of sensation-numbers corresponding to their several stimuli as follows:

Sensation 0 = stimulus A;
 Sensation 1 = stimulus A $(1 + r)$;
 Sensation 2 = stimulus A $(1 + r)^2$;
 Sensation 3 = stimulus A $(1 + r)^3$;

 Sensation n = stimulus A $(1 + r)^n$.

The sensations here form an arithmetical series, and the stimuli a geometrical series, and the two series correspond term for term. Now, of two series corresponding in this way, the terms of the arithmetical one are called the logarithms of the terms corresponding in rank to them in the geometrical series. A conventional arithmetical series beginning with zero has been formed in the ordinary logarithmic tables, so that we may truly say (assuming our facts to be correct so far) that the *sensations vary in the same proportion as the logarithms of their respective stimuli*. And we can thereupon proceed to compute the number of units in any given sensation (considering the unit of sensation to be equal to the just perceptible

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increment above zero, and the unit of stimulus to be equal to the increment of stimulus r , which brings this about) by multiplying the logarithm of the stimulus by a constant factor which must vary with the particular kind of sensation in question. If we call the stimulus R , and the constant factor C , we get the formula

$$S = C \log R,$$

which is what Fechner calls the *psychophysischer Maasformel*. This, in brief, is Fechner's reasoning, as I understand it.

The *Maasformel* admits of mathematical development in various directions, and has given rise to arduous discussions into which I am glad to be exempted from entering here, since their interest is mathematical and metaphysical and not primarily psychological at all.^[447] I must say a word about them metaphysically a few pages later on. Meanwhile it should be understood that no human being, in any investigation into which sensations entered, has ever used the numbers computed in this or any other way in order to test a theory or to reach a new result. The whole notion of measuring sensations numerically, remains in short a mere mathematical speculation about possibilities, which has never been applied to practice. Incidentally to the discussion of it, however, a great many particular facts have been discovered about discrimination which merit a place in this chapter.

In the first place it is found, when the difference of two sensations approaches the limit of discernibility, that at one moment we discern it and at the next we do not. There are accidental fluctuations in our inner sensibility which make it impossible to tell just what the least discernible increment of the sensation is without taking the average of a large number of appreciations. These *accidental errors* are as likely to increase as to diminish our sensibility, and are eliminated in such an average, for those above and those below the line then neutralize each other in the sum, and the normal sensibility, if there be one (that is, the sensibility due to constant causes as distinguished from these accidental ones), stands revealed. The best way of getting at the average sensibility has been very minutely worked over. Fechner discussed three methods, as follows:

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(1) *The Method of just-discernible Differences*. Take a standard sensation S , and add to it until you distinctly feel the addition d ; then subtract from $S + d$ until you distinctly feel the effect of the subtraction;^[448] call the difference here d' . The least discernible difference sought is $d + d'/2$; and the ratio of this quantity to the original S (or rather to $S + d - d'$) is what Fechner calls the difference-threshold. *This difference-threshold should be a constant fraction* (no matter what is the size of S) *if Weber's law holds universally true*. The difficulty in applying this method is that we are *so often in doubt* whether anything has been added to S or not. Furthermore, if we simply take the smallest d about which we are *never* in doubt or in error, we certainly get our least discernible difference larger than it ought theoretically to be.^[449]

Of course the *sensibility* is small when the least discernible difference is large, and *vice versa*; in other words, it and the difference-threshold are inversely related to each other.

(2) *The Method of True and False Cases*. A sensation which is barely greater than another will, on account of accidental errors in a long series of experiments, sometimes be judged equal, and sometimes smaller; i.e., we shall make a certain number of false and a certain number of true judgments about the difference between the two sensations which we are comparing.

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"But the larger this difference is, the more the number of the true judgments will increase at the expense of the false ones; or, otherwise expressed, the nearer to unity will be the fraction whose denominator represents the whole number of judgments, and whose numerator represents those which are true. If m is a ratio of this nature, obtained by comparison of two stimuli, A and B , we

may seek another couple of stimuli, a and b , which when compared will give the same ratio of true to false cases."^[450]

If this were done, and the ratio of a to b then proved to be equal to that of A to B , that would prove that pairs of small stimuli and pairs of large stimuli may affect our discriminative sensibility similarly so long as the ratio of the components to each other within each pair is the same. In other words, it would in so far forth prove the Weberian law. Fechner made use of this method to ascertain his own power of discriminating differences of weight, recording no less than 24,576 separate judgments, and computing as a result that his discrimination for the same relative increase of weight was less good in the neighborhood of 500 than of 300 grams, but that after 500 grams it improved up to 3000, which was the highest weight he experimented with.

(3) *The Method of Average Errors* consists in taking a standard stimulus and then trying to make another one of the same sort exactly equal to it. There will in general be an error whose amount is large when the discriminative sensibility called in play is small, and *vice versa*. The sum of the errors, no matter whether they be positive or negative, divided by their number, gives the average error. This, when certain corrections are made, is assumed by Fechner to be the 'reciprocal' of the discriminative sensibility in question. It should bear a constant proportion to the stimulus, no matter what the absolute size of the latter may be, if Weber's law hold true.

These methods deal with just perceptible differences. Delbœuf and Wundt have experimented with larger differences by means of what Wundt calls the *Méthode der mittleren Abstufungen*, and what we may call

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(4) *The Method of Equal-appearing Intervals*. This consists in so arranging three stimuli in a series that the intervals between the first and the second shall appear equal to that between the second and the third. At first sight there seems to be no direct logical connection between this method and the preceding ones. By them we compare equally *perceptible* increments of stimulus in different regions of the latter's scale; but by the fourth method we compare increments which strike us as equally *big*. But what we can but just notice as an increment need not appear always of the same bigness after it is noticed. On the contrary, it will appear much bigger when we are dealing with stimuli that are already large.

(5) The method of doubling the *stimulus* has been employed by Wundt's collaborator, Merkel, who tried to make one stimulus seem just double the other, and then measured the objective relation of the two. The remarks just made apply also to this case.

So much for the methods. The results differ in the hands of different observers. I will add a few of them, and will take first the *discriminative sensibility to light*.

By the first method, Volkmann, Aubert, Masson, Helmholtz, and Kräpelin find figures varying from $1/3$ or $1/4$ to $1/195$ of the original stimulus. The smaller fractional increments are discriminated when the light is already fairly strong, the larger ones when it is weak or intense. That is, the discriminative sensibility is low when weak or overstrong lights are compared, and at its best with a certain medium illumination. It is thus a function of the light's intensity; but throughout a certain range of the latter it keeps constant, and *in so far forth* Weber's law is verified for light. Absolute figures cannot be given, but Merkel, by method 1, found that Weber's law held good for stimuli (measured by his arbitrary unit) between 96 and 4096, beyond which intensity no experiments were made.^[451] König and

Brodhun have given measurements by method 1 which cover the most extensive series, and moreover apply to six different colors of light. These experiments (performed in Helmholtz's laboratory, apparently,) ran from an intensity called 1 to one which was 100,000 times as great. From intensity 2000 to 20,000 Weber's law held good; below and above this range discriminative sensibility declined. The increment discriminated here was the same for all colors of light, and lay (according to the tables) between 1 and 2 per cent of the stimulus.^[452] Delbœuf had verified Weber's law for a certain range of luminous intensities by method 4; that is, he had found that the objective intensity of a light which appeared midway between two others was really the geometrical mean of the latter's intensities. But A. Lehmann and afterwards Neiglick, in Wundt's laboratory, found that effects of contrast played so large a part in experiments performed in this way that Delbœuf's results could not be held conclusive. Merkel, repeating the experiments still later, found that the objective intensity of the light which we judge to stand midway between two others neither stands midway nor is a geometric mean. The discrepancy from both figures is enormous, but is least large from the midway figure or arithmetical mean of the two extreme intensities.^[453] Finally, the stars have from time immemorial been arranged in 'magnitudes' supposed to differ by equal-seeming intervals. Lately their intensities have been gauged photometrically, and the comparison of the subjective with the objective series has been made. Prof. J. Jastrow is the latest worker in this field. He finds, taking Pickering's Harvard photometric tables as a basis, that the ratio of the average intensity of each 'magnitude' to that below it decreases as we pass from lower to higher magnitudes, showing a uniform departure from Weber's law, if the method of equal-appearing intervals be held to have any direct relevance to the latter.^[454]

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Sounds are less delicately discriminated in intensity than lights. A certain difficulty has come from disputes as to the measurement of the objective intensity of the stimulus. Earlier inquiries made the perceptible increase of the stimulus to be about 1/3 of the latter. Merkel's latest results of the method of just perceptible differences make it about 3/10 for that part of the scale of intensities during which Weber's law holds good, which is from 20 to 5000 of M.'s arbitrary unit.^[455] Below this the fractional increment must be larger. Above it no measurements were made.

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For *pressure and muscular sense* we have rather divergent results. Weber found by the method of just-perceptible differences that persons could distinguish an increase of weight of 1/40 when the two weights were successively lifted by the same hand. It took a much larger fraction to be discerned when the weights were laid on a hand which rested on the table. He seems to have verified his results for only two pairs of differing weights,^[456] and on this founded his 'law.' Experiments in Hering's laboratory on lifting 11 weights, running from 250 to 2750 grams showed that the least perceptible increment varied from 1/21 for 250 grams to 1/114 for 2500. For 2750 it rose to 1/98 again. Merkel's recent and very careful experiments, in which the finger pressed down the beam of a balance counterweighted by from 25 to 8020 grams, showed that between 200 and 2000 grams a constant fractional increase of about 1/13 was felt when there was no movement of the finger, and of about 1/19 when there was movement. Above and below these limits the discriminative power grew less. It was greater when the pressure was upon one square millimeter of surface than when it was upon seven.^[457]

Warmth and taste have been made the subject of similar investigations with the result of verifying something like Weber's law. The determination of the unit of stimulus is, however, so hard here that I will give no figures. The results may be found in Wundt's *Physiologische Psychologie*, 3d Ed. i, 370-2.

The discrimination of lengths by the eye has been found also to obey to a certain extent Weber's law. The figures will all be found in G. E. Müller, *op. cit.* part ii, chap. x, to which the reader is referred. Professor Jastrow has published some experiments, made by what

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may be called a modification of the method of equal-appearing differences, on our estimation of the length of sticks, by which it would seem that the estimated intervals and the real ones are directly and not logarithmically proportionate to each other. This resembles Merkel's results by that method for weights, lights, and sounds, and differs from Jastrow's own finding about star-magnitudes.^[458]

If we look back over these facts as a whole, we see that it is not any fixed amount added to an impression that makes us notice an increase in the latter, but that the amount depends on how large the impression already is. The amount is expressible as a certain fraction of the entire impression to which it is added; and it is found that the fraction is a well-nigh constant figure throughout an entire region of the scale of intensities of the impression in question. Above and below this region the fraction increases in value. This is *Weber's law*, which in so far forth expresses an empirical generalization of practical importance, without involving any theory whatever or seeking any absolute measure of the sensations themselves. It is in the

Theoretic Interpretation of Weber's Law

that Fechner's originality exclusively consists, in his assumptions, namely, 1) that the just-perceptible increment is the *sensation-unit*, and is in all parts of the scale the same (mathematically expressed, $\Delta s = \text{const.}$); 2) that all our sensations consist of sums of these units; and finally, 3) that the reason why it takes a constant fractional increase of the stimulus to awaken this unit lies in an ultimate law of the connection of mind with matter, whereby the quantities of our feelings are related logarithmically to the quantities of their objects. Fechner seems to find something inscrutably sublime in the existence of an ultimate 'psychophysics' law of this form.

These assumptions are all peculiarly fragile. To begin with, the *mental fact* which in the experiments corresponds to the increase of the stimulus is not an *enlarged sensation*, but a *judgment that the sensation is enlarged*. What Fechner calls the 'sensation' is what appears to the mind as the *objective phenomenon* of light, warmth, weight, sound, impressed part of body, etc. Fechner tacitly if not openly assumes that such a *judgment of increase* consists in the simple fact that an *increased number* of sensation-units are present to the mind; and that the judgment is thus itself a quantitatively bigger mental thing when it judges large differences, or differences between large terms, than when it judges small ones. But these ideas are really absurd. The hardest sort of judgment, the judgment which strains the attention most (if *that* be any criterion of the judgment's 'size'), is that about the *smallest* things and differences. But really it has no meaning to talk about one judgment being bigger than another. And even if we leave out judgments and talk of sensations only, we have already found ourselves (in [Chapter VI](#)) quite unable to read any clear meaning into the notion that they are masses of units combined. To introspection, our feeling of pink is surely not a portion of our feeling of scarlet; nor does the light of an electric arc seem to contain that of a tallow-candle in itself. Compound *things* contain parts; and one such thing may have twice or three times as many parts as another. But when we take a simple sensible quality like light or sound, and say that there is now twice or thrice as much of it present as there was a moment ago, although we seem to mean the same thing as if we were talking of compound objects, we really mean something different. We mean that if we were to arrange the various possible degrees of the quality in a scale of serial increase, the *distance*, *interval*, or *difference* between the stronger and the weaker specimen before us would seem about as great as that between the weaker one and the beginning of the scale. *It is these RELATIONS, these DISTANCES, which we are measuring and not the composition of the qualities*

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themselves, as Fechner thinks. Whilst if we turn to objects which *are* divisible, surely a big object may be known in a little thought. Introspection shows moreover that in most sensations a new *kind* of feeling invariably accompanies our judgment of an increased impression; and this is a fact which Fechner's formula disregards.^[459]

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But apart from these *a priori* difficulties, and even supposing that sensations did consist of added units, Fechner's assumption that all *equally perceptible* additions are *equally great* additions is entirely arbitrary. Why might not a small addition to a small sensation be as *perceptible* as a large addition to a large one? In this case Weber's law would apply not to the additions themselves, but only to their perceptibility. Our *noticing* of a difference of units in two sensations would depend on the latter being in a fixed ratio. But the *difference itself* would depend directly on that between their respective stimuli. So many units added to the stimulus, so many added to the sensation, and if the stimulus grew in a certain ratio, in exactly the same ratio would the sensation also grow, though its *perceptibility* grew according to the logarithmic law.^[460]

If *A* stand for the smallest difference which *we perceive*, then we should have, instead of the formula $\Delta s = \text{const.}$, which is Fechner's, the formula $\Delta s/s = \text{const.}$, a formula which interprets all the *facts* of Weber's law, in an entirely different theoretic way from that adopted by Fechner.^[461]

The entire superstructure which Fechner rears upon the facts is thus not only seen to be arbitrary and subjective, but in the highest degree improbable as well. The departures from Weber's law in regions where it does not obtain, he explains by the compounding with it of other unknown laws which mask its effects. As if *any* law could not be found in *any* set of phenomena, provided one have the wit to invent enough other coexisting laws to overlap and neutralize it! The whole outcome of the discussion, so far as Fechner's theories are concerned, is indeed *nil*. *Weber's law alone remains true, as an empirical generalization of fair extent*: What we add to a large stimulus we notice less than what we add to a small one, unless it happen *relatively to the stimulus* to be as great.

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Weber's law is probably purely physiological.

One can express this state of things otherwise by saying that the whole of the stimulus does not seem to be effective in giving us the perception of 'more,' and the simplest interpretation of such a state of things would be *physical*. The loss of effect would take place in the nervous system. If our feelings resulted from a condition of the nerve-molecules which it grew ever more difficult for the stimulus to increase, our feelings would naturally grow at a slower rate than the stimulus itself. An ever larger part of the latter's work would go to overcoming the resistances, and an ever smaller part to the realization of the feeling-bringing state. Weber's law would thus be a sort of *law of friction* in the neural machine.^[462] Just how these inner resistances and frictions are to be conceived is a speculative question. Delbœuf has formulated them as fatigue; Bernstein and Ward, as irradiations. The latest, and probably the most 'real,' hypothesis is that of Ebbinghaus, who supposes that the intensity of sensation depends on the *number* of neural molecules which are disintegrated in the unit of time. There are only a certain number at any time which are *capable* of disintegrating; and whilst most of these are in an average condition of instability, some are almost stable and some already near to decomposition. The smallest stimuli affect these latter molecules only; and as they are but few, the sensational effect from adding a given quantity of stimulus *at first* is relatively small. Medium stimuli affect the majority of the molecules, but affect fewer and fewer in proportion as they have already diminished their number. The latest additions to the stimuli find all the medium molecules already disintegrated, and only affect the small relatively indecomposable remainder, thus giving rise to increments of feeling which are correspondingly small. (Pflüger's Archiv, 45, 113.)

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It is surely in some such way as this that Weber's law is to be interpreted, if it ever is. The Fechnerian *Maasformel* and the conception of it as an ultimate 'psychophysics law' will remain an 'idol of the den,' if ever there was one. Fechner himself indeed was a German *Gelehrter* of the ideal type, at once simple and shrewd, a mystic and an experimentalist, homely and daring, and as loyal to facts as to his theories. But it would be terrible if even such a dear old man as this could saddle our Science forever with his patient whimsies, and, in a world so full of more nutritious objects of attention, compel all future students to plough through the difficulties, not only of his own works, but of the still drier ones written in his refutation. Those who desire this dreadful literature can find it; it has a 'disciplinary value;' but I will not even enumerate it in a foot-note. The only amusing part of it is that Fechner's critics should always feel bound, after smiting his theories hip and thigh and leaving not a stick of them standing, to wind up by saying that nevertheless to him belongs the *imperishable glory*, of first formulating them and thereby turning psychology into an *exact science*,

"And everybody praised the duke
Who this great fight did win.'
'But what good came of it at last?'
Quoth little Peterkin.
'Why, that I cannot tell,' said he,
'But 'twas a famous victory!'"

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- [406] Human Understanding, ii, xi, 1, 2.
- [407] Analysis, vol. i, p. 71.
- [408] The Senses and the Intellect, page 411.
- [409] Essays Philosophical and Theological: First Series, pp. 268-273.
- [410] Montgomery in 'Mind,' x, 527. Cf. also Lipps: Grundtatsachen des Seelenlebens, p. 579 ff.; and see below, Chapter XIX.
- [411] Stumpf (Tonpsychologie, i, 116 ff.) tries to prove that the theory that all differences are differences of composition leads necessarily to an infinite regression when we try to determine the unit. It seems to me that in his particular reasoning he forgets the ultimate units of the mind-stuff theory. I cannot find the completed infinite to be one of the obstacles to belief in this theory, although I fully accept Stumpf's general reasoning, and am only too happy to find myself on the same side with such an exceptionally clear thinker. The strictures by Wahle in the Vierteljsch. f. wiss. Phil. seem to me to have no force, since the writer does not discriminate between resemblance of things obviously compound and that of things sensibly simple.
- [412] The *belief that the causes* of effects felt by us to differ qualitatively are facts which differ only in quantity (e.g. that blue is caused by so many ether-waves, and yellow by a smaller number) must not be confounded with the feeling that the effects differ quantitatively themselves.
- [413] Herr G. H. Schneider, in his youthful pamphlet (Die Unterscheidung, 1877) has tried to show that there are no positively existent elements of sensibility, no substantive qualities between which differences obtain, but that the terms we call such, the sensations, are but sums of differences, loci or starting points whence many directions of difference proceed. '*Unterschiedsempfindungs-Complexe*' are what he calls them. This absurd carrying out of that 'principle of relativity' which we shall have to mention in Chapter XVII may serve as a counterpoise to the mind-stuff theory, which says that there are nothing but substantive sensations, and denies the existence of relations of difference between them at all.

- [414] Cf. Stumpf, *Tonpsychologie*, i, 121, and James Ward, *Mind*, i, 464.
- [415] The ordinary treatment of this is to call it the result of the *fusion* of a lot of sensations, in themselves separate. This is pure mythology, as the sequel will abundantly show.
- [416] "We often begin to be dimly aware of a difference in a sensation or group of sensations, before we can assign any definite character to that which differs. Thus we detect a strange or foreign ingredient or flavor in a familiar dish, or of tone in a familiar tune, and yet are wholly unable for a while to say what the intruder is like. Hence perhaps discrimination may be regarded as the earliest and most primordial mode of intellectual activity." (Sully: *Outlines of Psychology*, p. 142. Cf. also G. H. Schneider: *Die Unterscheidung*, pp. 9-10.)
- [417] In cases where the difference is slight, we may need, as previously remarked, to get the dying phase of *n* as well as of *m* before *n-different-from-m* is distinctly felt. In that case the inevitably successive feelings (as far as we can sever what is so continuous) would be four, *m*, *difference*, *n*, *n-different-from-m*. This slight additional complication alters not a whit the essential features of the case.
- [418] Analysis. J. S. Mill's ed., ii, 17. Cf. also pp. 12, 14.
- [419] There is only one obstacle, and that is our inveterate tendency to believe that where two things or qualities are compared, it *must* be that exact duplicates of both have got into the mind and have matched themselves against each other there. To which the first reply is the empirical one of "Look into the mind and see." When I recognize a weight which I now lift as *inferior* to the one I just lifted; when, with my tooth now aching, I perceive the pain to be *less* intense than it was a minute ago; the two things in the mind which are compared would, by the authors I criticise, be admitted to be an actual sensation and an image in the memory. An image in the memory, by general consent of these same authors, is admitted to be a weaker thing than a sensation. Nevertheless it is in these instances judged stronger; that is, an object supposed to be known only in so far forth as this image represents it, is judged stronger. Ought not this to shake one's belief in the notion of separate representative 'ideas' weighing themselves, or being weighed by the Ego, against each other in the mind? And let it not be said that what makes us judge the felt pain to be weaker than the imagined one of a moment since is our recollection of the *downward nature of the shock of difference* which we felt as we passed to the present moment from the one before it. That shock does undoubtedly have a different character according as it comes between terms of which the second diminishes or increases; and it may be admitted that in cases Where the past term is doubtfully remembered, the memory of the shock as *plus* or *minus*, might sometimes enable us to establish a relation which otherwise we should not perceive. But one could hardly expect the memory of this shock to overpower our actual comparison of terms, both of which are *present* (as are the image and the sensation in the case supposed), and make us judge the weaker one to be the stronger.—And hereupon comes the second reply: Suppose the mind does compare two realities by comparing two ideas of its own which represent them—what is gained? The same mystery is still there. The ideas must still be *known*; and, as the attention in comparing oscillates from one to the other, past must be known with present just as before. If you must end by simply saying that your 'Ego,' whilst *being* neither the idea of *m* nor the idea of *n*, yet knows and compares both, why not allow your pulse of thought, which *is* neither the thing *m* nor the thing *n*, to know and compare both directly? 'Tis but a question of how to *name* the facts least artificially. The egoist *explains* them, by naming them as an Ego 'combining' or 'synthetizing' two ideas, no more than we do by naming them a pulse of thought knowing two facts.
- [420] I fear that few will be converted by my words, so obstinately do thinkers of all schools refuse to admit the unmediated function of *knowing a thing*, and so incorrigibly do they substitute *being the thing* for it. E.g., in the latest utterance of

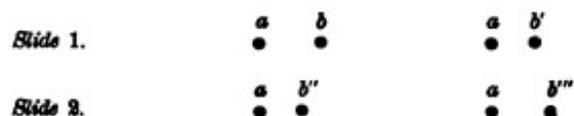
the spiritualistic philosophy (Bowne's Introduction to Psychological Theory, 1887, published only three days before this writing) one of the first sentences which catch my eye is this: "What remembers? The spiritualist says, the soul remembers; it abides across the years and the flow of the body, and *gathering up its past, carries it with it*" (p. 28). Why, for heaven's sake, O Bowne, cannot you say '*knows it*'? If there is anything our soul does *not* do to its past, it is to carry it with it.

[421] Sensations of Tone, 2d English Ed., p. 65.

[422] Psychology, i, 345.

[423] A Budget of Paradoxes, p. 380.

[424] The explanation I offer presupposes that a difference too faint to have any direct effect in the way of making the mind notice it *per se* will nevertheless be strong enough to keep its 'terms' from calling up identical associates. It seems probable from many observations that this is the case. All the facts of 'unconscious' inference are proofs of it. We say a painting 'looks' like the work of a certain artist, though we cannot name the characteristic differentia. We see by a man's face that he is sincere, though we can give no definite reason for our faith. The facts of sense-perception quoted from Helmholtz a few pages below will be additional examples. Here is another good one, though it will perhaps be easier understood after reading the chapter on Space-perception than now. Take two stereoscopic slides and represent on each half-slide a pair of spots, *a* and *b*, but make their distances such that the *a*'s are equidistant on both slides, whilst the *b*'s are nearer together on slide 1 than on slide 2. Make moreover the distance $ab = ab'''$ and the distance $ab' = ab''$. Then look successively at the two slides stereoscopically, so that the *a*'s in both are directly fixated (that is fall on the two foveæ, or centres of distinctest vision). The *a*'s will then appear single, and so probably will the *b*'s. But the now single-seeming *b* on slide 1 will look nearer, whilst that on slide 2 will look farther than the *a*. But, if the diagrams are rightly drawn, *b* and *b'''* must affect 'identical' spots, spots equally far to the right of the fovea, *b* in the left eye and *b'''* in the right eye. The same is true of *b'* and *b''*. Identical spots are spots whose sensations cannot possibly be discriminated as such. Since in these two observations, however, they give rise to such opposite perceptions of distance, and prompt such opposite tendencies to movement (since in slide 1 we *converge* in looking from *a* to *b*, whilst in slide 2 we *diverge*), it follows that two processes which occasion feelings quite indistinguishable to direct consciousness may nevertheless be each allied with disparate associates both of a sensorial and of a motor kind. Cf. Donders, Archiv f. Ophthalmologie, Bd. 13 (1867). The basis of his essay is that we cannot *feel* on which eye any particular element of a compound picture falls, but its effects on our total perception differ in the two eyes.



[425] A. W. Volkmann: Ueber den Einfluss der Uebung, etc., Leipzig Berichte, Math.-phys. Classe. x, 1858, p. 67.

[426] *Ibid.* Tabelle 1, p. 43.

[427] Professor Lipps accounts for the tactile discrimination of the blind in a way which (divested of its 'mythological' assumptions) seems to me essentially to agree with this. Stronger ideas are supposed to raise weaker ones over the threshold of consciousness by fusing with them, the tendency to fuse being proportional to the similarity of the ideas Cf. Grundtatsachen, etc., pp. 232-3; also pp. 118, 492, 526-7.

- [428] Sensations of Tone, 2d. English Edition, p. 62.
- [429] Compare as to this, however, what I said above, Chapter V, [pp. 172-176](#).
- [430] When a person squints, double images are formed in the centre of the field. As a matter of fact, most squinters are found blind of one eye, or almost so; and it has long been supposed amongst ophthalmologists that the blindness is a secondary affection superinduced by the voluntary suppression of one of the sets of double images, in other words by the positive and persistent refusal to use one of the eyes. This explanation of the blindness has, however, been called in question of late years. See, for a brief account of the matter, O. F. Wadsworth in Boston Med. and Surg. Journ., cxvi, 49 (Jan. 20, '87), and the replies by Derby and others a little later.—W. J.
- [431] Tonempfindungen, Dritte Auflage, pp. 102-107.—The reader who has assimilated the contents of our [Chapter V](#), above, will doubtless have remarked that the illustrious physiologist has fallen, in these paragraphs, into that sort of interpretation of the facts which we there tried to prove erroneous. Helmholtz, however, is no more careless than most psychologists in confounding together the object perceived, the organic conditions of the perception, and the sensations which *would* be excited by the several parts of the object, or by the several organic conditions, *provided* they came into action separately or were separately attended to, and in assuming that what is true of any one of these sorts of fact must be true of the other sorts also. If each organic condition or part of the object is there, its sensation, he thinks, must be there also, only in a 'synthetic'—which is indistinguishable from what the authors whom we formerly reviewed called an 'unconscious'—state. I will not repeat arguments sufficiently detailed in the earlier chapter (see especially [pp. 170-176](#)), but simply say that what he calls the 'fusion of many *sensations* into one' is really the production of one sensation by the co-operation of many *organic conditions*; and that what perception fails to discriminate (when it is 'synthetic') is not *sensations* already existent but not singled out, but new objective *facts*, judged truer than the facts already synthetically perceived—two views of the solid body, many harmonic tones, instead of one view and one tone, states of the eyeball-muscles thitherto unknown, and the like. These new facts, when first discovered, are known in states of consciousness never till that moment exactly realized before, states of consciousness which at the same time judge them to be determinations of the same *matter of fact* which was previously realized. All that Helmholtz says of the conditions which hinder and further analysis applies just as naturally to the analysis, through the advent of *new* feelings, of *objects* into their elements, as to the analysis of aggregate feelings into elementary feelings supposed to have been hidden in them all the while.

The reader can himself apply this criticism to the following passages from Lotze and Stumpf respectively, which I quote because they are the ablest expressions of the view opposed to my own. Both authors, it seems to me, commit the psychologist's fallacy, and allow their later knowledge of the things felt to be foisted into their account of the primitive way of feeling them.

Lotze says: "It is indubitable that the simultaneous assault of a variety of different stimuli on different senses, or even on the same sense, puts us into a state of confused general feeling in which we are certainly not conscious of clearly distinguishing the different impressions. Still it does not follow that in such a case we have a positive perception of an actual unity of the contents of our ideas, arising from their mixture; our state of mind seems rather to consist in (1) the consciousness of our inability to separate what really has remained diverse, and (2) in the general feeling of the disturbance produced in the economy of our body by the simultaneous assault of the stimuli.... Not that the sensations melt into one another, but simply that the act of distinguishing them is absent; and this again certainly not so far that the fact of the difference remains entirely unperceived, but

only so far as to prevent us from determining the amount of the difference, and from apprehending other relations between the different impressions. Anyone who is annoyed at one and the same time by glowing heat, dazzling light, deafening noise, and an offensive smell, will certainly not fuse these disparate sensations into a single one with a single content which could be sensuously perceived; they remain for him in separation, and he merely finds it impossible to be conscious of one of them apart from the others. But, further, he will have a feeling of discomfort—what I mentioned above as the *second* constituent of his whole state. For every stimulus which produces in consciousness a definite content of sensation is also a definite degree of disturbance, and therefore makes a call upon the forces of the nerves; and the sum of these little changes, which in their character as disturbances are not so diverse as the contents of consciousness they give rise to, produce the general feeling which, added to the inability to distinguish, deludes us into the belief in an actual absence of diversity in our sensations. It is only in some such way as this, again, that I can imagine that state which is sometimes described as the beginning of our whole education, a state which in itself is supposed to be simple, and to be afterwards divided into different sensations by an activity of separation. No activity of separation in the world could establish differences where no real diversity existed; for it would have nothing to guide it to the places where it was to establish them, or to indicate the width it was to give them." (Metaphysic, § 260, English translation.)

Stumpf writes as follows: "Of coexistent sensations there are always a large number undiscriminated in consciousness, or (if one prefer to call what is undiscriminated unconscious) in the soul. They are, however, not fused into a simple quality. When, on entering a room, we receive sensations of odor and warmth together, without expressly attending to either, the two qualities of sensation are not, as it were, an entirely new simple quality, which first at the moment in which attention analytically steps in *changes into* smell and warmth.... In such cases we find ourselves in presence of an indefinable, unnamable total of feeling. And when, after successfully analyzing this total, we call it back to memory, as it was in its unanalyzed state, and compare it with the elements we have found, the latter (as it seems to me) may be recognized as real parts contained in the former, and the former seen to be their sum. So, for example, when we clearly perceive that the content of our sensation of oil of peppermint is partly a sensation of taste and partly one of temperature." (Tonpsychologie, i, 107.)

I should prefer to say that we perceive that objective fact, known to us as the peppermint taste, to contain those other objective facts known as aromatic or sapid quality, and coldness, respectively. No ground to suppose that the vehicle of this last very complex perception has any identity with the earlier psychosis—least of all is contained in it.

[432] *Physiol. Psych.*, ii, 248.

[433] *Wundt's Philos. Studien*, i, 527.

[434] *Ibid.* p. 530.

[435] *Mind*, xi, 377 ff. He says: "I apparently either distinguished the impression and made the motion simultaneously, or if I tried to avoid this by waiting until I had formed a distinct impression before I began to make the motion, I added to the simple reaction, not only a perception, but a volition."—Which remark may well confirm our doubts as to the strict *psychologic* worth of any of these measurements.

[436] *Mind*, xi, 379.

[437] For other determinations of discrimination-time by this method cf. v. Kries and Auerbach, *Archiv f. Physiologie*, Bd. i, p. 297 ff. (these authors get much smaller

figures); Friedrich, *Psychologische Studien*, i, 39. Chapter ix of Buccola's book, *Le Legge del tempo*, etc., gives a full account of the subject.

- [438] If so, the reactions upon the spark would have to be slower than those upon the touch. The investigation was abandoned because it was found impossible to narrow down the difference between the conditions of the sight-series and those of the touch-series, to nothing more than the possible presence in the latter of the intervening motor-idea. Other disparities could not be excluded.
- [439] Tischer gives figures from quite unpractised individuals, which I have not quoted. The discrimination-time of one of them is 22 times longer than Tischer's own! (*Psychol. Studien*, i, 527.)
- [440] Compare Lipps's excellent passage to the same critical effect in his *Grundtatsachen des Seelenlebens*, pp. 390-393.—I leave my text just as it was written before the publication of Lange's and Münsterberg's results cited on [pp. 92](#) and [432](#). Their 'shortened' or 'muscular' times, got when the expectant attention was addressed to the possible reactions rather than to the stimulus, constitute the minimal reaction-time of which I speak, and all that I say in the text falls beautifully into line with their results.
- [441] Cf. Sully: *Mind*, x, 494-5; Bradley: *ibid.* xi, 83; Bosanquet: *ibid.* xi, 405.
- [442] The judgment becomes easier if the two couples of terms have one member in common, if $a-b$ and $b-c$, for example, are compared. This, as Stumpf says (*Tonpsychologie*, i, 131), is probably because the introduction of the fourth term brings involuntary cross-comparisons with it, a and b with d , b with c , etc., which confuses us by withdrawing our attention from the relations we ought alone to be estimating.
- [443] J. Delbœuf: *Éléments de Psychophysique* (Paris, 1883), p. 64. Plateau in Stumpf, *Tonpsych.*, i, 125. I have noticed a curious enlargement of certain 'distances' of difference under the influence of chloroform. The jingling of the bells on the horses of a horse-car passing the door, for example, and the rumbling of the vehicle itself, which to our ordinary hearing merge together very readily into a *quasi*-continuous body of sound, have seemed so far apart as to require a sort of mental facing in opposite directions to get from one to the other, as if they belonged in different worlds. I am inclined to suspect, from certain data, that the ultimate philosophy of difference and likeness will have to be built upon experiences of intoxication, especially by nitrous oxide gas, which lets us into intuitions the subtlety whereof is denied to the waking state. Cf. B. P. Blood: *The Anæsthetic Revelation, and the Gist of Philosophy* (Amsterdam, N. Y., 1874). Cf. also *Mind*, vii, 200.
- [444] *Op. cit.* p. 126 ff.
- [445] Stumpf, pp. 111-121.
- [446] Stumpf, pp. 116-7. I have omitted, so as not to make my text too intricate, an extremely acute and conclusive paragraph, which I reproduce here: "We may generalize: Wherever a number of sensible impressions are apprehended *as a series*, there in the last instance must perceptions of simple likeness be found. *Proof*: Assume that all the terms of a series, e.g. the qualities of tone, $c d e f g$, have something in common,—*no matter what it is*, call it X ; then I say that the differing parts of each of these terms must not only be differently constituted in each, but must *themselves form a series*, whose existence is the ground for our apprehending the original terms in serial form. We thus get instead of the original series $a b c d e f \dots$ the equivalent series $X\alpha, X\beta, X\gamma, \dots$ etc. What is gained? The question immediately arises: How is $\alpha \beta \gamma$ known as a series? According to the theory, these elements must themselves be made up of a part common to all, and of parts differing in each, which latter parts form a new series, and so on *ad infinitum*, which is absurd."

- [447] The most important ameliorations of Fechner's formula are Delbœuf's in his *Recherches sur la Mesure des Sensations* (1873), p. 35, and Elsas's in his pamphlet *Über die Psychophysik* (1886) p. 16.
- [448] Reversing the order is for the sake of letting the opposite accidental errors due to 'contrast' neutralize each other.
- [449] Theoretically it would seem that it ought to be equal to the sum of all the additions which we judge to be increases divided by the total number of judgments made.
- [450] J. Delbœuf, *Éléments de Psychophysique* (1883), p. 9.
- [451] *Philos. Studien*, iv, 588.
- [452] *Berlin Acad. Sitzungsberichte*, 1888, p. 917. Other observers (Dobrowolsky, Lamausky) found great differences in different colors.
- [453] See Merkel's tables, *loc. cit.* p. 568.
- [454] *American Journal of Psychology*, i, 125. The rate of decrease is small but steady, and I cannot well understand what Professor J. means by saying that his figures verify Weber's law.
- [455] *Philosophische Studien*, v, 514-5.
- [456] Cf. G. E. Müller: *Zur Grundlegung der Psychophysik*, §§ 68-70.
- [457] *Philosophische Studien*, v, 287 ff.
- [458] *American J. of Psychology*, iii, 44-7.
- [459] Cf. Stumpf, *Tonpsychologie*, pp. 397-9. "One sensation cannot be a multiple of another. If it could, we ought to be able to subtract the one from the other, and to feel the remainder by itself. Every sensation presents itself as an indivisible unit." Professor von Kries, in the *Vierteljahrsschrift für wiss. Philosophie*, vi, 257 ff., shows very clearly the absurdity of supposing that our stronger sensations contain our weaker ones as parts. They differ as qualitative units. Compare also J. Tannery in Delbœuf's *Éléments de Psychophysique* (1883), p. 134 ff.; J. Ward in *Mind*, i, 464; Lotze, *Metaphysik*, § 258.
- [460] F Brentano, *Psychologie*, i, 9, 88 ff.—Merkel thinks that his results with the method of equal-appearing intervals show that we compare considerable intervals with each other by a different law from that by which we notice barely perceptible intervals. The stimuli form an arithmetical series (a pretty wild one according to his figures) in the former case, a geometrical one in the latter—at least so I understand this valiant experimenter but somewhat obscure if acute writer.
- [461] This is the formula which Merkel thinks he has verified (if I understand him aright) by his experiments by method 4.
- [462] Elsas: *Ueber die Psychophysik* (1856), p. 41. When the pans of a balance are already loaded, but in equilibrium, it takes a proportionally larger weight added to one of them to incline the beam.

CHAPTER XIV.^[463]

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ASSOCIATION.

After discrimination, association! Already in the last chapter I have had to invoke, in order to explain the improvement of certain discriminations by practice, the 'association' of the objects to be distinguished, with other more widely differing ones. It is obvious that the

advance of our knowledge *must* consist of both operations; for objects at first appearing as wholes are analyzed into parts, and objects appearing separately are brought together and appear as new compound wholes to the mind. Analysis and synthesis are thus the incessantly alternating mental activities, a stroke of the one preparing the way for a stroke of the other, much as, in walking, a man's two legs are alternately brought into use, both being indispensable for any orderly advance.

The manner in which trains of imagery and consideration follow each other through our thinking, the restless flight of one idea before the next, the transitions our minds make between things wide as the poles asunder, transitions which at first sight startle us by their abruptness, but which, when scrutinized closely, often reveal intermediating links of perfect naturalness and propriety—all this magical, imponderable streaming has from time immemorial excited the admiration of all whose attention happened to be caught by its omnipresent mystery. And it has furthermore challenged the race of philosophers to banish something of the mystery by formulating the process in simpler terms. The problem which the philosophers have set themselves is that of ascertaining *principles of connection* between the thoughts which thus appear to sprout one out of the other, whereby their peculiar succession or coexistence may be explained. [Pg 551]

But immediately an ambiguity arises: which sort of connection is meant? connection *thought-of*, or connection *between thoughts*? These are two entirely different things, and only in the case of one of them is there any hope of finding 'principles.' The jungle of connections *thought of* can never be formulated simply. Every conceivable connection may be thought of—of coexistence, succession, resemblance, contrast, contradiction, cause and effect, means and end, genus and species, part and whole, substance and property, early and late, large and small, landlord and tenant, master and servant,—Heaven knows what, for the list is literally inexhaustible. The only simplification which could possibly be aimed at would be the reduction of the relations to a smaller number of types, like those which such authors as Kant and Renouvier call the 'categories' of the understanding.^[464] According as we followed one category or another we should sweep, with our thought, through the world in this way or in that. And all the categories would be logical, would be relations of reason. They would fuse the items into a continuum. Were *this* the sort of connection sought between one moment of our thinking and another, our chapter might end here. For the only summary description of these infinite possibilities of transition, is that they are all *acts of reason*, and that the mind proceeds from one object to another by some rational path of connection. The trueness of this formula is only equalled by its sterility, for psychological purposes. Practically it amounts to simply referring the inquirer to the relations between facts or things, and to telling him that his thinking follows them.

But as a matter of fact, his thinking only sometimes follows them, and these so-called 'transitions of reason' are far from being all alike reasonable. If pure thought runs all our trains, why should she run some so fast and some so slow, some through dull flats and some through gorgeous scenery, some to mountain-heights and jewelled mines, others through dismal swamps and darkness?—and run some off the track altogether, and into the wilderness of lunacy? Why do we spend years straining after a certain scientific or practical problem, but all in vain—thought refusing to evoke the solution we desire? And why, some day, walking in the street with our attention miles away from that quest, does the answer saunter into our minds as carelessly as if it had never been called for—suggested, possibly, by the flowers on the bonnet of the lady in front of us, or possibly by nothing that we can discover? If reason can give us relief then, why did she not do so earlier? [Pg 552]

The truth must be admitted that thought works under conditions imposed *ab extra*. The great law of habit itself—that twenty experiences make us recall a thing better than one, that long indulgence in error makes right thinking almost impossible—seems to have no essential foundation in reason. The business of thought is with truth—the number of experiences ought to have nothing to do with her hold of it; and she ought by right to be able to hug it all

the closer, after years wasted out of its presence. The contrary arrangements seem quite fantastic and arbitrary, but nevertheless are part of the very bone and marrow of our minds. Reason is only one out of a thousand possibilities in the thinking of each of us. Who can count all the silly fancies, the grotesque suppositions, the utterly irrelevant reflections he makes in the course of a day? Who can swear that his prejudices and irrational beliefs constitute a less bulky part of his mental furniture than his clarified opinions? It is true that a presiding arbiter seems to sit aloft in the mind, and emphasize the better suggestions into permanence, while it ends by dropping out and leaving unrecorded the confusion. But this is all the difference. The *mode of genesis* of the worthy and the worthless seems the same. The laws of our actual thinking, of the *cogitatum*, must account alike for the bad and the good materials on which the arbiter has to decide, for wisdom and for folly. The laws of the arbiter, of the *cogitandum*, of what we *ought* to think, are to the former as the laws of ethics are to those of history. Who but an Hegelian historian ever pretended that reason in action was *per se* a sufficient explanation of the political changes in Europe?

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There are, then, mechanical conditions on which thought depends, and which, to say the least, determine the order in which is presented the content or material for her comparisons, selections, and decisions. It is a suggestive fact that Locke, and many more recent Continental psychologists, have found themselves obliged to invoke a mechanical process to account for the *aberrations* of thought, the obstructive precessions, the frustrations of reason. This they found in the law of habit, or what we now call Association by Contiguity. But it never occurred to these writers that a process which could go the length of actually producing some ideas and sequences in the mind might safely be trusted to produce others too; and that those habitual associations which further thought may also come from the same mechanical source as those which hinder it. Hartley accordingly suggested habit as a sufficient explanation of all connections of our thoughts, and in so doing planted himself squarely upon the properly psychological aspect of the problem of connection, and sought to treat both rational and irrational connections from a single point of view. The problem which he essayed, however lamely, to answer, was that of the connection between our psychic states considered purely as such, regardless of the objective connections of which they might take cognizance. How does a man come, after thinking of A, to think of B the next moment? or how does he come to think A and B always together? These were the phenomena which Hartley undertook to explain by cerebral physiology. I believe that he was, in many essential respects, on the right track, and I propose simply to revise his conclusions by the aid of distinctions which he did not make.

But the whole historic doctrine of psychological association is tainted with one huge error—that of the construction of our thoughts out of the confounding of themselves together of immutable and incessantly recurring 'simple ideas.' It is the cohesion of these which the 'principles of association' are considered to account for. In [Chapters VI](#) and [IX](#) we saw abundant reasons for treating the doctrine of simple ideas or psychic atoms as mythological; and, in all that follows, our problem will be to keep whatever truths the associationist doctrine has caught sight of without weighing it down with the untenable incumbrance that the association is between 'ideas.'

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Association, so far as the word stands for an effect, is between THINGS THOUGHT OF—it is THINGS, not ideas, which are associated in the mind. We ought to talk of the association of *objects*, not of the association of *ideas*. And so far as association stands for a *cause*, it is between *processes in the brain*—it is these which, by being associated in certain ways,

determine what successive objects shall be thought. Let us proceed towards our final generalizations by surveying first a few familiar facts.

The laws of motor habit in the lower centres of the nervous system are disputed by no one. A series of movements repeated in a certain order tend to unroll themselves with peculiar ease in that order for ever afterward. Number one awakens number two, and that awakens number three, and so on, till the last is produced. A habit of this kind once become inveterate may go on automatically. And so it is with the objects with which our thinking is concerned. With some persons each note of a melody, heard but once, will accurately revive in its proper sequence. Small boys at school learn the inflections of many a Greek noun, adjective, or verb, from the reiterated recitations of the upper classes falling on their ear as they sit at their desks. All this happens with no voluntary effort on their part and with no thought of the spelling of the words. The doggerel rhymes which children use in their games, such as the formula

"Ana mana mona mike
Barcelona bona strike,"

used for 'counting out,' form another familiar example of things heard in sequence cohering in the same order in the memory.

In touch we have a smaller number of instances, though probably every one who bathes himself in a certain fixed manner is familiar with the fact that each part of his body over which the water is squeezed from the sponge awakens a premonitory tingling consciousness in that portion of skin which is habitually the next to be deluged. Tastes and smells form no very habitual series in our experience. But even if they did, it is doubtful whether habit would fix the order of their reproduction quite so well as it does that of other sensations. In vision, however, we have a sense in which the order of reproduced things is very nearly as much influenced by habit as is the order of remembered sounds. Rooms, landscapes, buildings, pictures, or persons with whose look we are very familiar, surge up before the mind's eye with all the details of their appearance complete, so soon as we think of any one of their component parts. Some persons, in reciting printed matter by heart, will seem to see each successive word, before they utter it, appear in its order on an imaginary page. A certain chess-player, one of those heroes who train themselves to play several games at once blindfold, is reported to say that in bed at night after a match the games are played all over again before his mental eye, each board being pictured as passing in turn through each of its successive stages. In this case, of course, the intense previous voluntary strain of the power of visual representation is what facilitated the fixed order of revival.

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Association occurs as amply between impressions of different senses as between homogeneous sensations. Seen things and heard things cohere with each other, and with odors and tastes, in representation, in the same order in which they cohered as impressions of the outer world. Feelings of contact reproduce similarly the sights, sounds, and tastes with which experience has associated them. In fact, the 'objects' of our perception, as trees, men, houses, microscopes, of which the real world seems composed, are nothing but clusters of qualities which through simultaneous stimulation have so coalesced that the moment one is excited actually it serves as a sign or cue for the idea of the others to arise. Let a person enter his room in the dark and grope among the objects there. The touch of the matches will instantaneously recall their appearance. If his hand comes in contact with an orange on the table, the golden yellow of the fruit, its savor and perfume will forthwith shoot through his mind. In passing the hand over the sideboard or in jogging the coal-scuttle with the foot, the large glossy dark shape of the one and the irregular blackness of the other awaken like a flash and constitute what we call the recognition of the objects. The voice of the violin faintly echoes through the mind as the hand is laid upon it in the dark, and the

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feeling of the garments or draperies which may hang about the room is not *understood* till the look correlative to the feeling has in each case been resuscitated. Smells notoriously have the power of recalling the other experiences in whose company they were wont to be felt, perhaps long years ago; and the voluminous emotional character assumed by the images which suddenly pour into the mind at such a time forms one of the staple topics of popular psychological wonder—

"Lost and gone and lost and gone!
A breath, a whisper—some divine farewell—
Desolate sweetness—far and far away."

We cannot hear the din of a railroad tram or the yell of its whistle, without thinking of its long, jointed appearance and its headlong speed, nor catch a familiar voice in a crowd without recalling, with the name of the speaker, also his face. But the most notorious and important case of the mental combination of auditory with optical impressions originally experienced together is furnished by language. The child is offered a new and delicious fruit and is at the same time told that it is called a 'fig.' Or looking out of the window he exclaims, "What a funny horse!" and is told that it is a 'piebald' horse. When learning his letters, the sound of each is repeated to him whilst its shape is before his eye. Thenceforward, long as he may live, he will never see a fig, a piebald horse, or a letter of the alphabet without the name which he first heard in conjunction with each clinging to it in his mind; and inversely he will never hear the name without the faint arousal of the image of the object.^[465]

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THE RAPIDITY OF ASSOCIATION.

Reading exemplifies this kind of cohesion even more beautifully. It is an uninterrupted and protracted recall of sounds by sights which have always been coupled with them in the past. I find that I can name six hundred letters in two minutes on a printed page. Five distinct acts of association between sight and sound (not to speak of all the other processes concerned) must then have occurred in each second in my mind. In reading entire words the speed is much more rapid. Valentin relates in his *Physiology* that the reading of a single page of the proof, containing 2629 letters, took him 1 minute and 32 seconds. In this experiment each letter was *understood* in 1/28 of a second, but owing to the integration of letters into entire words, forming each a single aggregate impression directly associated with a single acoustic image, we need not suppose as many as 28 separate associations in a sound. The figures, however, suffice to show with what extreme rapidity an actual sensation recalls its customary associates. Both in fact seem to our ordinary attention to come into the mind at once.

The time-measuring psychologists of recent days have tried their hand at this problem by more elaborate methods. Galton, using a very simple apparatus, found that the sight of an unforeseen word would awaken an associated 'idea' in about 5/6 of a second.^[466] Wundt next made determinations in which the 'cue' was given by single-syllabled words called out by an assistant. The person experimented on had to press a key as soon as the sound of the word awakened an associated idea. Both word and reaction were chronographically registered, and the total time-interval between the two amounted, in four observers, to 1.009, 0.896, 1.037, and 1.154 seconds respectively. From this the simple physiological reaction-time and the time of merely identifying the word's sound (the 'apperception-time,' as Wundt calls it) must be subtracted, to get the exact time required for the associated idea to arise. These times were separately determined and subtracted. The difference, called by Wundt the *association-time*, amounted, in the same four persons, to 706, 723, 752, and 874 thousandths of a second respectively.^[467] The length of the last figure is due to the fact that the person reacting (President G. S. Hall) was an American, whose associations with German words would naturally be slower than those of natives. The shortest association-time noted was

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when the word 'Sturm' suggested to Prof. Wundt the word 'Wind' in 0.341 second.^[468]— Finally, Mr. Cattell made some interesting observations upon the association-time between the look of letters and their names. "I pasted letters," he says, "on a revolving drum, and determined at what rate they could be read aloud as they passed by a slit in a screen." He found it to vary according as one, or more than one letter, was visible at a time through the slit, and gives half a second as about the time which it takes to see and name a single letter seen alone.

"When two or more letters are always in view, not only do the processes of seeing and naming overlap, but while the subject is seeing one letter he begins to see the ones next following, and so can read them more quickly. Of the nine persons experimented on, four could read the letters faster when five were in view at once, but were not helped by a sixth letter; three were not helped by a fifth, and two not by a fourth letter. This shows that while one idea is in the centre, two, three, or four additional ideas may be in the background of consciousness. The second letter in view shortens the time about 1/40, the third 1/60, the fourth 1/100, the fifth 1/200 sec.

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"I find it takes about twice as long to read (aloud, as fast as possible) words which have no connection as words which make sentences and letters which have no connection as letters which make words. When the words make sentences and the letters words, not only do the processes of seeing and naming overlap, but by one mental effort the subject can recognize a whole group of words or letters, and by one will-act choose the motions to be made in naming, so that the rate at which the words and letters are read is really only limited by the maximum rapidity at which the speech-organs can be moved. As the result of a large number of experiments, the writer found that he had read words not making sentences at the rate of 1/4 sec, words making sentences (a passage from Swift) at the rate of 1/8 sec., per word.... The rate at which a person reads a foreign language is proportional to his familiarity with the language. For example, when reading as fast as possible the writer's rate was, English 138, French 167, German 250, Italian 327, Latin 434, and Greek 484; the figures giving the thousandths of a second taken to read each word. Experiments made on others strikingly confirm these results. The subject does not know that he is reading the foreign language more slowly than his own; this explains why foreigners seem to talk so fast. This simple method of determining a person's familiarity with a language might be used in school examinations.

"The time required to see and name colors and pictures of objects was determined in the same way. The time was found to be about the same (over 1/2 sec.) for colors as for pictures, and about twice as long as for words and letters. Other experiments I have made show that we can recognize a single color or picture in a slightly shorter time than a word or letter, but take longer to name it. This is because, in the case of words and letters, the association between the idea and name has taken place so often that the process has become automatic, whereas in the case of colors and pictures we must by a voluntary effort choose the name."^[469]

In later experiments Mr. Cattell studied the time for various associations to be performed, the termini (i.e., cue and answer) being words. A word in one language was to call up its equivalent in another, the name of an author the tongue in which he wrote, that of a city the country in which it lay, that of a writer one of his works, etc. The mean variation from the average is very great in all these experiments; and the interesting feature which they show is the existence of certain constant differences between associations of different sorts. Thus:

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From *country* to *city*, Mr. C.'s time was 0.340 sec.

From *season* to *month*, Mr. C.'s time was 0.399

From *language* to *author*, Mr. C.'s time was 0.523

From *author* to *work*, Mr. C.'s time was 0.596

The average time of two observers, experimenting on eight different types of association, was 0.420 and 0.436 sec. respectively.^[470] The very wide range of variation is undoubtedly a consequence of the fact that the words used as cues, and the different types of association studied, differ much in their degree of familiarity. [Pg 561]

"For example, B is a teacher of mathematics; C has busied himself more with literature. C knows quite as well as B that $7 + 5 = 12$, yet he needs 1/10 a second longer to call it to mind; B knows quite as well as C that Dante was a poet, but needs 1/20 of a second longer to think of it. Such experiments lay bare the mental life in a way that is startling and not always gratifying."^[471]

THE LAW OF CONTIGUITY.

Time-determinations apart, the facts we have run over can all be summed up in the simple statement that *objects once experienced together tend to become associated in the imagination, so that when any one of them is thought of, the others are likely to be thought of also, in the same order of sequence or coexistence as before.* This statement we may name the law of *mental association by contiguity*.^[472]

I preserve this name in order to depart as little as possible from tradition, although Mr. Ward's designation of the process as that of association by *continuity*^[473] or Wundt's as that of *external* association (to distinguish it from the *internal* association which we shall presently learn to know under the name of association by similarity)^[474] are perhaps better terms. Whatever we name the law, since it expresses merely a phenomenon of mental *habit*, *the most natural way of accounting for it is to conceive it as a result of the laws of habit in the nervous system; in other words, it is to ascribe it to a physiological cause.* If it be truly a law of those nerve-centres which co-ordinate sensory and motor processes together that paths once used for coupling any pair of them are thereby made more permeable, there appears no reason why the same law should not hold good of ideational centres and their coupling-paths as well.^[475] Parts of these centres which have once been in action together will thus grow so linked that excitement at one point will irradiate through the system. The chances of complete irradiation will be strong in proportion as the previous excitements have been frequent, and as the present points excited afresh are numerous. If all points were originally excited together, the irradiation may be sensibly simultaneous throughout the system, when any single point or group of points is touched off. But where the original impressions were successive—the conjugation of a Greek verb, for example—awakening nerve-tracts in a definite order, they will now, when one of them awakens, discharge into each other in that definite order and in no other way. [Pg 562]

The reader will recollect all that has been said of increased tension in nerve-tracts and of the summation of stimuli (p. 82 ff.). We must therefore suppose that in these ideational tracts as well as elsewhere, activity may be awakened, in any particular locality, by the summation therein of a number of tensions, each incapable alone of provoking an actual discharge. Suppose for example the locality M to be in functional continuity with four other localities, K, L, N, and O. Suppose moreover that on four previous occasions it has been separately combined with each of these localities in a common activity. M may then be indirectly awakened by any cause which tends to awaken either K, L, N, or O. But if the cause which awakens K, for instance, be so slight as only to increase its tension without arousing it to full discharge, K will only succeed in slightly increasing the tension of M. But if at the same [Pg 563]

time the tensions of L, N, and O are similarly increased, the combined effects of all four upon M may be so great as to awaken an actual discharge in this latter locality. In like manner if the paths between M and the four other localities have been so slightly excavated by previous experience as to require a very intense excitement in either of the localities before M can be awakened, a less strong excitement than this in any one will fail to reach M. But if all four at once are mildly excited, their compound effect on M may be adequate to its full arousal.

The psychological law of association of objects thought of through their previous contiguity in thought or experience would thus be an effect, within the mind, of the physical fact that nerve-currents propagate themselves easiest through those tracts of conduction which have been already most in use. Descartes and Locke hit upon this explanation, which modern science has not yet succeeded in improving.

"Custom," says Locke, "settles habits of thinking in the understanding, as well as of determining in the will, and of motions in the body; all which seem to be but *trains of motion in the animal spirits* [by this Locke meant identically what we understand by *neural processes*] which, once set agoing, continue in the same steps they have been used to, which by often treading are worn into a smooth path, and the motion in it becomes easy and, as it were, natural."^[476]

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Hartley was more thorough in his grasp of the principle. The sensorial nerve-currents, produced when objects are fully present, were for him 'vibrations,' and those which produce ideas of objects in their absence were 'miniature vibrations.' And he sums up the cause of mental association in a single formula by saying:

"Any vibrations, A, B, C, etc., by being associated together a sufficient Number of Times, get such a Power over *a, b, c, etc.*, the corresponding Miniature Vibrations, that any of the Vibrations A, when impressed alone, shall be able to excite *b, c, etc.*, the Miniatures of the rest."^[477]

It is evident that if there be any law of neural habit similar to this, the contiguities, coexistences, and successions, met with in outer experience, must inevitably be copied more or less perfectly in our thought. If A B C D E be a sequence of outer impressions (they may be events or they may be successively experienced properties of an object) which once gave rise to the successive 'ideas' *a b c d e*, then no sooner will A impress us again and awaken the *a*, than *b c d e* will arise as ideas even before B C D E have come in as impressions. In other words, the order of impressions will the next time be *anticipated*; and the mental order will so far forth copy the order of the outer world. Any object when met again will make us expect its former concomitants, through the overflowing of its brain-tract into the paths which lead to theirs. And all these suggestions will be effects of a material law.

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Where the associations are, as here, of successively appearing things, the distinction I made at the outset of the chapter, between a connection *thought of* and a connection *of thoughts*, is unimportant. For the connection thought of is concomitance or succession; and the connection between the thoughts is just the same. The 'objects' and the 'ideas' fit into parallel schemes, and may be described in identical language, as contiguous things tending to be thought again together, or contiguous ideas tending to recur together.

Now were these cases fair samples of all association, the distinction I drew might well be termed a *Spitzfindigkeit* or piece of pedantic hair-splitting, and be dropped. But as a matter of fact we cannot treat the subject so simply. The same outer object may suggest *either of many* realities formerly associated with it—for in the vicissitudes of our outer experience we are constantly liable to meet the same thing in the midst of differing companions—and a philosophy of association that should merely say that it will suggest one of these, or even of that one of them which it has oftenest accompanied, would go but a very short way into the

rationale of the subject. This, however, is about as far as most associationists have gone with their 'principle of contiguity.' Granted an object, A, they never tell us beforehand which of its associates it *will* suggest; their wisdom is limited to showing, after it *has* suggested a second object, that that object was once an associate. They have had to supplement their principle of Contiguity by other principles, such as those of Similarity and Contrast, before they could begin to do justice to the richness of the facts.

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THE ELEMENTARY LAW OF ASSOCIATION.

I shall try to show, in the pages which immediately follow, that there is no other *elementary* causal law of association than the law of neural habit. All the *materials* of our thought are due to the way in which one elementary process of the cerebral hemispheres tends to excite whatever other elementary process it may have excited at some former time. The number of elementary processes at work, however, and the nature of those which at any time are fully effective in rousing the others, determine the character of the total brain-action, and, as a consequence of this, they determine the object thought of at the time. According as this resultant object is one thing or another, we call it a product of association by contiguity or of association by similarity, or contrast, or whatever other sorts we may have recognized as ultimate. Its production, however, is, in each one of these cases, to be explained by a merely quantitative variation in the elementary brain-processes momentarily at work under the law of habit, so that *psychic* contiguity, similarity, etc., are derivatives of a single profounder kind of fact.

My thesis, stated thus briefly, will soon become more clear; and at the same time certain disturbing factors, which co-operate with the law of neural habit, will come to view.

Let us then assume as the *basis* of all our subsequent reasoning this law: *When two elementary brain-processes have been active together or in immediate succession, one of them, on reoccurring, tends to propagate its excitement into the other.*

But, as a matter of fact, every elementary process has found itself at different times excited in conjunction with *many* other processes, and this by unavoidable outward causes. Which of these others it shall awaken now becomes a problem. Shall *b* or *c* be aroused next by the present *a*? We must make a further postulate, based, however, on the fact of *tension* in nerve-tissue, and on the fact of summation of excitements, each incomplete or latent in itself, into an open resultant.^[478] The process *b*, rather than *c*, will awake, if in addition to the vibrating tract *a* some other tract *d* is in a state of sub-excitement, and formerly was excited with *b* alone and not with *a*. In short, we may say:

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The amount of activity at any given point in the brain-cortex is the sum of the tendencies of all other points to discharge into it, such tendencies being proportionate (1) to the number of times the excitement of each other point may have accompanied that of the point in question; (2) to the intensity of such excitements; and (3) to the absence of any rival point functionally disconnected with the first point, into which the discharges might be diverted.

Expressing the fundamental law in this most complicated way leads to the greatest ultimate simplification. Let us, for the present, only treat of spontaneous trains of thought and ideation, such as occur in revery or musing. The case of voluntary thinking toward a certain end shall come up later.

Take, to fix our ideas, the two verses from 'Locksley Hall':

"I, the heir of all *the ages* in the foremost files of time,"

and—

"For I doubt not through *the ages* one increasing purpose runs."

Why is it that when we recite from memory one of these lines, and get as far as *the ages*, that portion of the *other* line which follows, and, so to speak, sprouts out of *the ages*, does not also sprout out of our memory, and confuse the sense of our words? Simply because the word that follows *the ages* has its brain-process awakened not simply by the brain-process of *the ages* alone, but by it *plus* the brain-processes of all the words preceding *the ages*. The word *ages* at its moment of strongest activity would, *per se*, indifferently discharge into either 'in' or 'one.' So would the previous words (whose tension is momentarily much less strong than that of *ages*) each of them indifferently discharge into either of a large number of other words with which they have been at different times combined. But when the processes of '*I, the heir of all the ages*,' simultaneously vibrate in the brain, the last one of them in a maximal, the others in a fading phase of excitement; then the strongest line of discharge will be that which they *all alike* tend to take. '*In*' and not '*one*' or any other word will be the next to awaken, for its brain-process has previously vibrated in unison not only with that of *ages*, but with that of all those other words whose activity is dying away. It is a good case of the effectiveness over thought of what we called on p. 258 a 'fringe.'

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But if some one of these preceding words—'heir,' for example—had an intensely strong association with some brain-tracts entirely disjoined in experience from the poem of 'Locksley Hall'—if the reciter, for instance, were tremulously awaiting the opening of a will which might make him a millionaire—it is probable that the path of discharge through the words of the poem would be suddenly interrupted at the word 'heir.' His *emotional interest in that word* would be such that its *own special associations would prevail* over the combined ones of the other words. He would, as we say, be abruptly reminded of his personal situation, and the poem would lapse altogether from his thoughts.

The writer of these pages has every year to learn the names of a large number of students who sit in alphabetical order in a lecture-room. He finally learns to call them by name, as they sit in their accustomed places. On meeting one in the street, however, early in the year, the face hardly ever recalls the name, but it may recall the place of its owner in the lecture-room, his neighbors' faces, and consequently his general alphabetical position; and then, usually as the common associate of all these combined data, the student's name surges up in his mind.

A father wishes to show to some guests the progress of his rather dull child in Kindergarten instruction. Holding the knife upright on the table, he says, "What do you call that, my boy?" "I calls it a *knife*, I does," is the sturdy reply, from which the child cannot be induced to swerve by any alteration in the form of question, until the father recollecting that in the Kindergarten a pencil was used, and not a knife, draws a long one from his pocket, holds it in the same way, and then gets the wished-for answer, "I calls it *vertical*." All the concomitants of the Kindergarten experience had to recombine their effect before the word 'vertical' could be reawakened.

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Professor Bain, in his chapters on 'Compound Association,' has treated in a minute and exhaustive way of this type of mental sequence, and what he has done so well need not be here repeated.^[479]

Impartial Redintegration.

The ideal working of the law of compound association, were it unmodified by any extraneous influence, would be such as to keep the mind in a perpetual treadmill of concrete reminiscences from which no detail could be omitted. Suppose, for example, we begin by thinking of a certain dinner-party. The only thing which all the components of the dinner-party could combine to recall would be the first concrete occurrence which ensued upon it. All the details of this occurrence could in turn only combine to awaken the next following occurrence, and so on. If *a, b, c, d, e*, for instance, be the elementary nerve-tracts excited by the last act of the dinner-party, call this act *A*, and *l, m, n, o, p*, be those of walking home

through the frosty night, which we may call B, then the thought of A must awaken that of B, because *a, b, c, d, e*, will each and all discharge into *l* through the paths by which their original discharge took place. Similarly they will discharge into *m, n, o*, and *p*; and these latter tracts will also each reinforce the other's action because, in the experience B, they have already vibrated in unison. The lines in Fig. 40 symbolize the summation of discharges into each of the components of B, and the consequent strength of the combination of influences by which B in its totality is awakened.

Hamilton first used the word 'redintegration' to designate all association. Such processes as we have just described might in an emphatic sense be termed redintegrations, for they would necessarily lead, if unobstructed, to the reinstatement in thought of the *entire* content of large trains of past experience. From this complete redintegration there could be no escape save through the irruption of some new and strong present impression of the senses, or through the excessive tendency of some one of the elementary brain-tracts to discharge independently into an aberrant quarter of the brain. Such was the tendency of the word 'heir' in the verse from 'Locksley Hall,' which was our first example. How such tendencies are constituted we shall have soon to inquire with some care. Unless they are present, the panorama of the past, once opened, must unroll itself with fatal literality to the end, unless some outward sound, sight, or touch divert the current of thought.

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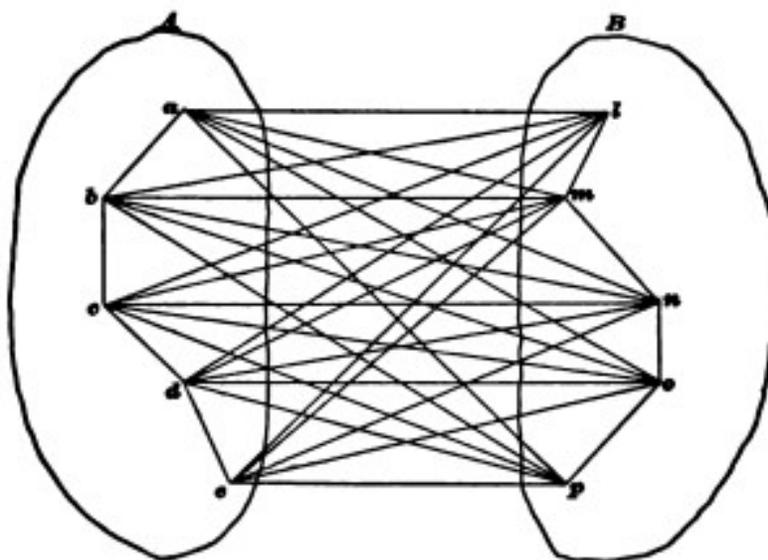


FIG. 40.

Let us call this process *impartial redintegration*. Whether it ever occurs in an absolutely complete form is doubtful. We all immediately recognize, however, that in some minds there is a much greater tendency than in others for the flow of thought to take this form. Those insufferably garrulous old women, those dry and fanciless beings who spare you no detail, however petty, of the facts they are recounting, and upon the thread of whose narrative all the irrelevant items cluster as pertinaciously as the essential ones, the slaves of literal fact, the stumblers over the smallest abrupt step in thought, are figures known to all of us. Comic literature has made her profit out of them. Juliet's nurse is a classical example. George Eliot's village characters and some of Dickens's minor personages supply excellent instances.

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Perhaps as successful a rendering as any of this mental type is the character of Miss Bates in Miss Austen's 'Emma.' Hear how she redintegrates:

"'But where could *you* hear it?' cried Miss Bates. 'Where could you possibly hear it, Mr. Knightley? For it is not five minutes since I received Mrs. Cole's note—no, it cannot be more than five—or at least ten—for I had got my bonnet and spencer on, just ready to come out—I was only gone down to speak to

Patty again about the pork—Jane was standing in the passage—were not you, Jane?—for my mother was so afraid that we had not any salting-pan large enough. So I said I would go down and see, and Jane said: "Shall I go down instead? for I think you have a little cold, and Patty has been washing the kitchen." "Oh, my dear," said I—well, and just then came the note. A Miss Hawkins—that's all I know—a Miss Hawkins, of Bath. But, Mr. Knightley, how could you possibly have heard it? for the very moment Mr. Cole told Mrs. Cole of it, she sat down and wrote to me. A Miss Hawkins—"

But in every one of us there are moments when this complete reproduction of all the items of a past experience occurs. What are those moments? They are moments of emotional recall of the past as something which once was, but is gone for ever—moments, the interest of which consists in the feeling that our self was once other than it now is. When this is the case, any detail, however minute, which will make the past picture more complete, will also have its effect in swelling that total contrast between *now* and *then* which forms the central interest of our contemplation.

ORDINARY OR MIXED ASSOCIATION.

This case helps us to understand why it is that the ordinary spontaneous flow of our ideas does not follow the law of impartial redintegration. *In no revival of a past experience are all the items of our thought equally operative in determining what the next thought shall be. Always some ingredient is prepotent over the rest.* Its special suggestions or associations in this case will often be different from those which it has in common with the whole group of items; and its tendency to awaken these outlying associates will deflect the path of our reverie. Just as in the original sensible experience our attention focalized itself upon a few of the impressions of the scene before us, so here in the reproduction of those impressions an equal partiality is shown, and some items are emphasized above the rest. What these items shall be is, in most cases of spontaneous reverie, hard to determine beforehand. In subjective terms we say that *the prepotent items are those which appeal most to our* INTEREST.

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Expressed in brain-terms, the law of interest will be: *some one brain-process is always prepotent above its concomitants in arousing action elsewhere.*

"Two processes," says Mr. Hodgson,^[480] "are constantly going on in redintegration. The one a process of corrosion, melting, decay; the other a process of renewing, arising, becoming.... No object of representation remains long before consciousness in the same state, but fades, decays, and becomes indistinct. Those parts of the object, however, which possess an interest resist this tendency to gradual decay of the whole object.... This inequality in the object—some parts, the uninteresting, submitting to decay; others, the interesting parts, resisting it—when it has continued for a certain time, ends in becoming a new object."

Only where the interest is diffused equally over all the parts (as in the emotional memory just referred to, where, as all *past*, they all interest us alike) is this law departed from. It will be least obeyed by those minds which have the smallest variety and intensity of interests—those who, by the general flatness and poverty of their æsthetic nature, are kept for ever rotating among the literal sequences of their local and personal history.

Most of us, however, are better organized than this, and our musings pursue an erratic course, swerving continually into some new direction traced by the shifting play of interest as it ever falls on some partial item in each complex representation that is evoked. Thus it so often comes about that we find ourselves thinking at two nearly adjacent moments of things separated by the whole diameter of space and time. Not till we carefully recall each step of

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our cogitation do we see how naturally we came by Hodgson's law to pass from one to the other. Thus, for instance, after looking at my clock just now (1879), I found myself thinking of a recent resolution in the Senate about our legal-tender notes. The clock called up the image of the man who had repaired its gong. He suggested the jeweller's shop where I had last seen him; that shop, some shirt-studs which I had bought there; they, the value of gold and its recent decline; the latter, the equal value of greenbacks, and this, naturally, the question of how long they were to last, and of the Bayard proposition. Each of these images offered various points of interest. Those which formed the turning-points of my thought are easily assigned. The gong was momentarily the most interesting part of the clock, because, from having begun with a beautiful tone, it had become discordant and aroused disappointment. But for this the clock might have suggested the friend who gave it to me, or any one of a thousand circumstances connected with clocks. The jeweller's shop suggested the studs, because they alone of all its contents were tinged with the egoistic interest of possession. This interest in the studs, their value, made me single out the material as its chief source, etc., to the end. Every reader who will arrest himself at any moment and say, "How came I to be thinking of just this?" will be sure to trace a train of representations linked together by lines of contiguity and points of interest inextricably combined. This is the ordinary process of the association of ideas as it spontaneously goes on in average minds. *We may call it* ORDINARY, *or* MIXED, ASSOCIATION.

Another example of it is given by Hobbes in a passage which has been quoted so often as to be classical:

"In a discourse of our present civil war, what could seem more impertinent than to ask (as one did) what was the value of a Roman penny? Yet the coherence to me was manifest enough. For the thought of the war introduced the thought of the delivering up the King to his enemies; the thought of that brought in the thought of the delivering up of Christ; and that again the thought of the thirty pence, which was the price of that treason: and thence easily followed that malicious question; and all this in a moment of time; for thought is quick."^[481]

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Can we determine, now, when a certain portion of the going thought has, by dint of its interest, become so prepotent as to make its own exclusive associates the dominant features of the coming thought—can we, I say, determine *which* of its own associates shall be evoked? For they are many. As Hodgson says:

"The interesting parts of the decaying object are free to combine again with any objects or parts of objects with which at any time they have been combined before. All the former combinations of these parts may come back into consciousness; one must; but which will?"

Mr. Hodgson replies:

"There can be but one answer: that which has been most *habitually* combined with them before. This new object begins at once to form itself in consciousness, and to group its parts round the part still remaining from the former object; part after part comes out and arranges itself in its old position; but scarcely has the process begun, when the original law of interest begins to operate on this new formation, seizes on the interesting parts and impresses them on the attention to the exclusion of the rest, and the whole process is repeated again with endless variety. I venture to propose this as a complete and true account of the whole process of redintegration."

In restricting the discharge from the interesting item into that channel which is simply most *habitual* in the sense of most frequent, Hodgson's account is assuredly imperfect. An image

by no means always revives its most frequent associate, although frequency is certainly one of the most potent determinants of revival. If I abruptly utter the word *swallow*, the reader, if by habit an ornithologist, will think of a bird; if a physiologist or a medical specialist in throat diseases, he will think of deglutition. If I say *date*, he will, if a fruit-merchant or an Arabian traveller, think of the produce of the palm; if an habitual student of history, figures with A.D. or B.C. before them will rise in his mind. If I say *bed, bath, morning*, his own daily toilet will be invincibly suggested by the combined names of three of its habitual associates. But frequent lines of transition are often set at naught. The sight of C. Goring's 'System der kritischen Philosophie' has most frequently awakened in me thoughts of the opinions therein propounded. The idea of suicide has never been connected with the volumes. But a moment since, as my eye fell upon them, suicide was the thought that flashed into my mind. Why? Because but yesterday I received a letter from Leipzig informing me that this philosopher's recent death by drowning was an act of self-destruction. Thoughts tend, then, to awaken their most recent as well as their most habitual associates. This is a matter of notorious experience, too notorious, in fact, to need illustration. If we have seen our friend this morning, the mention of his name now recalls the circumstances of that interview, rather than any more remote details concerning him. If Shakespeare's plays are mentioned, and we were last night reading 'Richard II.,' vestiges of that play rather than of 'Hamlet' or 'Othello' float through our mind. Excitement of peculiar tracts, or peculiar modes of general excitement in the brain, leave a sort of tenderness or exalted sensibility behind them which takes days to die away. As long as it lasts, those tracts or those modes are liable to have their activities awakened by causes which at other times might leave them in repose. Hence, *recency* in experience is a prime factor in determining revival in thought.^[482]

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Vividness in an original experience may also have the same effect as habit or recency in bringing about likelihood of revival. If we have once witnessed an execution, any subsequent conversation or reading about capital punishment will almost certainly suggest images of that particular scene. Thus it is that events lived through only once, and in youth, may come in after-years, by reason of their exciting quality or emotional intensity, to serve as types or instances used by our mind to illustrate any and every occurring topic whose interest is most remotely pertinent to theirs. If a man in his boyhood once talked with Napoleon, any mention of great men or historical events, battles or thrones, or the whirligig of fortune, or islands in the ocean, will be apt to draw to his lips the incidents of that one memorable interview. If the word *tooth* now suddenly appears on the page before the reader's eye, there are fifty chances out of a hundred that, if he gives it time to awaken any image, it will be an image of some operation of dentistry in which he has been the sufferer. Daily he has touched his teeth and masticated with them; this very morning he brushed them, chewed his breakfast and picked them; but the rarer and remoter associations arise more promptly because they were so much more intense.^[483]

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A fourth factor in tracing the course of reproduction is *congruity in emotional tone* between the reproduced idea and our mood. The same objects do not recall the same associates when we are cheerful as when we are melancholy. Nothing, in fact, is more striking than our utter inability to keep up trains of joyous imagery when we are depressed in spirits. Storm, darkness, war, images of disease, poverty, and perishing afflict unremittingly the imaginations of melancholiacs. And those of sanguine temperament, when their spirits are high, find it impossible to give any permanence to evil forebodings or to gloomy thoughts. In an instant the train of association dances off to flowers and sunshine, and images of spring and hope. The records of Arctic or African travel perused in one mood awaken no thoughts but those of horror at the malignity of Nature; read at another time they suggest only enthusiastic reflections on the indomitable power and pluck of man. Few novels so overflow with joyous animal spirits as 'The Three Guardsmen' of Dumas. Yet it may awaken in the mind of a reader depressed with sea-sickness (as the writer can personally testify) a most dismal and woeful consciousness of the cruelty and carnage of which heroes like Athos, Porthos, and Aramis make themselves guilty.

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Habit, recency, vividness, and emotional congruity are, then, all reasons why one representation rather than another should be awakened by the interesting portion of a departing thought. We may say with truth that *in the majority of cases the coming representation will have been either habitual, recent, or vivid, and will be congruous*. If all these qualities unite in any one absent associate, we may predict almost infallibly that that associate of the going thought will form an important ingredient in the coming thought. In spite of the fact, however, that the succession of representations is thus redeemed from perfect indeterminism and limited to a few classes whose characteristic quality is fixed by the nature of our past experience, it must still be confessed that an immense number of terms in the linked chain of our representations fall outside of all assignable rule. To take the instance of the clock given on [page 586](#). Why did the jeweller's shop suggest the shirt-studs rather than a chain which I had bought there more recently, which had cost more, and whose sentimental associations were much more interesting? Both chain and studs had excited brain-tracts simultaneously with the shop. The only reason why the nerve-stream from the shop-tract switched off into the stud-tract rather than into the chain-tract must be that the stud-tract happened at that moment to lie more open, either because of some accidental alteration in its nutrition or because the incipient sub-conscious tensions of the brain as a whole had so distributed their equilibrium, that it was more unstable here than in the chain-tract. Any reader's introspection will easily furnish similar instances. It thus remains true that to a certain extent, even in those forms of ordinary mixed association which lie nearest to impartial redintegration, *which* associate of the interesting item shall emerge must be called largely a matter of accident—accident, that is, for our intelligence. No doubt it is determined by cerebral causes, but they are too subtle and shifting for our analysis.

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ASSOCIATION BY SIMILARITY.

In partial or mixed association we have all along supposed the interesting portion of the disappearing thought to be of considerable extent, and to be sufficiently complex to constitute by itself a concrete object. Sir William Hamilton relates, for instance, that after thinking of Ben Lomond he found himself thinking of the Prussian system of education, and discovered that the links of association were a German gentleman whom he had met on Ben Lomond, Germany, etc. The interesting part of Ben Lomond, as he had experienced it, the part operative in determining the train of his ideas was the complex image of a particular man. But now let us suppose that that selective agency of interested attention, which may thus convert impartial redintegration into partial association—let us suppose that it refines itself still further and accentuates a portion of the passing thought, so small as to be no longer the image of a concrete thing, but only of an abstract quality or property. Let us moreover suppose that the part thus accentuated persists in consciousness (or, in cerebral terms, has its brain-process continue) after the other portions of the thought have faded. *This small surviving portion will then surround itself with its own associates* after the fashion we have already seen, and the relation between the new thought's object and the object of the faded thought will be a *relation of similarity*. The pair of thoughts will form an instance of what is called '*Association by Similarity*.'^[484]

The similars which are here associated, or of which the first is followed by the second in the mind, are seen to be *compounds*. Experience proves that this is always the case. *There is no tendency on the part of SIMPLE 'ideas,' attributes, or qualities to remind us of their like*. The thought of one shade of blue does not remind us of that of another shade of blue, etc., unless indeed we have in mind some general purpose like naming the tint, when we should naturally think of other blues of the scale, through 'mixed association' of purpose, names, and tints, together. But there is no elementary tendency of pure qualities to awaken their similars in the mind.

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We saw in the chapter on Discrimination that two compound things are similar when some one quality or group of qualities is shared alike by both, although as regards their other

qualities they may have nothing in common. The moon is similar to a gas-jet, it is also similar to a foot-ball; but a gas-jet and a foot-ball are not similar to each other. When we affirm the similarity of two compound things, we should always say *in what respect it obtains*. Moon and gas-jet are similar in respect of luminosity, and nothing else; moon and foot-ball in respect of rotundity, and nothing else. Foot-ball and gas-jet are in no respect similar—that is, they possess no common point, no identical attribute. Similarity, in compounds, is partial identity. When the *same* attribute appears in two phenomena, though it be their only common property, the two phenomena are similar in so far forth. To return now to our associated representations. If the thought of the moon is succeeded by the thought of a foot-ball, and that by the thought of one of Mr. X's railroads, it is because the attribute rotundity in the moon broke away from all the rest and surrounded itself with an entirely new set of companions—elasticity, leathery integument, swift mobility in obedience to human caprice, etc.; and because the last-named attribute in the foot-ball in turn broke away from its companions, and, itself persisting, surrounded itself with such new attributes as make up the notions of a 'railroad king,' of a rising and falling stock-market, and the like.

The gradual passage from impartial redintegration to similar association through what we have called ordinary mixed association may be symbolized by diagrams. Fig. 41 is impartial redintegration, Fig. 42 is mixed, and Fig. 43 similar association. A in each is the passing, B the coming thought. In 'impartial,' all parts of A are equally operative in calling up B. In 'mixed,' most parts of A are inert. The part M alone breaks out and awakens B. In 'similar,' the focalized part M is much smaller than in the previous case, and after awakening its new set of associates, instead of fading out itself, it continues persistently active along with them, forming an identical part in the two ideas, and making these, *pro tanto*, resemble each other.

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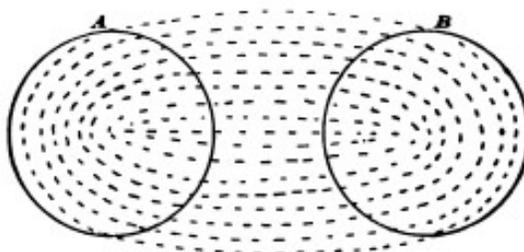


FIG. 41.

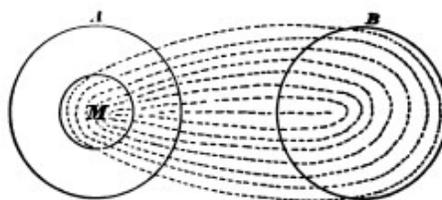


FIG. 42.

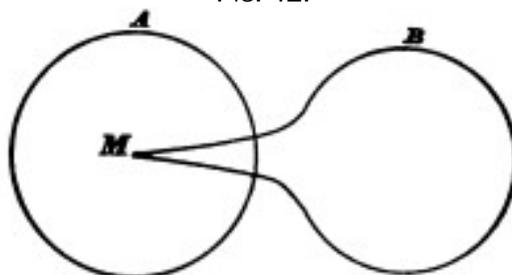


FIG. 43.

Why a single portion of the passing thought should break out from its concert with the rest and act, as we say, on its own hook, why the other parts should become inert, are mysteries which we can ascertain but not explain. Possibly a minuter insight into the laws of neural action will some day clear the matter up; possibly neural laws will not suffice, and we shall

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need to invoke a dynamic reaction of the form of consciousness upon its content. But into this we cannot enter now.

To sum up, then, we see that *the difference between the three kinds of association reduces itself to a simple difference in the amount of that portion of the nerve-tract supporting the going thought which is operative in calling up the thought which comes.* But the *modus operandi* of this active part is the same, be it large or be it small. The items constituting the coming object waken in every instance because their nerve-tracts once were excited continuously with those of the going object or its operative part. This ultimate physiological law of habit among the neural elements is what *runs* the train. The direction of its course and the form of its transitions, whether redintegrative, associative, or similar, are due to unknown regulative or determinative conditions which accomplish their effect by opening this switch and closing that, setting the engine sometimes at half-speed, and coupling or uncoupling cars.

This last figure of speech, into which I have glided unwittingly, affords itself an excellent instance of association by similarity. I was thinking of the deflections of the course of ideas. Now, from Hobbes's time downward, English writers have been fond of speaking of the *train* of our representations. This word happened to stand out in the midst of my complex thought with peculiarly sharp accentuation, and to surround itself with numerous details of railroad imagery. Only such details became clear, however, as had their nerve-tracts besieged by a double set of influences—those from *train* on the one hand, and those from the *movement of thought* on the other. It may possibly be that the prepotency of the suggestions of the word *train* at this moment were due to the recent excitation of the railroad brain-tract by the instance chosen a few pages back of ii railroad king playing foot-ball with the stock-market.

It is apparent from such an example how inextricably complex are all the contributory factors whose resultant is the line of our reverie. It would be folly in most cases to attempt to trace them out. From an instance like the above, where the pivot of the Similar Association was formed by a definite concrete word, *train*, to those where it is so subtle as utterly to elude our analysis, the passage is unbroken. We can form a series of examples. When Mr. Bagehot says that the mind of the savage, so far from being in a state of nature, is *tattooed* all over with monstrous superstitions, the case is very like the one we have just been considering. When Sir James Stephen compares our belief in the uniformity of nature, the congruity of the future with the past, to a man rowing one way and looking another, and steering his boat by keeping her stern in a line with an object behind him, the operative link becomes harder to dissect out. It is subtler still in Dr. Holmes's phrase, that stories in passing from mouth to mouth make a great deal of lee-way in proportion to their headway; or in Mr. Lowell's description of German sentences, that they have a way of yawing and going stern-foremost and not minding the helm for several minutes after it has been put down. And finally, it is a real puzzle when the color pale-blue is said to have feminine and blood-red masculine affinities. And if I hear a friend describe a certain family as having *blotting-paper* voices, the image, though immediately felt to be apposite, baffles the utmost powers of analysis. The higher poets all use abrupt epithets, which are alike intimate and remote, and, as Emerson says, sweetly torment us with invitations to their inaccessible homes.

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In these latter instances we must suppose that there is an identical portion in the similar objects, and that its brain-tract is energetically operative, without, however, being sufficiently isolable in its activity as to stand out *per se*, and form the condition of a distinctly discriminated 'abstract idea.' We cannot even by careful search see the bridge over which we passed from the heart of one representation to that of the next. In some brains, however, this mode of transition is extremely common. It would be one of the most

important of physiological discoveries could we assign the mechanical or chemical difference which makes the thoughts of one brain cling close to impartial redintegration, while those of another shoot about in all the lawless revelry of similarity. Why, in these latter brains, action should tend to focalize itself in small spots, while in the others it fills patiently its broad bed, it seems impossible to guess. Whatever the difference may be, it is what separates the man of genius from the prosaic creature of habit and routine thinking. In Chapter XXII we shall need to recur again to this point.

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ASSOCIATION IN VOLUNTARY THOUGHT.

Hitherto we have assumed the process of suggestion of one object by another to be spontaneous. The train of imagery wanders at its own sweet will, now trudging in sober grooves of habit, now with a hop, skip, and jump darting across the whole field of time and space. This is revery, or musing; but great segments of the flux of our ideas consist of something very different from this. They are guided by a distinct purpose or conscious interest. As the Germans say, we *nachdenken*, or think towards a certain end. It is now necessary to examine what modification is made in the trains of our imagery by the having of an end in view. The course of our ideas is then called *voluntary*.

Physiologically considered, we must suppose that a purpose means the persistent activity of certain rather definite brain-processes throughout the whole course of thought. Our most usual cogitations are not pure reveries, absolute driftings, but revolve about some central interest or topic to which most of the images are relevant, and towards which we return promptly after occasional digressions. This interest is subserved by the persistently active brain-tracts we have supposed. In the mixed associations which we have hitherto studied, the parts of each object which form the pivots on which our thoughts successively turn have their interest largely determined by their connection with some *general interest* which for the time has seized upon the mind. If we call Z the brain-tract of general interest, then, if the object *abc* turns up, and *b* has more associations with Z than have either *a* or *c*, *b* will become the object's interesting, pivotal portion, and will call up its own associates exclusively. For the energy of *b*'s brain-tract will be augmented by Z's activity,—an activity which, from lack of previous connection between Z and *a* or *c*, does not influence *a* or *c*. If, for instance, I think of Paris whilst I am *hungry*, I shall not improbably find that its *restaurants* have become the pivot of my thought, etc., etc.

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But in the theoretic as well as in the practical life there are interests of a more acute sort, taking the form of definite images of some achievement, be it action or acquisition, which we desire to effect. The train of ideas arising under the influence of such an interest constitutes usually the thought of the *means* by which the end shall be attained. If the end by its simple presence does not instantaneously suggest the means, the search for the latter becomes an intellectual *problem*. The solution of problems is the most characteristic and peculiar sort of voluntary thinking. Where the end thought of is some outward deed or gain, the solution is largely composed of the actual motor processes, walking, speaking, writing, etc., which lead up to it. Where the end is in the first instance only ideal, as in laying out a place of operations, the steps are purely imaginary. In both of these cases the discovery of the means may form a new sort of end, of an entirely peculiar nature, an end, namely, which we intensely desire before we have attained it, but of the nature of which, even whilst most strongly craving it, we have no distinct imagination whatever. Such an end is a problem.

The same state of things occurs whenever we seek to recall something forgotten, or to state the reason for a judgment which we have made intuitively. The desire strains and presses in a direction which it feels to be right but towards a point which it is unable to see. In short, the *absence of an item* is a determinant of our representations quite as positive as its presence can ever be. The gap becomes no mere void, but what is called an *aching* void. If we try to explain in terms of brain-action how a thought which only potentially exists can

yet be effective, we seem driven to believe that the brain-tract thereof must actually be excited, but only in a minimal and sub-conscious way. Try, for instance, to symbolize what goes on in a man who is racking his brains to remember a thought which occurred to him last week. The associates of the thought are there, many of them at least, but they refuse to awaken the thought itself. We cannot suppose that they do not irradiate *at all* into its brain-tract, because his mind quivers on the very edge of its recovery. Its actual rhythm sounds in his ears; the words seem on the imminent point of following, but fail. What it is that blocks the discharge and keeps the brain-excitement here from passing beyond the nascent into the vivid state cannot be guessed. But we see in the philosophy of desire and pleasure, that such nascent excitements, spontaneously tending to a crescendo, but inhibited or checked by other causes, may become potent mental stimuli and determinants of desire. All questioning, wonder, emotion of curiosity, must be referred to cerebral causes of some such form as this. The great difference between the effort to recall things forgotten and the search after the means to a given end, is that the latter have not, whilst the former have, already formed a part of our experience. If we first study *the mode of recalling a thing forgotten*, we can take up with better understanding the voluntary quest of the unknown.

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The forgotten thing is felt by us as a gap in the midst of certain other things. If it is a thought, we possess a dim idea of where we were and what we were about when it occurred to us. We recollect the general subject to which it relates. But all these details refuse to shoot together into a solid whole, for the lack of the vivid traits of this missing thought, the relation whereof to each detail forms now the main interest of the latter. We keep running over the details in our mind, dissatisfied, craving something more. From each detail there radiate lines of association forming so many tentative guesses. Many of these are immediately seen to be irrelevant, are therefore void of interest, and lapse immediately from consciousness. Others are associated with the other details present, and with the missing thought as well. When *these* surge up, we have a peculiar feeling that we are 'warm,' as the children say when they play hide and seek; and such associates as these we clutch at and keep before the attention. Thus we recollect successively that when we had the thought in question we were at the dinner-table; then that our friend J. D. was there; then that the subject talked about was so and so; finally, that the thought came *à propos* of a certain anecdote, and then that it had something to do with a French quotation. Now all these added associations *arise independently of the will*, by the spontaneous process we know so well. *All that the will does is to emphasize and linger over those which seem pertinent, and ignore the rest.* Through this hovering of the attention in the neighborhood of the desired object, the accumulation of associates becomes so great that the combined tensions of their neural processes break through the bar, and the nervous wave pours into the tract which has so long been awaiting its advent. And as the expectant, sub-conscious itching there, bursts into the fulness of vivid feeling, the mind finds an inexpressible relief.

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The whole process can be rudely symbolized in a diagram. Call the forgotten thing Z, the first facts with which we felt it was related, *a*, *b*, and *c*, and the details finally operative in calling it up, *l*, *m*, and *n*. Each circle will then stand for the brain-process underlying the thought of the object denoted by the letter contained within it. The activity in Z will at first be a mere tension; but as the activities in *a*, *b*, and *c* little by little irradiate into *l*, *m*, and *n*, and as *all* these processes are somehow connected with Z, their combined irradiations upon Z, represented by the centripetal arrows, succeed in helping the tension there to overcome the resistance, and in rousing Z also to full activity.

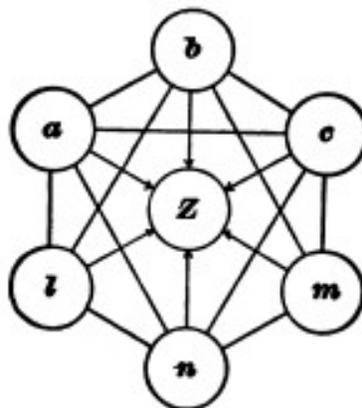


FIG. 44.

The tension present from the first in Z, even though it keep below the threshold of discharge, is probably to some degree co-operative with *a*, *b*, *c* in determining that *l*, *m*, *n* shall awake. Without Z's tension there might be a slower accumulation of objects connected with it. But, as aforesaid, the objects come before us through the brain's own laws, and the Ego of the thinker can only remain on hand, as it were, to recognize their relative values and brood over some of them, whilst others are let drop. As when we have lost a material object we cannot recover it by a direct effort, but only through moving about such neighborhoods wherein it is likely to lie, and trusting that it will then strike our eye; so here, by not letting our attention leave the neighborhood of what we seek, we trust that it will end by speaking to us of its own accord.^[485] [Pg 587]

Turn now to the case of finding the unknown means to a distinctly conceived end. The end here stands in the place of *a*, *b*, *c*, in the diagram. It is the starting-point of the irradiations of suggestion; and here, as in that case, what the voluntary attention does is only to dismiss some of the suggestions as irrelevant, and hold fast to others which are felt to be more pertinent—let these be symbolized by *l*, *m*, *n*. These latter at last accumulate sufficiently to discharge all together into Z, the excitement of which process is, in the mental sphere, equivalent to the solution of our problem. The only difference between this case and the last, is that in this one there need be no original sub-excitement in Z, co-operating from the very first. When we seek a forgotten name, we must suppose the name's centre to be in a state of active tension from the very outset, because of that peculiar feeling of *recognition* which we get at the moment of recall. The plenitude of the thought seems here but a maximum degree of something which our mind divined in advance. It instantaneously fills a socket completely moulded to its shape; and it seems most natural to ascribe the identity of quality in our feeling of the gaping socket and our feeling of what comes to fill it, to the sameness of a nerve-tract excited in different degrees. In the solving of a problem, on the contrary, the recognition that we have found the means is much less immediate. Here, what we are aware of in advance seems to be its relations with the items we already know. It must bear a causal relation, or it must be an effect, or it must contain an attribute common to two items, or it must be a uniform concomitant, or what not. We know, in short, a lot *about* it, whilst as yet we have no knowledge of *acquaintance* with it (see p. 221), or in Mr. Hodgson's language, "we know what we want to find beforehand, in a certain sense, in its second intention, and do not know it, in another sense, in its first intention."^[486] Our intuition that one of the ideas which turn up is, at last, our *quæsitum*, is due to our recognition that its relations are identical with those we had in mind, and this may be a rather slow act of judgment. In fact, every one knows that an object may be for some time present to his mind before its relations to other matters are perceived. To quote Hodgson again:

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"The mode of operation is common to voluntary memory and reason.... But reasoning adds to memory the function of comparing or judging the images which arise.... Memory aims at filling the gap with an image which has at some particular time filled it before, reasoning with one which bears certain time-and space-relations to the images before and after" —

or, to use perhaps clearer language, one which stands in determinate logical relations to those data round about the gap which filled our mind at the start. This feeling of the blank form of relationship before we get the material quality of the thing related will surprise no one who has read [Chapter IX](#). [Pg 589]

From the guessing of newspaper enigmas to the plotting of the policy of an empire there is no other process than this. We trust to the laws of cerebral nature to present us spontaneously with the appropriate idea:

"Our only command over it is by the effort we make to keep the painful unfilled gap in consciousness.^[487]... Two circumstances are important to notice: the first is, that volition has no power of calling up images, but only of rejecting and selecting from those offered by spontaneous redintegration.^[488] But the rapidity with which this selection is made, owing to the familiarity of the ways in which spontaneous redintegration runs, gives the process of reasoning the appearance of evoking images that are foreseen to be conformable to the purpose. There is no seeing them before they are offered; there is no summoning them before they are seen. The other circumstance is, that every kind of reasoning is nothing, in its simplest form, but attention."^[489]

It is foreign to our purpose here to enter into any detailed analysis of the different classes of mental pursuit. In a scientific research we get perhaps as rich an example as can be found. The inquirer starts with a fact of which he seeks the reason, or with an hypothesis of which he seeks the proof. In either case he keeps turning the matter incessantly in his mind until, by the arousal of associate upon associate, some habitual, some similar, one arises which he recognizes to suit his need. This, however, may take years. No rules can be given by which the investigator may proceed straight to his result; but both here and in the case of reminiscence the accumulation of helps in the way of associations may advance more rapidly by the use of certain routine methods. In striving to recall a thought, for example, we may of set purpose run through the successive classes of circumstance with which it may possibly have been connected, trusting that when the right member of the class has turned up it will help the thought's revival. Thus we may run through all the *places* in which we may have had it. We may run through the *persons* whom we remember to have conversed with, or we may call up successively all the *books* we have lately been reading. If we are trying to remember a person we may run through a list of streets or of professions. Some item out of the lists thus methodically gone over will very likely be associated with the fact we are in need of, and may suggest it or help to do so. And yet the item might never have arisen without such systematic procedure. In scientific research this accumulation of associates has been methodized by Mill under the title of 'The Four Methods of Experimental Inquiry.' By the 'method of agreement,' by that of 'difference,' by those of 'residues' and 'concomitant variations'(which cannot here be more nearly defined), we make certain lists of cases; and by ruminating these lists in our minds the cause we seek will be more likely to emerge. But the final stroke of discovery is only prepared, not effected, by them. The brain-tracts must, of their own accord, shoot the right way at last, or we shall still grope in darkness. That in some brains the tracts *do* shoot the right way much oftener than in others, and that we cannot tell why,—these are ultimate facts to which we must never close our eyes. Even in forming our lists of instances according to Mill's methods, we are at the mercy of the spontaneous workings of Similarity in our brain. How are a number of facts, [Pg 590]

resembling the one whose cause we seek, to be brought together in a list unless the one will rapidly suggest the other through association by similarity?

SIMILARITY NO ELEMENTARY LAW.

Such is the analysis I propose, first of the three main types of spontaneous association, and then of voluntary association. It will be observed that the *object called up may bear any logical relation whatever to the one which suggested it*. The law requires only that one condition should be fulfilled. The fading object must be due to a brain-process some of whose elements awoken through habit some of the elements of the brain-process of the object which comes to view. This awakening is the operative machinery, the causal agency, throughout, quite as much so in the kind of association I have called by the name of Similarity, as in any other sort. The similarity between the objects, or between the thoughts (if similarity there be between these latter), has no causal agency in carrying us from one to the other. It is but a result—the effect of the usual causal agent when this happens to work in a certain particular and assignable way. But ordinary writers talk as if the similarity of the objects were itself an agent, co-ordinate with habit, and independent of it, and like it able to push objects before the mind. This is quite unintelligible. The similarity of two things does not exist till both things are there—it is meaningless to talk of it as an *agent of production* of anything, whether in the physical or the psychical realms.^[490] It is a relation which the mind perceives after the fact, just as it may perceive the relations of superiority, of distance, of causality, of container and content, of substance and accident, or of contrast, between an object and some second object which the associative machinery calls up.^[491]

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There are, nevertheless, able writers who not only insist on preserving association by similarity as a distinct elementary law, but who make it the most elementary law, and seek to derive contiguous association from it. Their reasoning is as follows: When the present impression *A* awakens the idea *b* of its past contiguous associate *B*, how can this occur except through first reviving an image *a* of its own past occurrence. *This* is the term directly connected with *b*; so that the process instead of being simply *A—b* is *A—a—b*. Now *A* and *a* are similars; therefore no association by contiguity can occur except through a previous association by similarity. The most important supposition here made is that every impression on entering the mind must needs awaken an image of its past self, in the light of which it is 'apperceived' or understood, and through the intermediation of which it enters into relation with the mind's other objects. This assumption is almost universally made; and yet it is hard to find any good reason for it. It first came before us when we were reviewing the facts of aphasia and mental blindness (see [p. 50](#) ff.). But we then saw no need of optical and auditory images to interpret optical and auditory sensations by. On the contrary, we agreed that auditory sensations were understood by us only so far as they awakened *non-auditory* images, and optical sensations only so far as they awakened *non-optical* images. In the chapters on Memory, on Reasoning, and on Perception the same assumption will meet us again, and again will have to be rejected as groundless. The sensational process *A* and the ideational process *a* probably occupy essentially the same tracts. When the outer stimulus comes and those tracts vibrate with the sensation *A*, they discharge as directly into the paths which lead to *B* as when there is no outer stimulus and they only vibrate with the idea *a*. To say that the process *A* can only reach these paths by the help of the weaker process *a* is like saying that we need a candle to see the sun by. *A* replaces *a*, does all that *a* does and more; and there is no intelligible meaning, to my mind, in saying that the weaker process coexists with the stronger. I therefore consider that these writers are altogether wrong. The only plausible proof they give of the coexistence of *a* with *A* is when *A* gives us a *sense of familiarity* but fails to awaken any distinct thought of past contiguous associates. In a later chapter I shall consider this case. Here I content myself with saying that it does not seem conclusive as to the point at issue; and that I still believe association of coexistent or sequent impressions to be the one *elementary* law.

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CONTRAST *has also been held to be an independent agent in association.* But the reproduction of an object contrasting with one already in the mind is easily explained on our principles. Recent writers, in fact, all reduce it either to similarity or contiguity. Contrast always presupposes generic similarity; it is only the *extremes of a class* which are contrasted, black and white, not black and sour, or white and prickly. A machinery which reproduces a similar at all, may reproduce the *opposite* similar, as well as any intermediate term. Moreover, the greater number of contrasts are habitually coupled in speech, young and old, life and death, rich and poor, etc., and are, as Dr. Bain says, in everybody's memory. [492]

I trust that the student will now feel that the way to a deeper understanding of the order of our ideas lies in the direction of cerebral physiology. The *elementary* process of revival can be nothing but the law of habit. Truly the day is distant when physiologists shall actually trace from cell-group to cell-group the irradiations which we have hypothetically invoked. Probably it will never arrive. The schematism we have used is, moreover, taken immediately from the analysis of objects into their elementary parts, and only extended by analogy to the brain. And yet it is only as incorporated in the brain that such a schematism can represent anything *causal*. This is, to my mind, the conclusive reason for saying that the order of *presentation of the mind's materials* is due to cerebral physiology alone.

The law of accidental prepotency of certain processes over others falls also within the sphere of cerebral probabilities. Granting such instability as the brain-tissue requires, certain points must always discharge more quickly and strongly than others; and this prepotency would shift its place from moment to moment by accidental causes, giving us a perfect mechanical diagram of the capricious play of similar association in the most gifted mind. The study of dreams confirms this view. The usual abundance of paths of irradiation seems, in the dormant brain, reduced. A few only are pervious, and the most fantastic sequences occur because the currents run—'like sparks in burnt-up paper'—wherever the nutrition of the moment creates an opening, but nowhere else.

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The *effects of interested attention and volition* remain. These activities seem to hold fast to certain elements, and by emphasizing them and dwelling on them, to make their associates the only ones which are evoked. *This* is the point at which an anti-mechanical psychology must, if anywhere, make it stand in dealing with association. Everything else is pretty certainly due to cerebral laws. My own opinion on the question of active attention and spiritual spontaneity is expressed elsewhere. But even though there be a mental spontaneity, it can certainly not create ideas or summon them *ex abrupto*. Its power is limited to *selecting* amongst those which the associative machinery has already introduced or tends to introduce. If it can emphasize, reinforce, or protract for a second either one of these, it can do all that the most eager advocate of free will need demand; for it then decides the direction of the next associations by making them hinge upon the emphasized term; and determining in this wise the course of the man's thinking, it also determines his acts.

THE HISTORY OF OPINION CONCERNING ASSOCIATION

may be briefly glanced at ere we end the chapter.^[493] Aristotle seems to have caught both the facts and the principle of explanation; but he did not expand his views, and it was not till

the time of Hobbes that the matter was again touched on in a definite way. Hobbes first formulated the problem of the succession of our thoughts. He writes in *Leviathan*, chapter iii, as follows:

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"By consequence, or train of thoughts, I understand that succession of one thought to another which is called, to distinguish it from discourse in words, *mental discourse*. When a man thinketh on anything whatsoever, his next thought after is not altogether so casual as it seems to be. Not every thought to every thought succeeds indifferently. But as we have no imagination, whereof we have not formerly had sense, in whole or in parts; so we have no transition from one imagination to another, whereof we never had the like before in our senses. The reason whereof is this. All fancies are motions within us, relics of those made in the sense: and those motions that immediately succeeded one another in the sense continue also together after sense: insomuch as the former coming again to take place, and be predominant, the latter followeth, by coherence of the matter moved, in such manner, as water upon a plane table is drawn which way any one part of it is guided by the finger. But because in sense, to one and the same thing perceived, sometimes one thing, sometimes another succeedeth, it comes to pass in time that, in the imagining of anything, there is no certainty what we shall imagine next; only this is certain, it shall be something that succeeded the same before, at one time or another. This train of thoughts, or mental discourse, is of two sorts. The first is *unguided, without design*, and inconstant; wherein there is no passionate thought, to govern and direct those that follow, to itself, as the end and scope of some desire, or other passion.... The second is more constant; as being *regulated* by some desire and design. For the impression made by such things as we desire, or fear, is strong and permanent, or, if it cease for a time, of quick return: so strong is it, sometimes, as to hinder and break our sleep. From desire ariseth the thought of some means we have seen produce the like of that which we aim at; and from the thought of that, the thought of means to that mean; and so continually, till we come to some beginning within our own power. And because the end, by the greatness of the impression, comes often to mind, in case our thoughts begin to wander, they are quickly again reduced into the way: which observed by one of the seven wise men, made him give men this precept, which is now worn out, *Respite finem*; that is to say, in all your actions, look often upon what you would have, as the thing that directs all your thoughts in the way to attain it.

"The train of regulated thoughts is of two kinds; one, when of an effect imagined we seek the causes, or means that produce it: and this is common to man and beast. The other is, when imagining anything whatsoever, we seek all the possible effects that can by it be produced; that is to say, we imagine what we can do with it, when we have it. Of which I have not at any time seen any sign, but in man only; for this is a curiosity hardly incident to the nature of any living creature that has no other passion but sensual, such as are hunger, thirst, lust, and anger. In sum, the discourse of the mind, when it is governed by design, is nothing but *seeking* or the faculty of invention, which the Latins called *sagacitas*, and *sollertia*; a hunting out of the causes, of some effect, present or past; or of the effects, of some present or past cause."

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The most important passage after this of Hobbes is Hume's:

"As all simple ideas may be separated by the imagination, and may be united again in what form it pleases, nothing would be more unaccountable than the operations of that faculty, were it not guided by some universal principles, which render it, in some measure, uniform with itself in all times and places.

Were ideas entirely loose and unconnected, chance alone would join them; and 'tis impossible the same simple ideas should fall regularly into complex ones (as they commonly do) without some bond of union among them, some associating quality, by which one idea naturally introduces another. This uniting principle among ideas is not to be considered as an inseparable connection; for that has been already excluded from the imagination. Nor yet are we to conclude that without it the mind cannot join two ideas; for nothing is more free than that faculty: but we are only to regard it as a gentle force, which commonly prevails, and is the cause why, among other things, languages so nearly correspond to each other; nature in a manner pointing to every one those simple ideas which are most proper to be united in a complex one. The qualities from which this association arises, and by which the mind is after this manner conveyed from one idea to another, are three, viz., RESEMBLANCE, CONTIGUITY in time or place, and CAUSE and EFFECT.

"I believe it will not be very necessary to prove that these qualities produce an association among ideas, and upon the appearance of one idea naturally introduce another. 'Tis plain that in the course of our thinking, and in the constant revolution of our ideas, our imagination runs easily from one idea to any other that *resembles* it, and that this quality alone is to the fancy a sufficient bond and association. 'Tis likewise evident, that as the senses, in changing their objects, are necessitated to change them regularly, and take them as they lie *contiguous* to each other, the imagination must by long custom acquire the same method of thinking, and run along the parts of space and time in conceiving its objects. As to the connection that is made by the relation of *cause and effect*, we shall have occasion afterwards to examine it to the bottom, and therefore shall not at present insist upon it. 'Tis sufficient to observe that there is no relation which produces a stronger connection in the fancy, and makes one idea more readily recall another, than the relation of cause and effect betwixt their objects.... These are therefore the principles of union or cohesion among our simple ideas, and in the imagination supply the place of that inseparable connection by which they are united in our memory. Here is a kind of ATTRACTION, which in the mental world will be found to have as extraordinary effects as in the natural, and to show itself in as many and as various forms. Its effects are everywhere conspicuous; but as to its causes, they are mostly unknown, and must be resolved into *original* qualities of human nature, which I pretend not to explain."^[494]

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Hume did not, however, any more than Hobbes, follow out the effects of which he speaks, and the task of popularizing the notion of association and making an effective school based on association of ideas alone was reserved for Hartley^[495] and James Mill.^[496] These authors traced minutely the presence of association in all the cardinal notions and operations of the mind. The several 'faculties' of the Mind were dispossessed; the one principle of association between ideas did all their work. As Priestley says:

"Nothing is requisite to make any man whatever he is, but a sentient principle with this single law.... Not only all our intellectual pleasures and pains but all the phenomena of memory, imagination, volition, reasoning and every other mental affection and operation, are but different modes or cases of the association of ideas."^[497]

An eminent French psychologist, M. Ribot, repeats Hume's comparison of the law of association with that of gravitation, and goes on to say:

"It is remarkable that this discovery was made so late. Nothing is simpler, apparently, than to notice that this law of association is the truly fundamental, irreducible phenomenon of our mental life; that it is at the bottom of all our acts; that it permits of no exception; that neither dream, reverie, mystic ecstasy, nor the most abstract reasoning can exist without it; that its suppression would be equivalent to that of thought itself. Nevertheless no ancient author understood it, for one cannot seriously maintain that a few scattered lines in Aristotle and the Stoics constitute a theory and clear view of the subject. It is to Hobbes, Hume, and Hartley that we must attribute the origin of these studies on the connection of our ideas. The discovery of the ultimate law of our psychologic acts has this, then, in common with many other discoveries: it came late and seems so simple that it may justly astonish us.

"Perhaps it is not superfluous to ask in what this manner of explanation is superior to the current theory of Faculties.^[498] The most extended usage consists, as we know, in dividing intellectual phenomena into classes, in separating those which differ, in grouping together those of the same nature and in giving to these a common name and in attributing them to the same cause; it is thus that we have come to distinguish those diverse aspects of intelligence which are called judgment, reasoning, abstraction, perception, etc. This method is precisely the one followed in Physics, where the words caloric, electricity, gravity, designate the unknown causes of certain groups of phenomena. If one thus never forgets that the diverse faculties are only the unknown causes of known phenomena, that they are simply a convenient means of classifying the facts and speaking of them, if one does not fall into the common fault of making out of them substantial entities, creations which now agree, now disagree, so forming in the intelligence a little republic; then, we can see nothing reprehensible in this distribution into faculties, conformable as it is to the rules of a sound method and of a good natural classification. In what then is Mr. Bain's procedure superior to the method of the faculties? It is that the latter is simply a *classification* while his is an *explanation*. Between the psychology which traces intellectual facts back to certain faculties, and that which reduces them to the single law of association, there is, according to our way of thinking, the same difference that we find in Physics between those who attribute its phenomena to five or six causes, and those who derive gravity caloric, light, etc., from motion. The system of the faculties explains nothing because each one of them is only a *flatus vocis* which is of value merely through the phenomena which it contains, and signifies nothing more than these phenomena. The new theory, on the contrary, shows that the different processes of intelligence are only diverse cases of a single law; that imagination, deduction, induction, perception, etc., are but so many determinate ways in which ideas may combine with each other; and that the differences of faculties are only differences of association. It *explains* all intellectual facts, certainly not after the manner of Metaphysics which demands the ultimate and absolute reason of things; but after the manner of Physics which seeks only their secondary and immediate cause."^[499]

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The inexperienced reader may be glad of a brief indication of the manner in which all the different mental operations may be conceived to consist of images of sensation associated together.

Memory is the association of a present image with others known to belong to the past. *Expectation* the same, with future substituted for past. *Fancy*, the association of images without temporal order.

Belief in anything *not* present to sense is the very lively, strong, and steadfast association of the image of that thing with some present sensation, so that as long as the sensation persists the image cannot be excluded from the mind. [Pg 599]

Judgment is 'transferring the idea of *truth* by association from one proposition to another that resembles it.'^[500]

Reasoning is the perception that "whatever has any mark has that which it is a mark of"; in the concrete case the mark or middle term being always *associated* with each of the other terms and so serving as a link by which they are themselves indirectly associated together. This same kind of transfer of a sensible experience associated with another to a third also associated with that other, serves to explain emotional facts. When we are pleased or hurt we express it, and the expression associates itself with the feeling. Hearing the same expression from another revives the associated feeling, and we *sympathize*, i.e. grieve or are glad with him.

The other social affections, *Benevolence*, *Conscientiousness*, *Ambition*, etc., arise in like manner by the transfer of the bodily pleasure experienced as a reward for social service, and hence associated with it, to the act of service itself, the link of reward being dropped out. Just so *Avarice* when the miser transfers the bodily pleasures associated with the spending of money to the money itself, dropping the link of spending.

Fear is a transfer of the bodily hurt associated by experience with the thing feared, to the thought of the thing, with the precise features of the hurt left out. Thus we fear a dog without distinctly imagining his bite.

Love is the association of the agreeableness of certain sensible experiences with the idea of the object capable of affording them. The experiences themselves may cease to be distinctly imagined after the notion of their pleasure has been transferred to the object, constituting our love therefor.

Volition is the association of ideas of muscular motion with the ideas of those pleasures which the motion produces. The motion at first occurs automatically and results in a pleasure unforeseen. The latter becomes so associated with the motion that whenever we think of it the idea of the motion arises; and the idea of the motion when vivid causes the motion to occur. This is an act of will. [Pg 600]

Nothing is easier than for a philosopher of this school to explain from experience such a notion as that of infinitude.

"He sees in it an ordinary manifestation of one of the laws of the association of ideas,—the law that the idea of a thing irresistibly suggests the idea of any other thing which has been often experienced in close conjunction with it, and not otherwise. As we have never had experience of any point of space without other points beyond it, nor of any point of time without others following it, the law of indissoluble association makes it impossible for us to think of any point of space or time, however distant, without having the idea irresistibly realized, in imagination, of other points still more remote. And thus the supposed original and inherent property of these two ideas is completely explained and accounted for by the law of association; and we are enabled to see that if Space or Time were really susceptible of termination, we should be just as unable as we now are to conceive the idea."^[501]

These examples of the Associationist Psychology are with the exception of the last, very crudely expressed, but they suffice for our temporary need. Hartley and James Mill^[502] improved upon Hume so far as to employ but a single principle of association, that of

contiguity or habit. Hartley ignores resemblance, James Mill expressly repudiates it in a passage which is assuredly one of the curiosities of literature:

"I believe it will be found that we are accustomed to see like things together. When we see a tree, we generally see more trees than one; a sheep, more sheep than one; a man, more men than one. From this observation, I think, we may refer resemblance to the law of frequency [i.e., contiguity], of which it seems to form only a particular case."

Mr. Herbert Spencer has still more recently tried to construct a Psychology which ignores Association by Similarity,^[503] and in a chapter, which also is a curiosity, he tries to explain the association of two ideas by a conscious reference of the first to the point of time when its sensation was experienced, which point of time is no sooner thought of than its content, namely, the second idea, arises. Messrs. Bain and Mill, however, and the immense majority of contemporary psychologists retain both Resemblance and Contiguity as irreducible principles of Association.

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Professor Bain's exposition of association is by common consent looked upon as the best expression of the English school. Perception of agreement and difference, retentiveness, and the two sorts of association, contiguity and similarity, are by him regarded as constituting all that is meant by intellect proper. His pages are painstaking and instructive from a descriptive point of view; though, after my own attempt to deal with the subject causally, I can hardly award to them any profound *explanatory* value. Association by Similarity, too much neglected by the British school before Bain, receives from him the most generous exemplification. As an instructive passage, the following, out of many equally good, may be chosen to quote:

"We may have similarity in form with diversity of use, and similarity of use with diversity of form. A rope suggests other ropes and cords, if we look to the appearance; but looking to the *use*, it may suggest an iron cable, a wooden prop, an iron girding, a leather band, or bevelled gear. In spite of diversity of appearance, the suggestion turns on what answers a common end. If we are very much attracted by sensible appearances, there will be the more difficulty in recalling things that agree only in the use; if, on the other hand, we are profoundly sensitive to the one point of practical efficiency as a tool, the peculiarities not essential to this will be little noticed, and we shall be ever ready to revive past objects corresponding in use to some one present, although diverse in all other circumstances. We become oblivious to the difference between a horse, a steam-engine, and a waterfall, when our minds are engrossed with the one circumstance of moving power. The diversity in these had no doubt for a long time the effect of keeping back their first identification; and to obtuse intellects, this identification might have been for ever impossible. A strong concentration of mind upon the single peculiarity of mechanical force, and a degree of indifference to the general aspect of the things themselves, must conspire with the intellectual energy of resuscitation by similars, in order to summon together in the view three structures so different. We can see, by an instance like this, how new adaptations of existing machinery might arise in the mind of a mechanical inventor. When it first occurred to a reflecting mind that moving water had a property identical with human or brute force, namely, the property of setting other masses in motion, overcoming inertia and resistance,—when the sight of the stream suggested through this point of likeness the power of the animal,—a new addition was made to the class of prime movers, and when circumstances permitted, this power could become a substitute for the others. It may seem to the modern understanding, familiar with water-wheels and drifting rafts, that the similarity here was an extremely obvious one. But if

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we put ourselves back into an early state of mind, when running water affected the mind by its brilliancy, its roar, and irregular devastation, we may easily suppose that to identify this with animal muscular energy was by no means an obvious effect. Doubtless when a mind arose, insensible by natural constitution to the superficial aspects of things, and having withal a great stretch of identifying intellect, such a comparison would then be possible. We may pursue the same example one stage further, and come to the discovery of steam power, or the identification of expanding vapor with the previously known sources of mechanical force. To the common eye, for ages, vapor presented itself as clouds in the sky; or as a hissing noise at the spout of a kettle, with the formation of a foggy curling cloud at a few inches' distance. The forcing up of the lid of a kettle may also have been occasionally observed. But how long was it ere any one was struck with the parallelism of this appearance with a blast of wind, a rush of water, or an exertion of animal muscle? The discordance was too great to be broken through by such a faint and limited amount of likeness. In one mind, however, the identification did take place, and was followed out into its consequences. The likeness had occurred to other minds previously, but not with the same results. Such minds must have been in some way or other distinguished above the millions of mankind; and we are now endeavoring to give the explanation of their superiority. The intellectual character of Watt contained all the elements preparatory to a great stroke of similarity in such a case;—a high susceptibility, both by nature and by education, to the mechanical properties of bodies; ample previous knowledge or familiarity; and indifference to the superficial and sensational effects of things. It is not only possible, however, but exceedingly probable, that many men possessed all these accomplishments; they are of a kind not transcending common abilities. They would in some degree attach to a mechanical education almost as a matter of course. That the discovery was not sooner made supposes that something farther, and not of common occurrence, was necessary; and this additional endowment appears to be the identifying power of Similarity in general; the tendency to detect likeness in the midst of disparity and disguise. This supposition accounts for the fact, and is consistent with the known intellectual character of the inventor of the steam-engine."^[504]

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Dr. Hodgson's account of association is by all odds the best yet propounded in English.^[505] All these writers hold more or less explicitly to the notion of atomistic 'ideas' which recur. In Germany, the same mythological supposition has been more radically grasped, and carried out to a still more logical, if more repulsive, extreme, by Herbart^[506] and his followers, who until recently may be said to have reigned almost supreme in their native country.^[507] For Herbart each idea is a permanently existing entity, the entrance whereof into consciousness is but an accidental determination of its being. So far as it succeeds in occupying the theatre of consciousness, it crowds out another idea previously there. This act of inhibition gives it, however, a sort of hold on the other representation which on all later occasions facilitates its following the other into the mind. The ingenuity with which most special cases of association are formulated in this mechanical language of struggle and inhibition, is great, and surpasses in analytic thoroughness anything that has been done by the British school. This, however, is a doubtful merit, in a case where the elements dealt with are artificial; and I must confess that to my mind there is something almost hideous in the glib Herbartian jargon about *Vorstellungsmassen* and their *Hemmungen* and *Hemmungssummen*, and *senken* and *erheben* and *schweben*, and *Verschmelzungen* and *Complexionen*. Herr Lipps, the most recent systematic German Psychologist, has, I regret to say, carried out the theory of ideas in a way which the great originality, learning, and acuteness he shows make only the more

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regrettable.^[508] Such elaborately artificial constructions are, it seems to me, only a burden and a hindrance, not a help, to our science.^[509]

In French, M. Rabier in his chapter on Association,^[510] handles the subject more vigorously and acutely than any one. His treatment of it, though short, seems to me for general soundness to rank second only to Hodgson's.

In the last chapter we already invoked association to account for the effects of use in improving discrimination. In later chapters we shall see abundant proof of the immense part which it plays in other processes, and shall then readily admit that few principles of analysis, in any science, have proved more fertile than this one, however vaguely formulated it often may have been. Our own attempt to formulate it more definitely, and to escape the usual confusion between causal agencies and relations merely known, must not blind us to the immense services of those by whom the confusion was unfelt. From this practical point of view it would be a true *ignoratio elenchi* to flatter one's self that one has dealt a heavy blow at the psychology of association, when one has exploded the theory of atomistic ideas, or shown that contiguity and similarity between ideas can only be there after association is done.^[511] The whole body of the associationist psychology remains standing after you have translated 'ideas' into 'objects,' on the one hand, and 'brain-processes' on the other; and the analysis of faculties and operations is as conclusive in these terms as in those traditionally used.

[463] The theory propounded in this chapter, and a good many pages of the text, were originally published in the *Popular Science Monthly* for March, 1880.

[464] Compare Renouvier's criticism of associationism in his *Essais de Critique générale*, *Logique*, ii, p. 493 foll.

[465] Unless the name belong to a rapidly uttered sentence, when no substantive image may have time to arise.

[466] In his observations he says that time was lost in mentally taking in the word which was the cue, "owing to the quiet unobtrusive way in which I found it necessary to bring it into view, so as not to distract the thoughts. Moreover, a substantive standing by itself is usually the equivalent of too abstract an idea for us to conceive properly without delay. Thus it is very difficult to get a quick conception of the word 'carriage,' because there are so many different kinds—two-wheeled, four-wheeled, open and closed, and in so many different possible positions, that the mind possibly hesitates amidst an obscure sense of many alternations that cannot blend together. But limit the idea to say a landau, and the mental association declares itself more quickly." (*Inquiries*, etc., p. 190.)

[467] *Physiol. Psych.*, ii, 280 fol.

[468] For interesting remarks on the sorts of things associated, in these experiments, with the prompting word, see Galton, *op. cit.* pp. 185-203, and Trautscholdt in *Wundt's Psychologische Studien*, i, 213.

[469] *Mind*, xi, 64-5.

[470] This value is much smaller than that got by Wundt as above. No reason for the difference is suggested by Mr. Cattell. Wundt calls attention to the fact that the figures found by him give an average, 0.720", exactly equal to the *time interval* which in his experiments (*vide infra*, chapter on Time) was reproduced without error either way, and to that required, according to the Webers, for the legs to swing in rapid locomotion. "It is not improbable," he adds, "that this psychic constant, of the mean association-time and of the most correct appreciation of a

time-interval, may have been developed under the influence of the most usual bodily movements, which also have determined the manner in which we tend to subdivide rhythmically longer periods of time." (Physiol. Psych., ii, 286). The *rapprochement* is of that tentative sort which it is no harm for psychologists to make, provided they recollect how very fictitious and incomparable mutually all these averages derived from different observers, working under different conditions, are. Mr. Cattell's figure throws Wundt's ingenious parallel entirely out of line.—The only measurements of association-time which so far seem likely to have much theoretic importance are a few made on insane patients by Von Tschisch (Mendel's Neurologisches Centralblatt, 15 Mai, 1885, 3 Jhrg., p. 217). The simple reaction time was found about normal in three patients, one with progressive paralysis, one with inveterate mania of persecution, one recovering from ordinary mania. In the convalescent maniac and the paralytic, however, the association-time was hardly half as much as Wundt's normal figure (0.28" and 0.23" instead of 0.7"—smaller also than Cattell's), whilst in the sufferer from delusions of persecution and hallucinations it was twice as great as normal (1.39" instead of 0.7"). This latter patient's time was sixfold that of the paralytic. Herr von Tschisch remarks on the connection of the short times with diminished power for clear and consistent processes of thought, and on that of the long times with the persistent fixation of the attention upon monotonous objects (delusions). Miss Marie Walitzky (Revue Philosophique, xxviii, 583) has carried Von Tschisch's observations still farther, making 18,000 measurements in all. She found association-time increased in paralytic dementia and diminished in mania. Choice time, on the contrary, is increased in mania.

[471] Mind, xii, 67-74.

[472] Compare Bain's law of Association by Contiguity: "Actions, Sensations, and States of Feeling, occurring together or in close succession, tend to grow together, or cohere, in such a way that, when any one of them is afterwards presented to the mind, the others are apt to be brought up in idea" (Senses and Intellect, p. 327). Compare also Hartley's formulation: "Any sensations A, B, C, etc., by being associated with one another a sufficient Number of Times, get such a power over the corresponding Ideas *a, b, c, etc.*, that anyone of the sensations A, when impressed alone, shall be able to excite in the Mind *b, c, etc.*, the ideas of the rest." (Observations on Man, part i, chap. i, § 2, Prop. x.) The statement in the text differs from these in holding fast to the objective point of view. It is *things*, and objective *properties in things*, which are associated in our thought.

[473] Encyclopædia Britannica, 9th Ed., article Psychology, p. 60. col. 2.

[474] Physiol. Psych., 2d ed. ii, 300.

[475] The difficulty here as with habit *überhaupt* is in seeing how new paths come *first* to be formed (cf. above, [p. 109](#)). Experience shows that a new path *is* formed between centres for sensible impressions whenever these vibrate together or in rapid succession. A child sees a certain bottle and hears it called 'milk,' and thenceforward thinks the name when he again sees the bottle. But why the successive or simultaneous excitement of two centres independently stimulated from without, one by sight and the other by hearing, *should* result in a path between them, one does not immediately see. We can only make hypotheses. Any hypothesis of the specific mode of their formation which tallies well with the observed facts of association will be in so far forth credible, in spite of possible obscurity. Herr Münsterberg thinks (Beiträge zur exp. Psychologie, Heft i, p. 132) that between centres excited successively from without no path ought to be formed, and that consequently all contiguous association is between *simultaneous* experiences. Mr. Ward (*loc. cit.*) thinks, on the contrary, that it can only be between *successive* experiences: "The association of objects simultaneously presented can be resolved into an association of objects successively attended to.... It seems hardly possible to mention a case in which attention to the

associated objects could not have been successive. In fact, an aggregate of objects on which attention could be focussed at once would be already associated." Between these extreme possibilities, I have refrained from deciding in the text, and have described contiguous association as holding between both successively and coexistently presented objects. The physiological question as to how we may conceive the paths to originate had better be postponed till it comes to us again in the chapter on the Will, where we can treat it in a broader way. It is enough here to have called attention to it as a serious problem.

[476] Essay, bk. ii, chap. xxxiii, § 6. Compare Hume, who, like Locke, only uses the principle to account for unreasonable and obstructive mental associations:

"'Twould have been easy to have made an imaginary dissection of the brain, and have shown why, upon our conception of any idea, the animal spirits run into all the contiguous traces, and rouse up the other ideas that are related to it. But though I have neglected any advantage which I might have drawn from this topic in explaining the relations of ideas, I am afraid I must here have recourse to it, in order to account for the mistakes that arise from these relations. I shall therefore observe, that as the mind is endowed with a power of exciting any idea it pleases; whenever it dispatches the spirits into that region of the brain in which the idea is placed, these spirits always excite the idea, when they run precisely into the proper traces, and rummage that cell which belongs to the idea. But as their motion is seldom direct, and naturally turns a little to the one side or the other: for this reason the animal spirits, falling into the contiguous traces, present other related ideas in lieu of that which the mind desired at first to survey. This change we are not always sensible of; but continuing still the same train of thought, make use of the related idea which is presented to us, and employ it in our reasoning, as if it were the same with what we demanded. This is the cause of many mistakes and sophisms in philosophy; as will naturally be imagined, and as it would be easy to show, if there was occasion."

[477] *Op. cit.* prop. xi.

[478] See Chapter III, [pp. 82-5](#).

[479] I strongly advise the student to read his Senses and Intellect, pp. 544-556.

[480] Time and Space, p. 266. Compare Coleridge: "The true practical general law of association is this: that whatever makes certain parts of a total impression more vivid or distinct than the rest will determine the mind to recall these, in preference to others equally linked together by the common condition of contemporaeity or of *contiguity*. But the will itself, by confining and intensifying the attention, may arbitrarily give vividness or distinctness to any object whatsoever." (*Biographia Litteraria*, Chap. v.)

[481] *Leviathan*, pt. i, chap. iii, *init.*

[482] I refer to a recency of a few hours. Mr. Galton found that experiences from boyhood and youth were more likely to be suggested by words seen at random than experiences of later years. See his highly interesting account of experiments in his *Inquiries into Human Faculty*, pp. 191-203.

[483] For other instances see Wahle, in *Vierteljsch. f. Wiss. Phil.*, ix, 144-417 (1885).

[484] I retain the title of association by similarity in order not to depart from common usage. The reader will observe, however, that my nomenclature is not based on the same principle throughout. Impartial redintegration connotes neural processes; similarity is an objective relation perceived by the mind; ordinary or mixed association is a merely denotative word. *Total recall*, *partial recall*, and *focalized recall*, of associates, would be better terms. But as the *denotation* of the latter word is almost identical with that of association by similarity, I think it better to sacrifice propriety to popularity, and to keep the latter well-worn phrase.

- [485] No one has described this process better than Hobbes: "Sometimes a man seeks what he hath lost; and from that place and time wherein he misses it, his mind runs back from place to place and time to time to and where and when he had it; that is to say, to find some certain and limited time and place, in which to begin a method of seeking. Again, from thence his thoughts run over the same places and times to find what action or other occasion might make him lose it. This we call *Remembrance*, or calling to mind. Sometimes a man knows a place determinate, within the compass whereof he is to seek; and then his thoughts run over all the parts thereof, in the same manner as one would sweep a room to find a jewel, or as a spaniel ranges the field till he find a scent, or as a man should run over the alphabet to start a rhyme." (*Leviathan*, 165, p. 10.)
- [486] *Theory of Practice*, vol. i, p. 394.
- [487] *Ibid.* p. 394.
- [488] All association is called redintegration by Hodgson.
- [489] *Ibid.* p. 400. Compare Bain, *Emotions and Will*, p. 377. "The outgoings of the mind are necessarily random; the end alone is the thing that is clear to the view, and with that there is a perception of the fitness of every passing suggestion. The volitional energy keeps up the attention on the active search; and the moment that anything in point rises before the mind, it springs upon that like a wild beast upon its prey."
- [490] Compare what is said of the principle of Similarity by F. H. Bradley, *Principles of Logic*, pp. 294 ff.; E. Rabier, *Psychologie*, 187 ff.; Paulhan, *Critique Philosophique*, 2me Série, i, 458; Rabier, *ibid.* 460; Pillon, *ibid.* ii, 55; B. P. Bowne, *Introduction to Psych. Theory*, 92; Ward, *Encyclop. Britt. art. Psychology*, p. 60; Wahle, *Vierteljahrsch. f. wiss. Philos.*, ix, 426-431.
- [491] Dr. McCosh is accordingly only logical when he sinks similarity in what he calls the *Law of Correlation*, according to which, when we have discovered a *relation between things*, the idea of one tends to bring up the others, (*Psychology, the Cognitive Powers*, p. 130). The relations mentioned by this author are Identity, Whole and Parts, Resemblance, Space, Time, Quantity, Active Property, and Cause and Effect. If perceived relations among objects are to be treated as grounds for their appearance before the mind, similarity has of course no right to an exclusive, or even to a predominant, place.
- [492] Cf. Bain, *Senses and Intellect*, 504 ff.; J. S. Mill, Note 39 to *J. Mill's Analysis*; Lipps, *Grundtatsachen*, 97.
- [493] See, for farther details, Hamilton's Reid, Appendices D** and D***; and L. Ferri, *La Psychologie de l'Association* (Paris, 1883). Also Robertson, art. Association in *Encyclop. Britannica*.
- [494] *Treatise of Human nature*, part i., § iv.
- [495] *Observations on Man* (London, 1749).
- [496] *Analysis of the Phenomena of the Human Mind* (1829).
- [497] *Hartley's Theory*, 2d ed. (1790) p. xxvii.
- [498] [Current, that is, in France.—W. J.]
- [499] *La Psychologie Anglaise*, p. 242.
- [500] Priestley, *op. cit.* p. xxx.
- [501] Review of Bains's *Psychology*, by J.S. Mill, in *Edinb. Review*, Oct. 1, 1859, p. 293.
- [502] *Analysis of the Phenomena of the Human Mind*, J.S. Mill's edition, vol. i, p. 111.

- [503] On the Associability of Relations between Feelings, in Principles of Psychology, vol. i, p. 259. It is impossible to regard the "cohering of each feeling with previously-experienced feelings of the same class, order, genus, species, and, so far as may be, the same variety," which Spencer calls (p. 257) 'the sole process of association of feelings,' as any equivalent for what is commonly known as Association by similarity.
- [504] The Senses and the Intellect, pp. 491-3.
- [505] See his Time and Space, chapter v, and his Theory of Practice, §§ 53 to 57.
- [506] Psychologie als Wissenschaft (1824), 2.
- [507] Prof. Ribot, in chapter i of his 'Contemporary German Psychology,' has given a good account of Herbart and his school, and of Beneke, his rival and partial analogue. See also two articles on the Herbartian Psychology, by G. F. Stout, in Mind for 1888. J. D. Morrell's Outlines of Mental Philosophy (2d ed., London, 1862) largely follows Herbart and Beneke. I know of no other English book which does so.
- [508] See his Grundtatsachen des Bewusstseins (1883), chap. vi *et passim*, especially pp. 106 ff., 364.
- [509] The most burdensome and utterly gratuitous of them are perhaps Steinthal's, in his Einleitung in die Psychologie, 2te Aufl. (1881). Cf. also G. Glogau: Steinthal's Psychologische Formeln (1886).
- [510] Leçons de Philosophie, i. Psychologie, chap. xvi (1884).
- [511] Mr. F. H. Bradley seems to me to have been guilty of something very like this *ignoratio elenchi* in the, of course, subtle and witty but decidedly long-winded critique of the association of ideas, contained in book ii, part ii, chap. i, of his Principles of Logic.

CHAPTER XV.^[512]

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THE PERCEPTION OF TIME.

In the next two chapters I shall deal with what is sometimes called internal perception, or the perception of *time*, and of events as occupying a date therein, especially when the date is a past one, in which case the perception in question goes by the name of *memory*. To remember a thing as past, it is necessary that the notion of 'past' should be one of our 'ideas.' We shall see in the chapter on Memory that many things come to be thought by us as past, not because of any intrinsic quality of their own, but rather because they are associated with other things which for us signify pastness. But how do these things get *their* pastness? What is the *original* of our experience of pastness, from whence we get the meaning of the term? It is this question which the reader is invited to consider in the present chapter. We shall see that we have a constant feeling *sui generis* of pastness, to which every one of our experiences in turn falls a prey. To think a thing as past is to think it amongst the objects or in the direction of the objects which at the present moment appear affected by this quality. This is the original of our notion of past time, upon which memory and history build their systems. And in this chapter we shall consider this immediate sense of time alone.

If the constitution of consciousness were that of a string of bead-like sensations and images, all separate,

"we never could have any knowledge except that of the present instant. The moment each of our sensations ceased it would be gone for ever; and we should

be as if we had never been.... We should be wholly incapable of acquiring experience.... Even if our ideas were associated in trains, but only as they are in imagination, we should still be without the capacity of acquiring knowledge. One idea, upon this supposition, would follow another. But that would be all. Each of our successive states of consciousness, the moment it ceased, would be gone forever. Each of those momentary states would be our whole being."^[513]

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We might, nevertheless, under these circumstances, *act* in a rational way, provided the mechanism which produced our trains of images produced them in a rational order. We should make appropriate speeches, though unaware of any word except the one just on our lips; we should decide upon the right policy without ever a glimpse of the total grounds of our choice. Our consciousness would be like a glow-worm spark, illuminating the point it immediately covered, but leaving all beyond in total darkness. Whether a very highly developed practical life be possible under such conditions as these is more than doubtful; it is, however, conceivable.

I make the fanciful hypothesis merely to set off our real nature by the contrast. Our feelings are not thus contracted, and our consciousness never shrinks to the dimensions of a glow-worm spark. *The knowledge of some other part of the stream, past or future, near or remote, is always mixed in with our knowledge of the present thing.*

A simple sensation, as we shall hereafter see, is an abstraction, and all our concrete states of mind are representations of objects with some amount of complexity. Part of the complexity is the echo of the objects just past, and, in a less degree, perhaps, the foretaste of those just to arrive. Objects fade out of consciousness slowly. If the present thought is of ABCDEFG, the next one will be of BCDEFGH, and the one after that of CDEFGHI—the lingerings of the past dropping successively away, and the incomings of the future making up the loss. These lingerings of old objects, these incomings of new, are the germs of memory and expectation, the retrospective and the prospective sense of time. They give that continuity to consciousness without which it could not be called a stream."^[514]

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THE SENSIBLE PRESENT HAS DURATION.

Let any one try, I will not say to arrest, but to notice or attend to, the *present* moment of time. One of the most baffling experiences occurs. Where is it, this present? It has melted in our grasp, fled ere we could touch it, gone in the instant of becoming. As a poet, quoted by Mr. Hodgson, says,

"Le moment où je parle est déjà loin de moi,"

and it is only as entering into the living and moving organization of a much wider tract of time that the strict present is apprehended at all. It is, in fact, an altogether ideal abstraction, not only never realized in sense, but probably never even conceived of by those unaccustomed to philosophic meditation. Reflection leads us to the conclusion that it *must* exist, but that it *does* exist can never be a fact of our immediate experience. The only fact of our immediate experience is what Mr. E. R. Clay has well called 'the *specious* present.' His words deserve to be quoted in full:^[515]

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"The relation of experience to time has not been profoundly studied. Its objects are given as being of the present, but the part of time referred to by the datum is a very different thing from the conterminous of the past and future which philosophy denotes by the name Present. The present to which the datum refers is really a part of the past—a recent past—delusively given as being a time that intervenes between the past and the future. Let it be named the *specious* present, and let the past, that is given as being the past, be known as the obvious

past. All the notes of a bar of a song seem to the listener to be contained in the present. All the changes of place of a meteor seem to the beholder to be contained in the present. At the instant of the termination of such series, no part of the time measured by them seems to be a past. Time, then, considered relatively to human apprehension, consists of four parts, viz., the obvious past, the specious present, the real present, and the future. Omitting the specious present, it consists of three ... nonentities—the past, which does not exist, the future, which does not exist, and their conterminous, the present; the faculty from which it proceeds lies to us in the fiction of the specious present."

In short, the practically cognized present is no knife-edge, but a saddle-back, with a certain breadth of its own on which we sit perched, and from which we look in two directions into time. The unit of composition of our perception of time is a *duration*, with a bow and a stern, as it were—a rearward- and a forward-looking end.^[516] It is only as parts of this *duration-block* that the relation of *succession* of one end to the other is perceived. We do not first feel one end and then feel the other after it, and from the perception of the succession infer an interval of time between, but we seem to feel the interval of time as a whole, with its two ends embedded in it. The experience is from the outset a synthetic datum, not a simple one; and to sensible perception its elements are inseparable, although attention looking back may easily decompose the experience, and distinguish its beginning from its end.

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When we come to study the perception of Space, we shall find it quite analogous to time in this regard. Date in time corresponds to position in space; and although we now mentally construct large spaces by mentally imagining remoter and remoter positions, just as we now construct great durations by mentally prolonging a series of successive dates, yet the original experience of both space and time is always of something already given as a unit, inside of which attention afterward discriminates parts in relation to each other. Without the parts already given as *in* a time and *in* a space, subsequent discrimination of them could hardly do more than perceive them as *different* from each other; it would have no motive for calling the difference temporal order in this instance and spatial position in that.

And just as in certain experiences we may be conscious of an extensive space full of objects, without locating each of them distinctly therein; so, when many impressions follow in excessively rapid succession in time, although we may be distinctly aware that they occupy some duration, and are not simultaneous, we may be quite at a loss to tell which comes first and which last; or we may even invert their real order in our judgment. In complicated reaction-time experiments, where signals and motions, and clicks of the apparatus come in exceedingly rapid order, one is at first much perplexed in deciding what the order is, yet of the fact of its occupancy of time we are never in doubt.

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ACCURACY OF OUR ESTIMATE OF SHORT DURATIONS.

We must now proceed to an account of the *facts* of time-perception in detail as preliminary to our speculative conclusion. Many of the facts are matters of patient experimentation, others of common experience.

First of all, we note a marked *difference between the elementary sensations of duration and those of space*. The former have a much narrower range; the time-sense may be called a myopic organ, in comparison with the eye, for example. The eye sees rods, acres, even miles, at a single glance, and these totals it can afterward subdivide into an almost infinite number of distinctly identified parts. The units of duration, on the other hand, which the time-sense is able to take in at a single stroke, are groups of a few seconds, and within these units very few subdivisions—perhaps forty at most, as we shall presently see—can be clearly discerned. The durations we have practically most to deal with—minutes, hours, and

days—have to be symbolically conceived, and constructed by mental addition, after the fashion of those extents of hundreds of miles and upward, which in the field of space are beyond the range of most men's practical interests altogether. To 'realize' a quarter of a mile we need only look out of the window and *feel* its length by an act which, though it may in part result from organized associations, yet seems immediately performed. To realize an hour, we must count 'now!—now!—now!—now!—' indefinitely. Each 'now' is the feeling of a separate *bit* of time, and the exact sum of the bits never makes a very clear impression on our mind.

How many bits can we clearly apprehend at once? Very few if they are long bits, more if they are extremely short, most if they come to us in compound groups, each including smaller bits of its own.

Hearing is the sense by which the subdivision of durations is most sharply made. Almost all the experimental work on the time-sense has been done by means of strokes of sound. How long a series of sounds, then, can we group in the mind so as not to confound it with a longer or a shorter series?

Our spontaneous tendency is to break up any monotonously given series of sounds into some sort of a rhythm. We involuntarily accentuate every second, or third, or fourth beat, or we break the series in still more intricate ways. Whenever we thus grasp the impressions in rhythmic form, we can identify a longer string of them without confusion. [Pg 612]

Each variety of verse, for example, has its 'law'; and the recurrent stresses and sinkings make us feel with peculiar readiness the lack of a syllable or the presence of one too much. Divers verses may again be bound together in the form of a stanza, and we may then say of another stanza, "Its second verse differs by so much from that of the first stanza," when but for the felt stanza-form the two differing verses would have come to us too separately to be compared at all. But these superposed systems of rhythm soon reach their limit. In music, as Wundt^[517] says, "while the measure may easily contain 12 changes of intensity of sound (as in 12/8 time), the rhythmical group may embrace 6 measures, and the period consist of 4, exceptionally of 5 [8?] groups."

Wundt and his pupil Dietze have both tried to determine experimentally the *maximal extent of our immediate distinct consciousness for successive impressions*.

Wundt found^[518] that twelve impressions could be distinguished clearly as a united cluster, provided they were caught in a certain rhythm by the mind, and succeeded each other at intervals not smaller than 0.3 and not larger than 0.5 of a second. This makes the total time distinctly apprehended to be equal to from 3.6 to 6 seconds.

Dietze^[519] gives larger figures. The most favorable intervals for clearly catching the strokes were when they came at from 0.3 second to 0.18 second apart. *Forty* strokes might then be remembered as a whole, and identified without error when repeated, provided the mind grasped them in five sub-groups of eight, or in eight sub-groups of five strokes each. When no grouping of the strokes beyond making *couples* of them by the attention was allowed— [Pg 613] and practically it was found impossible not to group them in at least this simplest of all ways—16 was the largest number that could be clearly apprehended as a whole.^[520] This would make 40 times 0.8 second, or 12 seconds, to be the *maximum filled duration* of which we can be both *distinctly and immediately* aware.

The maximum unfilled, or *vacant duration*, seems to lie within the same objective range. Estel and Mehner, also working in Wundt's laboratory, found it to vary from 5 or 6 to 12 seconds, and perhaps more. The differences seemed due to practice rather than to idiosyncrasy.^[521]

These figures may be roughly taken to stand for the most important part of what, with Mr. Clay, we called, a few pages back, the *specious present*. The specious present has, in

addition, a vaguely vanishing backward and forward fringe; but its nucleus is probably the dozen seconds or less that have just elapsed.

If these are the maximum, what, then, is the *minimum* amount of duration which we can distinctly feel?

The smallest figure experimentally ascertained was by Exner, who distinctly heard the doubleness of two successive clicks of a Savart's wheel, and of two successive snaps of an electric spark, when their interval was made as small as about 1/500 of a second.^[522] [Pg 614]

With the eye, perception is less delicate. Two sparks, made to fall beside each other in rapid succession on the centre of the retina, ceased to be recognized as successive by Exner when their interval fell below 0.044".^[523]

Where, as here, the succeeding impressions are only two in number, we can easiest perceive the interval between them. President Hall, who experimented with a modified Savart's wheel, which gave clicks in varying number and at varying intervals, says:^[524]

"In order that their discontinuity may be clearly perceived, four or even three clicks or beats must be farther apart than two need to be. When two are easily distinguished, three or four separated by the same interval ... are often confidently pronounced to be two or three respectively. It would be well if observations were so directed as to ascertain, at least up to ten or twenty, the increase [of interval] required by each additional click in a series for the sense of discontinuity to remain constant throughout."^[525]

Where the first impression falls on one sense, and the second on another, the perception of the intervening time tends to be less certain and delicate, and it makes a difference which impression comes first. Thus, Exner found^[526] the smallest perceptible interval to be, in seconds: [Pg 615]

From sight to touch	0.071
From touch to sight	0.053
From sight to hearing	0.16
From hearing to sight	0.06
From one ear to another	0.064

To be conscious of a time interval at all is one thing; to tell whether it be shorter or longer than another interval is a different thing. A number of experimental data are on hand which give us a measure of the delicacy of this latter perception. The problem is that of the *smallest difference between two times* which we can perceive.

The difference is at its minimum when the times themselves are very short. Exner,^[527] reacting as rapidly as possible with his foot, upon a signal seen by the eye (spark), noted all the reactions which seemed to him either slow or fast in the making. He thought thus that deviations of about 1/100 of a second either way from the average were correctly noticed by him at the time. The average was here 0.1840". Hall and Jastrow listened to the intervals between the clicks of their apparatus. Between two such equal intervals of 4.27" each, a middle interval was included, which might be made either shorter or longer than the extremes. "After the series had been heard two or even three times, no impression of the relative length of the middle interval would often exist, and only after hearing the fourth and last [repetition of the series] would the judgment incline to the *plus* or *minus* side. Inserting the variable between two invariable and like intervals greatly facilitated judgment, which between two unlike terms is far less accurate."^[528] Three observers in these experiments made no error when the middle interval varied 1/60 from the extremes. When it varied 1/120, errors occurred, but were few. This would make the minimum *absolute* difference perceived as large as 0.355". [Pg 616]

This minimum absolute difference, of course, increases as the times compared grow long. Attempts have been made to ascertain what *ratio* it bears to the times themselves. According to Fechner's 'Psychophysic Law' it ought always to bear the same ratio. Various observers, however, have found this not to be the case.^[529] On the contrary, very interesting *oscillations* in the accuracy of judgment and in the direction of the error—oscillations dependent upon the absolute amount of the times compared—have been noticed by all who have experimented with the question. Of these a brief account may be given.

In the first place, *in every list of intervals experimented with there will be found what Vierordt calls an 'INDIFFERENCE-POINT;'* that is to say, an interval which we judge with maximum accuracy, a time which we tend to estimate as neither longer or shorter than it really is, and away from which, in both directions, errors increase their size.^[530] This time varies from one observer to another, but its average is remarkably constant, as the following table shows.^[531]

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The times, noted by the ear, and the average indifference-points (given in seconds) were, for

Wundt ^[532]	0.72
Kollert ^[533]	0.75
Estel (probably)	0.75
Mehner	0.71
Stevens ^[534]	0.71
Mach ^[535]	0.35
Buccola (about) ^[536]	0.40

The odd thing about these figures is the recurrence they show in so many men of about three fourths of a second, as the interval of time most easy to catch and reproduce, Odder still, both Estel and Mehner found that *multiples* of this time were more accurately reproduced than the time-intervals of intermediary length,^[537] and Glass found a certain periodicity, with the constant increment of 1.25 sec., in his observations. There would seem thus to exist something like a periodic or rhythmic sharpening of our time-sense, of which the period differs somewhat from one observer to the next.

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Our sense of time, like other senses, *seems subject to the law of contrast*. It appeared pretty plainly in Estel's observations that an interval sounded shorter if a long one had immediately preceded it, and longer when the opposite was the case.

Like other senses, too, *our sense of time is sharpened by practice*. Mehner ascribes almost all the discrepancies between other observers and himself to this cause alone.^[538]

Tracts of time filled (with clicks of sound) *seem longer than vacant ones* of the same duration, when the latter does not exceed a second or two.^[539] This, which reminds one of what happens with spaces seen by the eye, becomes reversed when longer times are taken. It is, perhaps, in accordance with this law that a *loud* sound, limiting a short interval of time, makes it appear longer, a *slight* sound shorter. In comparing intervals marked out by sounds, we must take care to keep the sounds uniform.^[540]

There is a certain emotional *feeling* accompanying the intervals of time, as is well known in music. *The sense of haste goes with one measure of rapidity, that of delay with another;* and these two feelings harmonize with different mental moods. Vierordt listened to series of strokes performed by a metronome at rates varying from 40 to 200 a minute, and found that

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they very naturally fell into seven categories, from 'very slow' to 'very fast.'^[541] Each category of feeling included the intervals following each other within a certain range of speed, and no others. This is a qualitative, not a quantitative judgment—an æsthetic judgment, in fact. The middle category, of speed that was neutral, or, as he calls it, 'adequate,' contained intervals that were grouped about 0.62 second, and Vierordt says that this made what one might almost call an *agreeable* time.^[542]

The feeling of time and accent in music, of rhythm, is quite independent of that of melody. Tunes with marked rhythm can be readily recognized when simply drummed on the table with the finger-tips.

WE HAVE NO SENSE FOR EMPTY TIME.

Although subdividing the time by beats of sensation aids our accurate knowledge of the amount of it that elapses, such subdivision does not seem at the first glance essential to our perception of its flow. Let one sit with closed eyes and, abstracting entirely from the outer world, attend exclusively to the passage of time, like one who wakes, as the poet says, "to hear time flowing in the middle of the night, and all things moving to a day of doom." There seems under such circumstances as these no variety in the material content of our thought, and what we notice appears, if anything, to be the pure series of durations budding, as it were, and growing beneath our indrawn gaze. Is this really so or not? The question is important, for, if the experience be what it roughly seems, we have a sort of special sense for pure time—a sense to which empty duration is an adequate stimulus; while if it be an illusion, it must be that our perception of time's flight, in the experiences quoted, is due to the *filling* of the time, and to our *memory* of a content which it had a moment previous, and which we feel to agree or disagree with its content now.

It takes but a small exertion of introspection to show that the latter alternative is the true one, and that *we can no more intuit a duration than we can intuit an extension, devoid of all sensible content*. Just as with closed eyes we perceive a dark visual field in which a curdling play of obscurest luminosity is always going on; so, be we never so abstracted from distinct outward impressions, we are always inwardly immersed in what Wundt has somewhere called the twilight of our general consciousness. Our heart-beats, our breathing, the pulses of our attention, fragments of words or sentences that pass through our imagination, are what people this dim habitat. Now, all these processes are rhythmical, and are apprehended by us, as they occur, in their totality; the breathing and pulses of attention, as coherent successions, each with its rise and fall; the heart-beats similarly, only relatively far more brief; the words not separately, but in connected groups. In short, empty our minds as we may, some form of *changing process* remains for us to feel, and cannot be expelled. And along with the sense of the process and its rhythm goes the sense of the length of time it lasts. Awareness of *change* is thus the condition on which our perception of time's flow depends; but there exists no reason to suppose that empty time's own changes are sufficient for the awareness of change to be aroused. The change must be of some concrete sort—an outward or inward sensible series, or a process of attention or volition.^[543]

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And here again we have an analogy with space. The earliest form of distinct space-perception is undoubtedly that of a movement over some one of our sensitive surfaces, and this movement is originally given as a simple whole of feeling, and is only decomposed into its elements—successive positions successively occupied by the moving body—when our education in discrimination is much advanced. But a movement is a change, a process; so we see that in the time-world and the space-world alike the first known things are not elements, but combinations, not separate units, but wholes already formed. The condition of *being* of the wholes may be the elements; but the condition of our *knowing* the elements is our having already felt the wholes as wholes.

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In the experience of watching empty time flow—'empty' to be taken hereafter in the relative sense just set forth—we tell it off in pulses. We say 'now! now! now!' or we count 'more! more! more!' as we feel it bud. This composition out of units of duration is called the law of time's *discrete flow*. The discreteness is, however, merely due to the fact that our successive acts of *recognition* or *apperception* of *what* it is are discrete. The sensation is as continuous as any sensation can be. All continuous sensations are *named* in beats. We notice that a certain finite 'more' of them is passing or already past. To adopt Hodgson's image, the sensation is the measuring-tape, the perception the dividing-engine which stamps its length. As we listen to a steady sound, we *take it in* in discrete pulses of recognition, calling it successively 'the same! the same! the same!' The case stands no otherwise with time.

After a small number of beats our impression of the amount we have told off becomes quite vague. Our only way of knowing it accurately is by counting, or noticing the clock, or through some other symbolic conception.^[544] When the times exceed hours or days, the conception is absolutely symbolic. We think of the amount we mean either solely as a *name*, or by running over a few salient *dates* therein, with no pretence of imagining the full durations that lie between them. No one has anything like a *perception* of the greater length of the time between now and the first century than of that between now and the tenth. To an historian, it is true, the longer interval will suggest a host of additional dates and events, and so appear a more *multitudinous* thing. And for the same reason most people will think they directly perceive the length of the past fortnight to exceed that of the past week. But there is properly no comparative time *intuition* in these cases at all. It is but dates and events. *representing* time; their abundance *symbolizing* its length. I am sure that this is so, even where the times compared are no more than an hour or so in length. It is the same with Spaces of many miles, which we always compare with each other by the numbers which measure them.^[545]

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From this we pass naturally to speak of certain familial variations in our estimation of lengths of time. *In general, a time filled with varied and interesting experiences seems short in passing, but long as we look back. On the other hand, a tract of time empty of experiences seems long in passing, but in retrospect short.* A week of travel and sight-seeing may subtend an angle more like three weeks in the memory; and a month of sickness hardly yields more memories than a day. The length in retrospect depends obviously on the multitudinousness of the memories which the time affords. Many objects, events, changes, many subdivisions, immediately widen the view as we look back. Emptiness, monotony, familiarity, make it shrivel up. In Von Holtei's 'Vagabonds' one Anton is described as revisiting his native village.

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"Seven years," he exclaims, "seven years since I ran away! More like seventy it seems, so much has happened. I cannot think of it all without becoming dizzy—at any rate not now. And yet again, when I look at the village, at the church-tower, it seems as if I could hardly have been seven days away."

Prof. Lazarus^[546] (from whom I borrow this quotation), thus explains both of these contrasted illusions by our principle of the awakened memories being multitudinous or few:

"The circle of experiences, widely extended, rich in variety, which he had in view on the day of his leaving the village rises now in his mind as its image lies before him. And with it—in rapid succession and violent motion, not in chronologic order, or from chronologic motives, but suggesting each other by all sorts of connections—arise massive images of all his rich vagabondage and roving life. They roll and wave confusedly together, first perhaps one from the first year, then from the sixth, soon from the second, again from the fifth, the first, etc., until it seems as if seventy years must have been there, and he reels with the fulness of his vision.... Then the inner eye turns away from all this

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past. The outer one turns to the village, especially to the church-tower. The sight of it calls back the old sight of it, so that the consciousness is filled with that alone, or almost alone. The one vision compares itself with the other, and looks so near, so unchanged, that it seems as if only a week of time could have come between."

The same space of time seems shorter as we grow older—that is, the days, the months, and the years do so; whether the hours do so is doubtful, and the minutes and seconds to all appearance remain about the same.

"Whoever counts many lustra in his memory need only question himself to find that the last of these, the past five years, have sped much more quickly than the preceding periods of equal amount. Let any one remember his last eight or ten school years: it is the space of a century. Compare with them the last eight or ten years of life: it is the space of an hour."

So writes Prof. Paul Janet,^[547] and gives a solution which can hardly be said to diminish the mystery. There is a law, he says, by which the apparent length of an interval at a given epoch of a man's life is proportional to the total length of the life itself. A child of 10 feels a year as 1/10 of his whole life—a man of 50 as 1/50, the whole life meanwhile apparently preserving a constant length. This formula roughly expresses the phenomena, it is true, but cannot possibly be an elementary psychic law; and it is certain that, in great part at least, the foreshortening of the years as we grow older is due to the monotony of memory's content, and the consequent simplification of the backward-glancing view. In youth we may have an absolutely new experience, subjective or objective, every hour of the day. Apprehension is vivid, retentiveness strong, and our recollections of that time, like those of a time spent in rapid and interesting travel, are of something intricate, multitudinous, and long-drawn-out. But as each passing year converts some of this experience into automatic routine which we hardly note at all, the days and the weeks smooth themselves out in recollection to contentless units, and the years grow hollow and collapse.

So much for the apparent shortening of tracts of time in *retrospect*. They shorten *in passing* [Pg 626] whenever we are so fully occupied with their content as not to note the actual time itself. A day full of excitement, with no pause, is said to pass 'ere we know it.' On the contrary, a day full of waiting, of unsatisfied desire for change, will seem a small eternity. *Tædium, ennui, Langweile, boredom*, are words for which, probably, every language known to man has its equivalent. It comes about whenever, from the relative emptiness of content of a tract of time, we grow attentive to the passage of the time itself. Expecting, and being ready for, a new impression to succeed; when it fails to come, we get an empty time instead of it; and such experiences, ceaselessly renewed, make us most formidably aware of the extent of the mere time itself.^[548] Close your eyes and simply wait to hear somebody tell you that a minute has elapsed. The full length of your leisure with it seems incredible. You engulf yourself into its bowels as into those of that interminable first week of an ocean voyage, and find yourself wondering that history can have overcome many such periods in its course. All because you attend so closely to the mere feeling of the time *per se*, and because your attention to that is susceptible of such fine-grained successive subdivision. The *odiousness* of the whole experience comes from its insipidity; for *stimulation* is the indispensable requisite for pleasure in an experience, and the feeling of bare time is the least stimulating experience we can have.^[549] The sensation of *tædium* is a *protest*, says Volkmann, against the entire present.

Exactly parallel variations occur in our consciousness of space. A road we walk back over, hoping to find at each step an object we have dropped, seems to us longer than when we walked over it the other way. A space we measure by pacing appears longer than one we traverse with no thought of its length. And in general an amount of space attended to in [Pg 627]

itself leaves with us more impression of spaciousness than one of which we only note the content.^[550]

I do not say that *everything* in these fluctuations of estimate can be accounted for by the time's content being crowded and interesting, or simple and tame. Both in the shortening of time by old age and in its lengthening by *ennui* some deeper cause *may* be at work. This cause can only be ascertained, if it exist, by finding out *why we perceive time at all*. To this inquiry let us, though without much hope, proceed.

THE FEELING OF PAST TIME IS A PRESENT FEELING.

If asked why we perceive the light of the sun, or the sound of an explosion, we reply, "Because certain outer forces, ether-waves or air-waves, smite upon the brain, awakening therein changes, to which the conscious perceptions, light and sound, respond." But we hasten to add that neither light nor sound *copy* or *mirror* the ether- or air-waves; they represent them only symbolically. The *only* case, says Helmholtz, in which such copying occurs, and in which

"our perceptions can truly correspond with outer reality, is that of the *tune-succession* of phenomena. Simultaneity, succession, and the regular return of simultaneity or succession, can obtain as well in sensations as in outer events. Events, like our perceptions of them, take place in time, so that the time-relations of the latter can furnish a true copy of those of the former. The sensation of the thunder follows the sensation of the lightning just as the sonorous convulsing of the air by the electric discharge reaches the observer's place later than that of the luminiferous ether."^[551]

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One experiences an almost instinctive impulse, in pursuing such reflections as these, to follow them to a sort of crude speculative conclusion, and to think that he has at last got the mystery of cognition where, to use a vulgar phrase, 'the wool is short.' What more natural, we say, than that the sequences and durations of things *should* become known? The succession of the outer forces stamps itself as a like succession upon the brain. The brain's successive changes are copied exactly by correspondingly successive pulses of the mental stream. The mental stream, feeling itself, must feel the time-relations of its own states. But as these are copies of the outward time-relations, so must it know them too. That is to say, these latter time-relations arouse their own cognition; or, in other words, the mere existence of time in those changes out of the mind which affect the mind is a sufficient cause why time is perceived by the mind.

This philosophy is unfortunately too crude. Even though we *were* to conceive the outer successions as forces stamping their image on the brain, and the brain's successions as forces stamping their image on the mind,^[552] still, between the mind's own changes *being* successive, and *knowing their own succession*, lies as broad a chasm as between the object and subject of any case of cognition in the world. *A succession of feelings, in and of itself, is not a feeling of succession. And since, to our successive feelings, a feeling of their own succession is added, that must be treated as an additional fact requiring its own special elucidation*, which this talk about outer time-relations stamping copies of themselves within, leaves all untouched.

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I have shown, at the outset of the article, that what is past, to be known as past, must be known *with* what is present, and *during* the 'present' spot of time. As the clear understanding of this point has some importance, let me, at the risk of repetition, recur to it again. Volkman has expressed the matter admirably, as follows:

"One might be tempted to answer the question of the origin of the time-idea by simply pointing to the train of ideas, whose various members, starting from the first, successively attain to full clearness. But against this it must be objected that the successive ideas are not yet the idea of succession, because succession *in* thought is not the thought *of* succession. If idea A follows idea B, consciousness simply exchanges one for another. That B *comes after* A is for our consciousness a non-existent fact; for this *after* is given neither in B nor in A; and no third idea has been supposed. The thinking of the sequence of B upon A is another kind of thinking from that which brought forth A and then brought forth B; and this first kind of thinking is absent so long as merely the thinking of A and the thinking of B are there. In short, when we look at the matter sharply, we come to this antithesis, that if A and B are to be represented *as occurring in succession* they must be *simultaneously represented*; if we are to think *of* them as one after the other, we must *think* them both at once."^[553]

If we represent the actual time-stream of our thinking by an horizontal line, the thought *of* the stream or of any segment of its length, past, present, or to come, might be figured in a perpendicular raised upon the horizontal at a certain point. The length of this perpendicular stands for a certain object or content, which in this case is the time thought of, and all of which is thought of together at the actual moment of the stream upon which the perpendicular is raised. Mr. James Ward puts the matter very well in his masterly article 'Psychology' in the ninth edition of the Encyclopædia Britannica, page 64. He says:

"We may, if we represent succession as a line, represent simultaneity as a second line at right angles to the first; empty time—or time-length without time-breadth, we may say—is a mere abstraction. Now, it is with the former line that we have to do in treating of time as it is, and with the latter in treating of our intuition of time, where, just as in a perspective representation of distance, we are confined to lines in a plane at right angles to the actual line of depth. In a succession of events, say of sense-impressions, A B C D E..., the presence of B means the absence of A and C, but the presentation of this succession involves the simultaneous presence in some mode or other of two or more of the presentations A B C D. In reality, past, present, and future are differences in time, but in presentation all that corresponds to these differences is in consciousness simultaneously."

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There is thus a sort of *perspective projection* of past objects upon present consciousness, similar to that of wide landscapes upon a camera-screen.

And since we saw a while ago that our maximum distinct *intuition* of duration hardly covers more than a dozen seconds (while our maximum vague intuition is probably not more than that of a minute or so), we must suppose that *this amount of duration is pictured fairly steadily in each passing instant of consciousness* by virtue of some fairly constant feature in the brain-process to which the consciousness is tied. *This feature of the brain-process, whatever it be, must be the cause of our perceiving the fact of time at all.*^[554] The duration thus steadily perceived is hardly more than the 'specious present,' as it was called a few pages back. Its *content* is in a constant flux, events dawning into its forward end as fast as they fade out of its rearward one, and each of them changing its time-coefficient from 'not yet,' or 'not quite yet,' to 'just gone' or 'gone,' as it passes by. Meanwhile, the specious present, the intuited duration, stands permanent, like the rainbow on the waterfall, with its own quality unchanged by the events that stream through it. Each of these, as it slips out, retains the power of being reproduced; and when reproduced, is reproduced with the duration and neighbors which it originally had. Please observe, however, that the reproduction of an event, *after* it has once completely dropped out of the rearward end of the

specious present, is an entirely different psychic fact from its direct perception in the specious present as a thing immediately past. A creature might be entirely devoid of *reproductive* memory, and yet have the time-sense; but the latter would be limited, in his case, to the few seconds immediately passing by. Time older than that he would never recall. I assume reproduction in the text, because I am speaking of human beings who notoriously possess it. Thus memory gets strewn with *dated* things—dated in the sense of being before or after each other.^[555] The date of a thing is a mere relation of *before* or *after* the present thing or some past or future thing. Some things we date simply by mentally tossing them into the past or future *direction*. So in space we think of England as simply to the eastward, of Charleston as lying south. But, again, we may date an event exactly, by fitting it between two terms of a past or future series explicitly conceived, just as we may accurately think of England or Charleston being just so many miles away.^[556]

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The things and events thus vaguely or exactly dated become thenceforward those signs and symbols of longer time-spaces, of which we previously spoke. According as we think of a multitude of them, or of few, so we imagine the time they represent to be long or short. But *the original paragon and prototype of all conceived times is the specious present, the short duration of which we are immediately and incessantly sensible.*

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TO WHAT CEREBRAL PROCESS IS THE SENSE OF TIME DUE?

Now, to what element in the brain-process may this sensibility be due? It cannot, as we have seen, be due to the mere duration itself of the process; it must be due to an element present at every moment of the process, and this element must bear the same inscrutable *sort* of relation to its correlative feeling which all other elements of neural activity bear to their psychic products, be the latter what they may. Several suggestions have been made as to what the element is in the case of time. Treating of them in a note,^[557] I will try to express briefly the only conclusion which seems to emerge from a study of them and of the facts—unripe though that conclusion be.

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The phenomena of 'summation of stimuli' in the nervous system prove that each stimulus leaves some latent activity behind it which only gradually passes away. (See above, [pp. 82-85](#).) Psychological proof of the same fact is afforded by those 'after-images' which we perceive when a sensorial stimulus is gone. We may read off peculiarities in an after-image, left by an object on the eye, which we failed to note in the original. We may 'hark back' and take in the meaning of a sound several seconds after it has ceased. Delay for a minute, however, and the echo itself of the clock or the question is mute; present sensations have banished it beyond recall. With the feeling of the present thing there must at all times mingle the fading echo of all those other things which the previous few seconds have supplied. Or, to state it in neural terms, *there is at every moment a cumulation of brain-processes overlapping each other, of which the fainter ones are the dying phases of processes which but shortly previous were active in a maximal degree. The AMOUNT OF THE OVERLAPPING determines the feeling of the DURATION OCCUPIED. WHAT EVENTS shall appear to occupy the duration depends on just WHAT PROCESSES the overlapping processes are.* We know so little of the intimate nature of the brain's activity that even where a sensation monotonously endures, we cannot say that the earlier moments of it do not leave fading processes behind which coexist with those of the present moment. *Duration and events together form our intuition of the specious present with its content.*^[558] Why such an intuition should result from such a combination of brain-processes I do not pretend to say. All I aim at is to state the most *elemental* form of the psycho-physical conjunction.

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I have assumed that the brain-processes are sensational ones. Processes of active attention (see Mr. Ward's account in [Footnote 556](#)) will leave similar fading brain-processes behind. If the mental processes are conceptual, a complication is introduced of which I will in a

moment speak. Meanwhile, still speaking of sensational processes, a remark of Wundt's will throw additional light on the account I give. As is known, Wundt and others have proved that every act of perception of a sensorial stimulus takes an appreciable time. When two different stimuli—e.g. a sight and a sound—are given at once or nearly at once, we have difficulty in attending to both, and may wrongly judge their interval, or even invert their order. Now, as the result of his experiments on such stimuli. Wundt lays down this law:^[559] that of the three possible determinations we may make of their order—

"namely, simultaneity, continuous transition, and discontinuous transition—only the first and last are realized, *never the second*. Invariably, when we fail to perceive the impressions as simultaneous, we notice a shorter or longer empty time between them, *which seems to correspond to the sinking of one of the ideas and to the rise of the other....* For our attention may share itself equally between the two impressions, which will then compose one total percept [and be simultaneously felt]; or it may be so adapted to one event as to cause it to be perceived immediately, and then the second event can be perceived only after a certain time of latency, during which the attention reaches its effective maximum for it and diminishes for the first event. In this case the events are perceived as *two*, and in successive order—that is, as separated by a time-interval in which attention is not sufficiently accommodated to either to bring a distinct perception about.... While we are hurrying from one to the other, everything between them vanishes in the twilight of general consciousness."^[560]

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One might call this the *law of discontinuous succession in time, of percepts to which we cannot easily attend at once*. Each percept then requires a separate brain-process; and when one brain-process is at its maximum, the other would appear perforce to be in either a waning or a waxing phase. If our theory of the time-feeling be true, empty time *must* then subjectively appear to separate the two percepts, no matter how close together they may objectively be; for, according to that theory, the feeling of a time-duration is the immediate effect of such an overlapping of brain-processes of different phase—wherever and from whatever cause it may occur.

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To pass, now, to conceptual processes: Suppose I think of the Creation, then of the Christian era, then of the battle of Waterloo, all within a few seconds. These matters have their dates far outside the specious present. The processes by which I think them, however, all overlap. What events, then, does the specious present seem to contain? Simply my successive *acts of thinking* these long-past things, not the long-past things themselves. As the instantly-present thought may be of a long-past thing, so the just-past thought may be of another long-past thing. When a long-past event is reproduced in memory and conceived with its date, the reproduction and conceiving traverse the specious present. The immediate content of the latter is thus all my *direct experiences*, whether subjective or objective. Some of these meanwhile may be *representative* of other experiences indefinitely remote.

The number of these direct experiences which the specious present and immediately-intuited past may embrace measures the extent of our 'primary,' as Exner calls it, or, as Richet calls it, of our 'elementary' memory.^[561] The sensation resultant from the overlapping is that of the duration which the experiences seem to fill. As is the number of any larger set of events to that of these experiences, so we suppose is the length of that duration to this duration. But of the longer duration we have no direct 'realizing sense.' The variations in our appreciation of the same amount of real time may possibly be explained by alterations in the rate of fading in the images, producing changes in the complication of superposed processes, to which changes changed states of consciousness may correspond. But however *long we may conceive* a space of time to be, the objective amount of it which is *directly perceived* at any

one moment by us can never exceed the scope of our 'primary memory' at the moment in question.^[562]

We have every reason to think that creatures may possibly differ enormously in the amounts of duration which they intuitively feel, and in the fineness of the events that may fill it. Von Bær has indulged^[563] in some interesting computations of the effect of such differences in changing the aspect of Nature. Suppose we were able, within the length of a second, to note 10,000 events distinctly, instead of barely 10, as now; if our life were then destined to hold the same number of impressions, it might be 1000 times as short. We should live less than a month, and personally know nothing of the change of seasons. If born in winter, we should believe in summer as we now believe in the heats of the Carboniferous era. The motions of organic beings would be so slow to our senses as to be inferred, not seen. The sun would stand still in the sky, the moon be almost free from change, and so on. But now reverse the hypothesis and suppose a being to get only one 1000th part of the sensations that we get in a given time, and consequently to live 1000 times as long. Winters and summers will be to him like quarters of an hour. Mushrooms and the swifter-growing plants will shoot into being so rapidly as to appear instantaneous creations; annual shrubs will rise and fall from the earth like restlessly boiling-water springs; the motions of animals will be as invisible as are to us the movements of bullets and cannon-balls; the sun will scour through the sky like a meteor, leaving a fiery trail behind him, etc. That such imaginary cases (barring the superhuman longevity) may be realized somewhere in the animal kingdom, it would be rash to deny.

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"A gnat's wings," says Mr Spencer,^[564] "make ten or fifteen thousand strokes a second. Each stroke implies a separate nervous action. Each such nervous action or change in a nervous centre is probably as appreciable by the gnat as is a quick movement of his arm by a man. And if this, or anything like this, is the fact, then the time occupied by a given external change, measured by many movements in the one case, must seem much longer than in the other case, when measured by one movement."

In hashish-intoxication there is a curious increase in the apparent time-perspective. We utter a sentence, and ere the end is reached the beginning seems already to date from indefinitely long ago. We enter a short street, and it is as if we should never get to the end of it. This alteration might conceivably result from an approach to the condition of Von Bær's and Spencer's short-lived beings. If our discrimination of successions became finer-grained, so that we noted ten stages in a process where previously we only noted one; and if at the same time the processes faded ten times as fast as before; we might have a specious present of the same subjective length as now, giving us the same time-feeling and containing as many distinguishable successive events, but out from the earlier end of it would have dropped nine tenths of the real events it now contains. They would have fallen into the general reservoir of merely dated memories, reproducible at will. The beginning of our sentences would have to be expressly recalled; each word would appear to pass through consciousness at a tenth of its usual speed. The condition would, in short, be exactly analogous to the enlargement of space by a microscope; fewer real things at once in the immediate field of view, but each of them taking up more than its normal room, and making the excluded ones seem unnaturally far away.

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Under other conditions, processes seem to fade rapidly without the compensating increase in the subdivisibility of successions. Here the apparent length of the specious present contracts. Consciousness dwindles to a point, and loses all intuitive sense of the whence and whither of its path. Express acts of memory replace rapid bird's-eye views. In my own case, something like this occurs in extreme fatigue. Long illnesses produce it. Occasionally, it appears to accompany aphasia.^[565] It would be vain to seek to imagine the exact brain-

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change in any of these cases. But we must admit the possibility that to some extent the variations of time-estimate between youth and age, and excitement and *ennui*, are due to such causes, more immediate than to the one we assigned some time ago.

But whether our feeling of the time which immediately-past^[566] events have filled be of something long or of something short, it is not what it is because those events are past, but because they have left behind them processes which are present. To those processes, however caused, the mind would still respond by feeling a specious present, with one part of it just vanishing or vanished into the past. As the Creator is supposed to have made Adam with a navel—sign of a birth which never occurred—so He might instantaneously make a man with a brain in which were processes just like the 'fading' ones of an ordinary brain. The first real stimulus after creation would set up a process additional to these. The processes would overlap; and the new-created man would unquestionably have the feeling, at the very primal instant of his life, of having been in existence already some little space of time.

Let me sum up, now, by saying that we are constantly conscious of a certain duration—the specious present—varying in length from a few seconds to probably not more than a minute, and that this duration (with its content perceived as having one part earlier and the other part later) is the original intuition of time. Longer times are conceived by adding, shorter ones by dividing, portions of this vaguely bounded unit, and are habitually thought by us symbolically. Kant's notion of an *intuition* of objective time as an infinite necessary continuum has nothing to support it. The *cause* of the intuition which we really have cannot be the *duration* of our brain-processes or our mental changes. That duration is rather the *object* of the intuition which, being realized at every moment of such duration, must be due to a permanently present cause. This cause—probably the simultaneous presence of brain-processes of different phase—fluctuates; and hence a certain range of variation in the amount of the intuition, and in its subdivisibility, accrues.

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[512] This chapter is reprinted almost verbatim from the *Journal of Speculative Philosophy*, vol. xx, p. 374.

[513] James Mill, *Analysis*, vol. x, p. 319 (J. S. Mill's edition).

[514] "What I find, when I look at consciousness at all, is, that what I cannot divest myself of, or not have in consciousness, if I have consciousness at all, is a sequence of different feelings.... The simultaneous perception of both sub-feelings, whether as parts of a coexistence or of a sequence, is the total feeling—the minimum of consciousness—and this minimum has duration.... Time-duration, however, is inseparable from the minimum, notwithstanding that, in an isolated moment, we could not tell which part of it came first, which last.... We do not require to know that the sub-feelings come in sequence, first one, then the other; nor to know what coming in sequence means. But we have, in any artificially isolated minimum of consciousness, the *rudiments* of the perception of former and latter in time, in the sub-feeling that grows fainter, and the sub-feeling that grows stronger, and the change between them....

"In the next place, I remark that the rudiments of memory are involved in the minimum of consciousness. The first beginnings of it appear in that minimum, just as the first beginnings of perception do. As each member of the change or difference which goes to compose that minimum is the rudiment of a single perception, so the priority of one member to the other, although both are given to consciousness in one empirical present moment, is the rudiment of memory. The fact that the minimum of consciousness is difference or change in feelings, is the ultimate explanation of memory as well as of single perceptions. A former and a

latter are included in the minimum of consciousness; and this is what is meant by saying that all consciousness is in the form of *time*, or that time is the form of feeling, the form of sensibility. Crudely and popularly we divide the course of time into past, present, and future; but, strictly speaking, there is no present; it is composed of past and future divided by an indivisible point or instant. That instant, or time-point, is the strict *present*. What we call, loosely, the present, is an empirical portion of the course of time, containing at least a minimum of consciousness, in which the instant of change is the present time-point.... If we take this as the present time-point, it is clear that the minimum of feeling contains two portions—a sub-feeling that goes and a sub-feeling that comes. One is remembered, the other imagined. The limits of both are indefinite at beginning and end of the minimum, and ready to melt into other minima, proceeding from other stimuli.

"Time and consciousness do not come to us ready marked out into minima; we have to do that by reflection, asking ourselves, What is the least empirical moment of consciousness? That least empirical moment is what we usually call the present moment; and even this is too minute for ordinary use; the present moment is often extended practically to a few seconds, or even minutes, beyond which we specify what length of time we mean, as the present hour, or day, or year, or century.

"But this popular way of thinking imposes itself on great numbers even of philosophically-minded people, and they talk about the *present* as if it was a *datum*—as if time came to us marked into present periods like a measuring-tape." (S. H. Hodgson: *Philosophy of Reflection*, vol. i, pp. 248-254.)

"The representation of time agrees with that of space in that a certain amount of it must be presented together—included between its initial and terminal limit. A continuous ideation, flowing from one point to another, would indeed *occupy* time, but not *represent* it, for it would exchange one element of succession for another instead of grasping the whole succession at once. Both points—the beginning and the end—are equally essential to the conception of time, and must be present with equal clearness together." (Herbart: *Psychol. als W.*, § 115.)

"Assume that ... similar pendulum-strokes follow each other at regular intervals in a consciousness otherwise void. When the first one is over, an image of it remains in the fancy until the second succeeds. This, then, reproduces the first by virtue of the law of association by similarity, but at the same time meets with the aforesaid persisting image.... Thus does the simple repetition of the sound provide all the elements of time-perception. The first sound [as it is recalled by association] gives the beginning, the second the end, and the persistent image in the fancy represents the length of the interval. At the moment of the second impression, the entire time-perception exists at once, for then all its elements are presented together, the second sound and the image in the fancy immediately, and the first impression by reproduction. But, in the same act, we are aware of a state in which only the first sound existed, and of another in which only its image existed in the fancy. Such a consciousness as this *is* that of time.... *In it no succession of ideas takes place.*" (Wundt: *Physiol. Psych.*, 1st ed. pp. 681-2.) Note here the assumption that the *persistence* and the *reproduction* of an impression are two processes which may go on simultaneously. Also that Wundt's description is merely an *attempt to analyze the 'deliverance'* of a time-perception, and no *explanation of the manner in which it comes about*.

[515] The Alternative, p. 167.

[516] Locke, in his dim way, derived the sense of duration from reflection on the succession of our ideas (Essay, book ii, chap. xiv, § 3; chap. xv, § 12). Reid justly remarks that if ten successive elements are to make duration, "then one must make duration, otherwise duration must be made up of parts that have no duration, which is impossible.... I conclude, therefore, that there must be duration

in every single interval or element of which the whole duration is made up. Nothing, indeed, is more certain than that every elementary part of extension must have extension. Now, it must be observed that in these elements of duration, or single intervals of successive ideas, there is no succession of ideas, yet we must conceive them to have duration; whence we may conclude with certainty that *there is a conception of duration where there is no succession of ideas in the mind.*" (Intellectual Powers, essay iii, chap. v.) "Qu'on ne cherche point," says Royer-Collard in the Fragments added to Jouffroy's Translation of Reid, "la durée dans la succession; on ne l'y trouvera jamais; la durée a précédé la succession; la notion de la durée a précédé la notion de la succession. Elle en est donc tout-à-fait indépendante, dira-t-on? Oui, elle en est tout-à-fait indépendante."

- [517] Physiol. Psych., ii, 54, 55.
- [518] *Ibid.* ii, 213.
- [519] Philosophische Studien, ii, 362.
- [520] *Counting* was of course not permitted. It would have given a symbolic concept and no intuitive or immediate perception of the totality of the series. With counting we may of course compare together series of any length—series whose beginnings have faded from our mind, and of whose totality we retain no sensible impression at all. To count a series of clicks is an altogether different thing from merely perceiving them as discontinuous. In the latter case we need only be conscious of the bits of empty duration between them; in the former we must perform rapid acts of association between them and as many names of numbers.
- [521] Estel in Wundt's Philosophische Studien, ii, 50. Mehner, *ibid.* ii, 571. In Dietze's experiments even numbers of strokes were better caught than odd ones, by the ear. The *rapidity of their sequence* had a great influence on the result. At more than 4 seconds apart it was impossible to perceive series of them as units in all (cf. Wundt, Physiol. Psych., ii, 214). They were simply counted as so many individual strokes. Below 0.21 to 0.11 second, according to the observer, judgment again became confused. It was found that the rate of succession most favorable for grasping long series was when the strokes were sounded at intervals of from 0.3" to 0.18' apart. Series of 4, 6, 8, 16 were more easily identified than series of 10, 12, 14, 18. The latter could hardly be clearly grasped at all. Among odd numbers 3, 5, 7 were the series easiest caught; next, 9, 15; hardest of all, 11 and 13; and 17 was impossible to apprehend.
- [522] The exact interval of the sparks was 0.00205". The doubleness of their snap was usually replaced by a single-seeming sound when it fell to 0.00198", the sound becoming *louder* when the sparks seemed simultaneous. The *difference* between these two intervals is only 7/100000 of a second; and, as Exner remarks, our ear and brain must be wonderfully efficient organs to get distinct feelings from so slight an objective difference as this. See Pflüger's Archiv, Bd. xi.
- [523] *Ibid.* p. 407. When the sparks fell so close together that their irradiation-circles overlapped, they appeared like *one spark moving* from the position of the first to that of the second; and they might then follow each other as close as 0.015" without the *direction of the movement* ceasing to be clear. When one spark fell on the centre, the other on the margin, of the retina, the time-interval for successive apprehension had to be raised to 0.076".
- [524] Hall and Jastrow: Studies of Rhythm. Mind, xi, 58.
- [525] Nevertheless, multitudinous impressions may be felt as discontinuous, though separated by excessively minute intervals of time. Grünhagen says (Pflüger's Archiv, vi, 175) that 10,000 electric shocks a second are felt as interrupted, by the tongue (!). Von Wittich (*ibid.* ii, 329), that between 1000 and 2000 strokes a second are felt as discrete by the finger. W. Preyer, on the other hand (Die Grenzen des Empfindungsvermögens, etc., 1868, p. 15), makes contacts appear

continuous to the finger when 36.8 of them follow in a second. Similarly, Mach (Wiener Sitzgsb., li, 2, 142) gives about 26. Lalanne (Comptes Rendus, i/xxxii, p. 1314) found summation of finger contacts after 22 repetitions in a second. Such discrepant figures are of doubtful worth. On the retina 20 to 30 impressions a second at the very utmost can be felt as discrete when they fall on the same spot. The ear, which begins to fuse stimuli together into a musical tone when they follow at the rate of a little over 30 a second, can still feel 132 of them a second as discontinuous when they take the shape of 'beats' (Helmholtz, Tonempfindungen, 3d ed. p. 270).

- [526] Pflüger's Archiv, xi, 428. Also in Herrmann's Hdbh. d. Physiol., 2 Bd. i, Thl. pp. 260-2.
- [527] Pflüger's Archiv, vii, 639. Tigerstedt (Bihang till Kongl. Svenska Vetenskaps Akad, Handl., Bd. 8, Häfte 2, Stockholm, 1884) revises Exner's figures, and shows that his conclusions are exaggerated. According to Tigerstedt, two observers almost always rightly appreciated 0.05 or 0.06" of reaction-time difference. Half the time they did it rightly when the difference sank to 0.03", though from 0.03" and 0.06" differences were often not noticed at all. Buccola found (La Legge del Tempo nei Fenomeni dei Pensiero, Milano, 1883, p. 371) that, after much practice in making rapid reactions upon a signal, he estimated directly, in figures, his own reaction-time, in 10 experiments, with an error of from 0.016" to 0.018"; in 6, with one of 0.005" to 0.069"; in one, with one of 0.002"; and in 3, with one of 0.003".
- [528] Mind, xi, 61 (1886).
- [529] Mach, Wiener Sitzungsab., li, 2. 133 (1865); Estel, *loc. cit.* p. 65; Mehner, *loc. cit.* p. 586; Buccola, *op. cit.* p. 378. Fechner labors to prove that his law is only overlaid by other interfering laws in the figures recorded by these experimenters; but his case seems to me to be one of desperate infatuation with a hobby. (See Wundt's Philosophische Studien iii, 1.)
- [530] Curious discrepancies exist between the German and the American observers with respect to the *direction* of the error below and above the point of indifference—differences perhaps due the *fatigue* involved in the American method. The Germans lengthened intervals below it and shortened those above. With seven Americans experimented on by Stevens this was exactly reversed. The German method was to passively listen to the intervals, then judge; the American was to reproduce them actively by movements of the hand. In Mehner's experiments there was found a second indifference point at about 5 seconds, beyond which times were judged again too long. Glass, whose work on the subject is the latest (Philos. Studien, iv, 423) found (when corrections were allowed for) that all times except 0.8 sec. were estimated too short. He found a series of points of greatest relative accuracy, viz. at 1.5, 2.5, 3.75, 5, 6.25, etc., seconds respectively, and thought that his observations roughly corroborated Weber's law. As 'maximum' and 'minimum' are printed interchangeably in Glass's article it is hard to follow.
- [531] With Vierordt and his pupils the indifference point lay as high as from 1.5 sec to 4.9 sec, according to the observer (cf. Der Zeitsinn, 1868, p. 112). In most of these experiments the time heard was actively reproduced, after a short pause, by movements of the hand, which were recorded. Wundt gives good reasons (Physiol. Psych., ii, 289, 290) for rejecting Vierordt's figures as erroneous. Vierordt's book, it should be said, is full of important matter, nevertheless.
- [532] Physiol. Psych., ii, 286, 290.
- [533] Philosophische Studien, i, 86.
- [534] Mind, xi, 400.
- [535] *Loc cit.* p. 144.

- [536] *Op. cit.* p. 376. Mach's and Buccola's figures, it will be observed, are about *one half* of the rest—sub-multiples, therefore. It ought to be observed, however, that Buccola's figure has little value, his observations not being well fitted to show this particular point.
- [537] Estel's figures led him to think that *all* the multiples enjoyed this privilege; with Mehner, on the other hand, only the *odd* multiples showed diminution of the average error; thus, 0.71, 2.15, 3.55, 5, 6.4, 7.8, 9.3, and 10.65 second were respectively registered with the least error. Cf. *Phil. Studien*, ii, pp. 57, 562-5.
- [538] Cf. especially pp. 558-561.
- [539] Wundt: *Physiol. Psych.*, ii, 287. Hall and Jastrow: *Mind*, xi, 62.
- [540] Mehner: *loc. cit.* p. 553.
- [541] The number of distinguishable *differences* of speed between these limits is, as he takes care to remark, very much larger than 7. (*Der Zeitsinn*, p. 137).
- [542] P. 19, § 18, p. 112.
- [543] I leave the text just as it was printed in the *Journal of Speculative Philosophy* (for 'Oct. 1886') in 1887. Since then Münsterberg in his masterly *Beiträge zur experimentellen Psychologie* (Heft 2, 1889) seems to have made it clear what the sensible changes are by which we measure the lapse of time. When the time which separates two sensible impressions is less than one third of a second, he thinks it is almost entirely the amount to which the memory-image of the first impression has faded when the second one overtakes it, which makes us feel how wide they are apart (p. 29). When the time is longer than this, we rely, he thinks, exclusively upon the feelings of muscular tension and relaxation, which we are constantly receiving although we give to them so little of our direct attention. These feelings are primarily in the muscles by which we adopt our sense-organs in attending to the signals used, some of the muscles being in the eye and ear themselves, some of them in the head, neck, etc. We here judge two time-intervals to be equal when between the beginning and end of each we feel exactly similar relaxations and subsequent expectant tensions of these muscles to have occurred. In reproducing intervals ourselves we try to make our feelings of this sort just what they were when we passively heard the interval. These feelings by themselves, however, can only be used when the intervals are very short, for the tension anticipatory of the terminal stimulus naturally reaches its maximum very soon. With longer intervals we *take the feeling of our inspirations and expirations into account*. With our expirations all the other muscular tensions in our body undergo a rhythmical decrease; with our inspirations the reverse takes place. When, therefore, we note a time-interval of several seconds with intent to reproduce it, what we seek is to make the earlier and later interval agree in the number and amount of these respiratory changes combined with sense-organ adjustments with which they are filled. Münsterberg has studied carefully in his own ease the variations of the respiratory factor. They are many; but he sums up his experience by saying that whether he measured by inspirations that were divided by momentary pauses into six parts, or by inspirations that were continuous; whether with sensory tension during inspiration and relaxation during expiration, or by tension during both inspiration and expiration, separated by a sudden interpolated relaxation; whether with special notice taken of the cephalic tensions, or of those in the trunk and shoulders, in all cases alike and without exception he involuntarily endeavored, whenever he compared two times or tried to make one the same as the other, to get exactly the same respiratory conditions and conditions of tension, *all* the subjective conditions, in short, *exactly* the same during the second interval as they were during the first. Münsterberg corroborated his subjective observations by experiments. The observer of the time had to reproduce as exactly as possible an interval between two sharp sounds given him by an assistant. The only condition imposed upon him was that he should not

modify his breathing for the purposes of measurement. It was then found that when the assistant broke in at random with his signals, the judgment of the observer was vastly less accurate than when the assistant carefully watched the observer's breathing and made both the beginning of the time given him and that of the time which he was to give coincide with identical phases thereof.—Finally, Münsterberg with great plausibility tries to explain the discrepancies between the results of Vierordt, Estel, Mehner, Glass, etc., as due to the fact that they *did not all use the same measure*. Some breathe a little faster, some a little slower. Some break their inspirations into two parts, some do not, etc. The coincidence of the objective times measured with definite natural phases of breathing would very easily give periodical maxima of facility in measuring accurately.

- [544] "Any one wishing yet further examples of this mental substitution will find one on observing how habitually he thinks of the spaces on the clock-face instead of the periods they stand for; how, on discovering it to be half an hour later than he supposed, he does not represent the half hour in its duration, but scarcely passes beyond the sign of it marked by the finger." (H. Spencer: Psychology, § 336.)
- [545] The only objections to this which I can think of are: (1) The accuracy with which some men judge of the hour of day or night without looking at the clock; (2) the faculty some have of waking at a preappointed hour; (3) the accuracy of time-perception reported to exist in certain trance-subjects. It might seem that in these persons some sort of a sub-conscious record was kept of the lapse of time *per se*. But this cannot be admitted until it is proved that there are no physiological processes, the feeling of whose course may serve as a *sign* of how much time has sped, and so lead us to infer the hour. That there are such processes it is hardly possible to doubt. An ingenious friend of mine was long puzzled to know why each day of the week had such a characteristic physiognomy to him. That of Sunday was soon noticed to be due to the cessation of the city's rumbling, and the sound of people's feet shuffling on the sidewalk; of Monday, to come from the clothes drying in the yard and casting a white reflection on the ceiling; of Tuesday, to a cause which I forget; and I think my friend did not get beyond Wednesday. Probably each hour in the day has for most of us some outer or inner sign associated with it as closely as these signs with the days of the week. It must be admitted, after all, however, that the great improvement of the time-perception during sleep and trance is a mystery not as yet cleared up. All my life I have been struck by the accuracy with which I will wake at the same exact minute night after night and morning after morning, if only the habit fortuitously begins. The organic registration in me is independent of sleep. After lying in bed a long time awake I suddenly rise without knowing the time, and for days and weeks together will do so at an identical minute by the clock, as if some inward physiological process caused the act by punctually running down.—Idiots are said sometimes to possess the time-measuring faculty in a marked degree. I have an interesting manuscript account of an idiot girl which says: "She was punctual almost to a minute in her demand for food and other regular attentions. Her dinner was generally furnished her at 12.30 p. m., and at that hour she would begin to scream if it were not forthcoming. If on Fast-day or Thanksgiving it were delayed, in accordance with the New England custom, she screamed from her usual dinner-hour until the food was carried to her. On the next day, however, she again made known her wants promptly at 12.30. Any slight attention shown her on one day was demanded on the next at the corresponding hour. If an orange were given her at 4 p. m. on Wednesday, at the same hour on Thursday she made known her expectation, and if the fruit were not given her she continued to call for it at intervals for two or three hours. At four on Friday the process would be repeated but would last less long; and so on for two or three days. If one of her sisters visited her accidentally at a certain hour, the sharp piercing scream was sure to summon her at the same hour the next day," etc., etc.—For these obscure matters consult C. Du Prel: The Philosophy of Mysticism, chap. iii, § 1.

- [546] Ideale Fragen (1878). p. 219 (Essay, 'Zeit und Weile').
- [547] Revue Philosophique, vol. iii, p. 496.
- [548] "Empty time is most strongly perceived when it comes as a *pause* in music or in speech. Suppose a preacher in the pulpit, a professor at his desk, to stick still in the midst of his discourse; or let a composer (as is sometimes purposely done) make all his instruments stop at once; we await every instant the resumption of the performance, and, in this awaiting, perceive, more than in any other possible way, the empty time. To change the example, let, in a piece of polyphonic music—a figure, for instance, in which a tangle of melodies are under way—suddenly a single voice be heard, which sustains a long note, while all else is hushed.... This one note will appear very protracted—why? Because we *expect* to hear accompanying it the notes of the other instruments, but they fail to come." (Herbart: Psychol. als W., § 115.)—Compare also Münsterberg, Beiträge, Heft 2, p. 41.
- [549] A night of pain will seem terribly long: we keep looking forward to a moment which never comes—the moment when it shall cease. But the odiousness of this experience is not named *ennui* or *Langweile*, like the odiousness of time that seems long from its emptiness. The more positive odiousness of the pain, rather, is what tinges our memory of the night. What we feel, as Prof. Lazarus says (*op. cit.* p. 202), is the long time of the suffering, not the suffering of the long time *per se*.
- [550] On these variations of time-estimate, cf. Romanes, Consciousness of Time, in Mind, vol. iii, p. 297; J. Sully, Illusions, pp. 245-261, 302-305; W. Wundt. Physiol. Psych., ii, 287, 288; besides the essays quoted from Lazarus and Janet. In German, the successors of Herbart have treated of this subject: compare Volkmann's Lehrbuch d. Psych., § 89, and for references to other authors his note 3 to this section. Lindner (Lbh. d. empir. Psych.), as a parallel effect, instances Alexander the Great's life (thirty-three years), which seems to us as if it must be long, because it was so eventful. Similarly the English Commonwealth, etc.
- [551] Physiol. Optik, p. 445.
- [552] Succession, time *per se*, is no force. Our talk about its devouring tooth, etc., is all elliptical. Its contents are what devour. The law of inertia is incompatible with time's being assumed as an efficient cause of anything.
- [553] Lehrbuch d. Psych., § 87. Compare also H. Lotze, Metaphysik, § 154.
- [554] The cause of the perceiving, not the object perceived!
- [555] "'No more' and 'not yet' are the proper time-feelings, and we are aware of time in no other way than through these feelings," says Volkmann (Psychol., § 87). This, which is not strictly true of our feeling of *time per se*, as an elementary bit of duration, is true of our feeling of *date* in its events.
- [556] We construct the miles just as we construct the years. Travelling in the cars makes a succession of different fields of view pass before our eyes. When those that have passed from present sight revive in memory, they maintain their mutual order because their contents overlap. We think them as having been before or behind each other; and, from the multitude of the views we can recall behind the one now presented, we compute the total space we have passed through.

It is often said that the perception of time develops later than that of space, because children have so vague an idea of all dates before yesterday and after tomorrow. But no vaguer than they have of extensions that exceed as greatly their unit of space-intuition. Recently I heard my child of four tell a visitor that he had been 'as much as one week' in the country. As he had been there three months, the visitor expressed surprise; whereupon the child corrected himself by saying he had been there 'twelve years.' But the child made exactly the same kind of mistake

when he asked if Boston was not one hundred miles from Cambridge, the distance being three miles.

[557] Most of these explanations simply give the *signs* which, adhering to impressions, lead us to date them within a duration, or, in other words, to assign to them their order. Why it should be a *time*-order, however, is not explained. Herbart's would-be explanation is a simple description of time-perception. He says it comes when, with the last member of a series present to our consciousness, we also think of the first; and then the whole series revives in our thought at once, but with strength diminishing in the backward direction (Psychol. als Wiss., § 115; Lehrb. zur Psychol., §§ 171, 172, 175). Similarly Drobisch, who adds that the series must appear as one already *elapsed* (*durchlaufene*), a word which shows even more clearly the question-begging nature of this sort of account (Empirische Psychol., § 59). Th. Waitz is guilty of similar question-begging when he explains our time-consciousness to be engendered by a set of unsuccessful attempts to make our percepts agree with our *expectations* (Lehrb. d. Psychol., § 52). Volkman's mythological account of past representations striving to drive present ones out of the seat of consciousness, being driven *back* by them, etc., suffers from the same fallacy (Psychol., § 87). But all such accounts agree in implying one fact—viz., that the brain-processes of various events must be active simultaneously, and in varying strength, for a time-perception to be possible. Later authors have made this idea more precise. Thus, Lipps: "Sensations arise, occupy consciousness, fade into images, and vanish. According as two of them, *a* and *b*, go through this process simultaneously, or as one precedes or follows the other, the *phases of their fading* will agree or differ; and the difference will be proportional to the time-difference between their several moments of beginning. Thus there are differences of *quality* in the images, which the mind may *translate* into corresponding differences of their temporal order. There is no other possible middle term between the objective time-relations and those in the mind than these differences of phase." (Grundtatsachen des Seelenlebens, p. 588.) Lipps accordingly calls them 'temporal signs,' and hastens explicitly to add that the soul's translation of their order of strength into a time-order is entirely inexplicable (p. 591). M. Guyau's account (Revue Philosophique, xix, 353) hardly differs from that of his predecessors, except in picturesqueness of style. Every change leaves a series of *trainées lumineuses* in the mind like the passage of shooting stars. Each image is in a more fading phase, according as its original was more remote. This group of images gives duration, the mere time-form, the 'bed' of time. The distinction of past, present, and future within the bed comes from our active nature. The future (as with Waitz) is what I want, but have not yet got, and must wait for. All this is doubtless true, but is no *explanation*.

Mr. Ward gives, in his Encyclopædia Britannica article (Psychology, p. 65, col. 1), a still more refined attempt to specify the 'temporal sign.' The problem being, among a number of other things thought as successive, but simultaneously thought, to determine which is first and which last, he says: "After each distinct representation, *a b c d*, there may intervene the representation of that *movement of attention* of which we are aware in passing from one object to another. In our present reminiscence we have, it must be allowed, little direct proof of this intervention; though there is, I think, indirect evidence of it in the tendency of the flow of ideas to follow the order in which the presentations were at first attended to. With the movement itself when the direction of attention changes, we are familiar enough, though the residua of such movements are not ordinarily conspicuous. These residua, then, are our temporal signs.... But temporal signs alone will not furnish all the pictorial exactness of the time-perspective. These give us only a fixed series; but the law of obliviscence, by insuring a progressive variation in intensity as we pass from one member of the series to the other, yields the effect which we call time-distance. By themselves such variations in intensity would leave us liable to confound more vivid representations in the distance with

fainter ones nearer the present, but from this mistake the temporal signs save us; where the memory-continuum is imperfect such mistakes continually occur. On the other hand, where these variations are slight and imperceptible, though the memory-continuum preserves the order of events intact, we have still no such distinct appreciation of comparative distance in time as we have nearer to the present, where these perceptive effects are considerable.... Locke speaks of our ideas succeeding each other 'at certain distances not much unlike the images in the inside of a lantern turned round by the heat of a candle,' and 'guesses' that 'this appearance of theirs in train varies not very much in a waking man.' *Now what is this 'distance' that separates a from b, b from c, and so on;* and what means have we of knowing that it is tolerably constant in waking life? *It is, probably, that, the residuum of which I have called a temporal sign; or, in other words, it is the movement of attention from a to b.*" Nevertheless, Mr. Ward does not call our feeling of this movement of attention the *original* of our feeling of time, or its brain-process the brain-process which directly causes us to perceive time. He says, a moment later, that "though the fixation of attention does of course really occupy time, it is probably not in the first instance perceived as time—i.e. as continuous 'protensity,' to use a term of Hamilton's—but as intensity. Thus, if this supposition be true, there is an element in our concrete time perceptions which has no place in our abstract conception of Time. In Time physically conceived there is no trace of intensity; in time psychically experienced, duration is primarily an intensive magnitude, and so far literally a perception." Its 'original' is, then, if I understand Mr Ward, something like a *feeling* which accompanies, as pleasure and pain may accompany, the movements of attention. Its brain-process must, it would seem, be assimilated in general type to the brain-processes of pleasure and pain. Such would seem more or less consciously to be Mr. Ward's own view, for he says: "Everybody knows what it is to be distracted by a rapid succession of varied impressions, and equally what it is to be wearied by the slow and monotonous recurrence of the same impressions. Now these 'feelings' of distraction and tedium owe their characteristic qualities to movements of attention. In the first, attention is kept incessantly on the move; before it is accommodated to *a*, it is disturbed by the suddenness, intensity, and novelty of *b*; in the second, it is kept all but stationary by the repeated presentation of the same impression. Such excess and defect of surprises make one realize a fact which in ordinary life is so obscure as to escape notice. But recent experiments have set this fact in a more striking light, and made clear what Locke had dimly before his mind in talking of a certain distance between the presentations of a waking man. In estimating very short periods of time of a second or less, indicated, say, by the beats of a metronome, it is found that there is a certain period for which the mean of a number of estimates is correct, while shorter periods are on the whole over-, and longer periods under-estimated. I take this to be evidence of the time occupied in accommodating or fixing attention." Alluding to the fact that a series of experiences, *a b c d e*, may seem short in retrospect, which seemed everlasting in passing, he says: "What tells in retrospect is the series *a b c d e*, etc.; what tells in the present is the intervening *t₁ t₂ t₃*, etc., or rather the original accommodation of which these temporal signs are the residuum." And he concludes thus: "We seem to have proof that our perception of duration rests ultimately upon quasi-motor objects of varying intensity, the duration of which we do not directly experience as duration at all."

Wundt also thinks that the interval of about three-fourths of a second, which is estimated with the minimum of error, points to a connection between the time-feeling and the succession of distinctly 'apperceived' objects before the mind. The 'association-time' is also equal to about three fourths of a second. This association-time he regards as a sort of internal standard of duration to which we involuntarily assimilate all intervals which we try to reproduce, bringing shorter ones up to it and longer ones down. [In the Stevens result we should have to say *contrast* instead of assimilate, for the longer intervals there seem longer, and the

shorter ones shorter still.] "Singularly enough," he adds (Physiol. Psych., ii, 286), "this time is about that in which in rapid walking, according to the Webers, our legs perform their swing. It seems thus not unlikely that both psychical constants, that of the average speed of reproduction and that of the surest estimation of time, have formed themselves under the influence of those most habitual movements of the body which we also use when we try to subdivide rhythmically longer tracts of time."

Finally, Prof. Mach makes a suggestion more specific still. After saying very rightly that we have a real *sensation* of time—how otherwise should we identify two entirely different airs as being played in the same 'time'? how distinguish in memory the first stroke of the clock from the second, unless to each there clove its special time-sensation, which revived with it?—he says "it is probable that this feeling is connected with that organic *consumption* which is necessarily linked with the production of consciousness, and that the time which we feel is probably due to the [mechanical?] *work of* [the process of?] *attention*. When attention is strained, time seems long; during easy occupation, short, etc.... The fatigue of the organ of consciousness, as long as we wake, continually increases, and the work of attention augments as continually. Those impressions which are conjoined with a *greater amount* of work of attention appear to us as the *later*." The apparent relative displacement of certain simultaneous events and certain anachronisms of dreams are held by Mach to be easily explicable as effects of a splitting of the attention between two objects, one of which consumes most of it (Beiträge zur Analyse der Empfindungen, p. 103 foll.). Mach's theory seems worthy of being better worked out. It is hard to say now whether he, Ward, and Wundt mean at bottom the same thing or not. The theory advanced in my own text, it will be remarked, does not pretend to be an *explanation*, but only an elementary statement of the 'law' which makes us aware of time. The Herbartian mythology purports to *explain*.

[558] It would be rash to say definitely just how many seconds long this specious present must needs be, for processes fade 'asymptotically,' and the distinctly intuited present merges into a penumbra of mere dim *recency* before it turns into the past which is simply reproduced and conceived. Many a thing which we do not distinctly date by intercalating it in a place between two other things will, nevertheless, come to us with this feeling of belonging to a *near* past. This sense of recency is a feeling *sui generis*, and may affect things that happened hours ago. It would seem to show that their brain-processes are still in a state modified by the foregoing excitement, still in a 'fading' phase, in spite of the long interval.

[559] Physiol. Psych, ii, 263.

[560] I leave my text as it was printed before Münsterberg's essay appeared (see [Footnote 542](#), above). He denies that we measure any but minimal durations by the amount of fading in the ideational processes, and talks almost exclusively of our feelings of muscular tension in his account, whereas I have made no mention of such things in mine. I cannot, however, see that there is any conflict between what he and I suggest. I am mainly concerned with the consciousness of duration regarded as a specific sort of object, he is concerned with this object's measurement exclusively. Feelings of tension might be the means of the measurement, whilst overlapping processes of any and every kind gave the object to be measured. The accommodative and respiratory movements from which the feelings of tension come form regularly recurring sensations divided by their 'phases' into intervals as definite as those by which a yardstick is divided by the marks upon its length.

Let a^1, a^2, a^3, a^4 , be homologous phases in four successive movements of this kind. If four outer stimuli 1, 2, 3, 4, coincide each with one of these successive phases, then their 'distances apart' are felt as *equal*, otherwise not. But there is no reason whatever to suppose that the mere overlapping of the brain-process of 2 by

the fading process of 1, or that of 3 by that of 2, etc., does not give the *characteristic quality of content* which we call 'distance apart' in this experience, and which by aid of the muscular feelings gets judged to be equal. Doubtless the muscular feelings can give us the object 'time' as well as its measure, because their earlier phases leave fading sensations which constantly overlap the vivid sensation of the present phase. But it would be contrary to analogy to suppose that they should be the only experiences which give this object. I do not understand Herr Münsterberg to claim this for them. He takes our sense of time for granted, and only discusses its measurement.

- [561] Exner in Hermann's Hdbch. d. Physiol., Bd. ii, Thl. ii, p. 281. Richet in Revue Philosophique, xxi, 568 (juin, 1886). See the next chapter, pp. 642-646.
- [562] I have spoken of *fading* brain-processes alone, but only for simplicity's sake. *Dawning* processes probably play as important a part in giving the feeling of duration to the specious present.
- [563] Reden (St. Petersburg, 1864), vol. i, pp. 255-268.
- [564] Psychology, § 91.
- [565] "The patient cannot retain the image of an object more than a moment. His memory is as short for sounds, letters, figures, and printed words. If we cover a written or printed word with a sheet of paper in which a little window has been cut, so that only the first letter is visible through the window, he pronounces this letter. If, then, the sheet is moved so as to cover the first letter and make the second one visible, he pronounces the second, but forgets the first, and cannot pronounce the first and second together." And so forth to the end. "If he closes his eyes and draws his finger exploringly over a well-known object like a knife or key, he cannot combine the separate impressions and recognize the object. But if it is put into his hand so that he can simultaneously touch it with several fingers, he names it without difficulty. This patient has thus lost the capacity for grouping successive ... impressions ... into a whole and perceiving them as a whole." (Grashey, in Archiv für Psychiatrie, Bd. xvi, pp. 672-673.) It is hard to believe that in such a patient the time intuited was not clipped off like the impressions it held, though perhaps not so much of it.

I have myself often noted a curious exaggeration of time-perspective at the moment of a falling asleep. A person will be moving or doing something in the room, and a certain stage of his act (whatever it may be) will be my last waking perception. Then a subsequent stage will wake me to a new perception. The two stages of the act will not be more than a few seconds apart; and yet it always seems to me as if, between the earlier and the later one, a long interval has passed away. I conjecturally account for the phenomenon thus, calling the two stages of the act *a* and *b* respectively: Were I awake, *a* would leave a fading process in my sensorium which would overlap the process of *b* when the latter came, and both would then appear in the same specious present, *a* belonging to its earlier end. But the sudden advent of the brain-change called sleep extinguishes *a*'s fading process abruptly. When *b* then comes and wakes me, *a* comes back, it is true, but not as belonging to the specious present. It has to be specially *revoked* in memory. This mode of revocation usually characterizes long-past things—whence the illusion.

- [566] Again I omit the future, merely for simplicity's sake.

In the last chapter what concerned us was the direct *intuition* of time. We found it limited to intervals of considerably less than a minute. Beyond its borders extends the immense region of *conceived* time, past and future, into one direction or another of which we mentally project all the events which we think of as real, and form a systematic order of them by giving to each a date. The relation of conceived to intuited time is just like that of the fictitious space pictured on the flat back-scene of a theatre to the actual space of the stage. The objects painted on the former (trees, columns, houses in a receding street, etc.) carry back the series of similar objects solidly placed upon the latter, and we think we see things in a continuous perspective, when we really see thus only a few of them and imagine that we see the rest. The chapter which lies before us deals with the way in which we paint the remote past, as it were, upon a canvas in our memory, and yet often imagine that we have direct vision of its depths.

The stream of thought flows on; but most of its segments fall into the bottomless abyss of oblivion. Of some, no memory survives the instant of their passage. Of others, it is confined to a few moments, hours, or days. Others, again, leave vestiges which are indestructible, and by means of which they may be recalled as long as life endures. Can we explain these differences?

PRIMARY MEMORY.

The first point to be noticed is that *for a state of mind to survive in memory it must have endured, for a certain length of time*. In other words, it must be what I call a substantive state. Prepositional and conjunctival states of mind are not remembered as independent facts—we cannot recall just how we felt when we said 'how' or 'notwithstanding.' Our consciousness of these transitive states is shut up to their own moment—hence one difficulty in introspective psychologizing. [Pg 644]

Any state of mind which is shut up to its own moment and fails to become an object for succeeding states of mind, is as if it belonged to another stream of thought. Or rather, it belongs only physically, not intellectually, to its own stream, forming a bridge from one segment of it to another, but not being appropriated inwardly by former segments or appearing as part of the empirical self, in the manner explained in [Chapter X](#). All the intellectual value for us of a state of mind depends on our after-memory of it. Only then is it combined in a system and knowingly made to contribute to a result. Only then does it *count* for us. So that *the EFFECTIVE consciousness we have of our states is the after-consciousness*; and the more of this there is, the more influence does the original state have, and the more permanent a factor is it of our world. An indelibly-imprinted pain may color a life; but, as Professor Richet says:

"To suffer for only a hundredth of a second is not to suffer at all; and for my part I would readily agree to undergo a pain, however acute and intense it might be, provided it should last only a hundredth of a second, and leave after it neither reverberation nor recall."^[567]

Not that a momentary state of consciousness need be practically resultless. Far from it: such a state, though absolutely unremembered, might at its own moment determine the transition of our thinking in a vital way, and decide our action irrevocably.^[568] But the *idea* of it could not *afterwards* determine transition and action, its content could not be conceived as one of the mind's permanent meanings: that is all I mean by saying that its intellectual value lies in after-memory. [Pg 645]

As a rule sensations outlast for some little time the objective stimulus which occasioned them. This phenomenon is the ground of those 'after-images' which are familiar in the physiology of the sense-organs. If we open our eyes instantaneously upon a scene, and then

shroud them in complete darkness, it will be as if we saw the scene in ghostly light through the dark screen. We can read off details in it which were unnoticed whilst the eyes were open.^[569]

In every sphere of sense, an intermittent stimulus, often enough repeated, produces a continuous sensation. This is because the after-image of the impression just gone by blends with the new impression coming in. The effects of stimuli may thus be superposed upon each other many stages deep, the total result in consciousness being an increase in the feeling's intensity, and in all probability, as we saw in the last chapter, an elementary sense of the lapse of time (see [p. 635](#)).

Exner writes:

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"Impressions to which we are inattentive leave so brief an image in the memory that it is usually overlooked. When deeply absorbed, we do not hear the clock strike. But our attention may awake after the striking has ceased, and we may then count off the strokes. Such examples are often found in daily life. We can also prove the existence of this *primary memory-image*, as it may be called, in another person, even when his attention is completely absorbed elsewhere. Ask someone, e.g., to count the lines of a printed page as fast as he can, and whilst this is going on walk a few steps about the room. Then, when the person has done counting, ask him where you stood. He will always reply quite definitely that you have walked. Analogous experiments may be made with vision. This primary memory-image is, whether attention have been turned to the impression or not, an extremely lively one, but is subjectively quite distinct from every sort of after-image or hallucination.... It vanishes, if not caught by attention, in the course of a few seconds. Even when the original impression is attended to, the liveliness of its image in memory fades fast."^[570]

The physical condition in the nerve-tissue of this primary memory is called by Richet 'elementary memory.'^[571] I much prefer to reserve the word memory for the conscious phenomenon. What happens in the nerve-tissue is but an example of that plasticity or of semi-inertness, yielding to change, but not yielding instantly or wholly, and never quite recovering the original form, which, in [Chapter V](#), we saw to be the groundwork of habit. Elementary *habit* would be the better name for what Professor Richet means. Well, the first manifestation of elementary habit is the slow dying away of an impressed movement on the neural matter, and its first effect in consciousness is this so-called elementary memory. But what elementary memory makes us aware of is the *just* past. The objects we feel in this directly intuited past differ from properly recollected objects. An object which is recollected, in the proper sense of that term, is one which has been absent from consciousness altogether, and now revives anew. It is brought back, recalled, fished up, so to speak, from a reservoir in which, with countless other objects, it lay buried and lost from view. But an object of primary memory is not thus brought back; it never was lost; its date was never cut off in consciousness from that of the immediately present moment. In fact it comes to us as belonging to the rearward portion of the present space of time, and not to the genuine past. In the last chapter we saw that the portion of time which we directly intuit has a breadth of several seconds, a rearward and a forward end, and may be called the specious present. All stimuli whose first nerve-vibrations have not yet ceased seem to be conditions of our getting this feeling of the specious present. They give rise to objects which appear to the mind as events just past.^[572]

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When we have been exposed to an unusual stimulus for many minutes or hours, a nervous process is set up which results in the haunting of consciousness by the impression for a long time afterwards. The tactile and muscular feelings of a day of skating or riding, after long disuse of the exercise, will come back to us all through the night. Images of the field of view

of the microscope will annoy the observer for hours after an unusually long sitting at the instrument. A thread tied around the finger, an unusual constriction in the clothing, will feel as if still there, long after they have been removed. These revivals (called phenomena of *Sinnesgedächtniss* by the Germans) have something periodical in their nature.^[573] They show that profound rearrangements and slow settlings into a new equilibrium are going on in the neural substance, and they form the transition to that more peculiar and proper phenomenon of memory, of which the rest of this chapter must treat. The first condition which makes a thing susceptible of recall after it has been forgotten is that the original impression of it should have been prolonged enough to give rise to a *recurrent* image of it, as distinguished from one of those primary after-images which very fleeting impressions may leave behind, and which contain in themselves no guarantee that they will ever come back after having once faded away.^[574] A certain length of stimulation seems demanded by the inertia of the nerve-substance. Exposed to a shorter influence, its modification fails to 'set,' and it retains no effective tendency to fall again into the same form of vibration at which the original feeling was due. This, as I said at the outset, may be the reason why only 'substantive' and not 'transitive' states of mind are as a rule recollected, at least as independent things. The transitive states pass by too quickly.

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ANALYSIS OF THE PHENOMENON OF MEMORY.

Memory proper, or secondary memory as it might be styled, is the knowledge of a former state of mind after it has already once dropped from consciousness; or rather *it is the knowledge of an event, or fact, of which meantime we have not been thinking, with the additional consciousness that we have thought or experienced it before.*

The first element which such a knowledge involves would seem to be the revival in the mind of an image or copy of the original event.^[575] And it is an assumption made by many writers^[576] that the revival of an image is all that is needed to constitute the memory of the original occurrence. But such a revival is obviously not a *memory*, whatever else it may be; it is simply a duplicate, a second event, having absolutely no connection with the first event except that it happens to resemble it. The clock strikes to-day; it struck yesterday; and may strike a million times ere it wears out. The rain pours through the gutter this week; it did so last week; and will do so *in sæcula sæculorum*. But does the present clock-stroke become aware of the past ones, or the present stream recollect the past stream, because they repeat and resemble them? Assuredly not. And let it not be said that this is because clock-strokes and gutters are physical and not psychical objects; for psychical objects (sensations for example) simply recurring in successive editions will remember each other *on that account* no more than clock-strokes do. No memory is involved in the mere fact of recurrence. The successive editions of a feeling are so many independent events, each snug in its own skin. Yesterday's feeling is dead and buried; and the presence of to-day's is no reason why it should resuscitate. A farther condition is required before the present image can be held to stand for a *past original*.

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That condition is that the fact imaged be *expressly referred to the past*, thought as *in the past*. But how can we think a thing as in the past, except by thinking of the past together with the thing, and of the relation of the two? And how can we think of the past? In the chapter on Time-perception we have seen that our intuitive or immediate consciousness of pastness hardly carries us more than a few seconds backward of the present instant of time. Remoter dates are conceived, not perceived; known symbolically by names, such as 'last week,' '1850;' or thought of by events which happened in them, as the year in which we attended such a school, or met with such a loss.—So that if we wish to think of a particular past epoch, we must think of a name or other symbol, or else of certain concrete events, associated therewithal. Both must be thought of, to think the past epoch adequately. And to

'refer' any special fact to the past epoch is to think that fact *with* the names and events which characterize its date, to think it, in short, with a lot of contiguous associates.

But even this would not be memory. Memory requires more than mere dating of a fact in the past. It must be dated in *my* past. In other words, I must think that I directly experienced its occurrence. It must have that 'warmth and intimacy' which were so often spoken of in the chapter on the Self, as characterizing all experiences 'appropriated' by the thinker as his own.

A general feeling of the past direction in time, then, a particular date conceived as lying along that direction, and I defined by its name or phenomenal contents, an event imagined as located therein, and owned as part of my experience,—such are the elements of every act of memory.

It follows that what we began by calling the 'image,' or 'copy,' of the fact in the mind, is really not there at all in that simple shape, as a separate 'idea.' Or at least, if it be there as a separate idea, no memory will go with it. What memory goes with is, on the contrary, a very complex representation, that of the fact to be recalled *plus* its associates, the whole forming one 'object' (as explained on [page 275](#), Chapter IX), known in one integral pulse of consciousness (as set forth on [pp. 276 ff.](#)) and demanding probably a vastly more intricate brain-process than that on which any simple sensorial image depends.

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Most psychologists have given a perfectly clear analysis of the phenomenon we describe. Christian Wolff, for example, writes:

"Suppose you have seen Mevius in the temple, but now afresh in Titus' house. I say you *recognize* Mevius, that is, are conscious of having seen him before because, although now you perceive him with your senses along with Titus' house, your imagination produces an image of him along with one of the temple, and of the acts of your own mind reflecting on Mevius in the temple. Hence the idea of Mevius which is reproduced in sense is contained in another series of perceptions than that which formerly contained it, and this difference is the reason why we are conscious of having had it before.... For whilst now you see Mevius in the house of Titus, your imagination places him in the temple, and renders you conscious of the state of mind which you found in yourself when you beheld him there. By this you know that you have seen him before, that is, you recognize him. But you recognize him because his idea is now contained in another series of perceptions from that in which you first saw him."^[577]

Similarly James Mill writes:

"In my remembrance of George III., addressing the two houses of parliament, there is, first of all, the mere idea, or simple apprehension, the conception, as it is sometimes called, of the objects. There is combined with this, to make it memory, my idea of my having seen and heard those objects. And this combination is so close that it is not in my power to separate them. I cannot have the idea of George III.: his person and attitude, the paper he held in his hand, the sound of his voice while reading from it; without having the other idea along with it, that of my having been a witness of the scene.... If this explanation of the case in which we remember sensations is understood, the explanation of the case in which we remember ideas cannot occasion much of difficulty. I have a lively recollection of Polyphemus's cave, and the actions of Ulysses and the Cyclops, as described by Homer. In this recollection there is, first of all, the ideas, or simple conceptions of the objects and acts; and along with these ideas, and so closely combined as not to be separable, the idea of my

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having formerly had those same ideas. And this idea of my having formerly had those ideas is a very complicated idea; including the idea of myself of the present moment remembering, and that of myself of the past moment conceiving; and the whole series of the states of consciousness, which intervened between myself remembering, and myself conceiving."^[578]

Memory is then the feeling of belief in a peculiar complex object; but all the elements of this object may be known to other states of belief; nor is there in the particular combination of them as they appear in memory anything so peculiar as to lead us to oppose the latter to other sorts of thought as something altogether *sui generis*, needing a special faculty to account for it. When later we come to our chapter on Belief we shall see that any represented object which is connected either mediately or immediately with our present sensations or emotional activities tends to be believed in as a reality. The sense of a peculiar active relation in it to ourselves is what gives to an object the characteristic quality of reality, and a merely imagined past event differs from a recollected one only in the absence of this peculiar-feeling relation. The electric current, so to speak, between it and our present self does not close. But in their other determinations the re-recollected past and the imaginary past may be much the same. In other words, there is nothing unique in the *object* of memory, and no special faculty is needed to account for its formation. It is a synthesis of parts thought of as related together, perception, imagination, comparison and reasoning being analogous syntheses of parts into complex objects. The objects of any of these faculties may awaken belief or fail to awaken it; *the object of memory is only an object imagined in the past* (usually very completely imagined there) *to which the emotion of belief adheres*.

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MEMORY'S CAUSES.

Such being the *phenomenon* of memory, or the analysis of its object, can we see how it comes to pass? can we lay bare its causes?

Its complete exercise presupposes two things:

- 1) The *retention* of the remembered fact;
- 2) Its *reminiscence, recollection, reproduction, or recall*.

Now *the cause both of retention and of recollection is the law of habit in the nervous system, working as it does in the 'association of ideas.'*

Associationists have long explained *recollection* by association. James Mill gives an account of it which I am unable to improve upon, unless it might be by translating his word 'idea' into 'thing thought of,' or 'object,' as explained so often before.

"There is," he says, "a state of mind familiar to all men, in which we are said to remember. In this state it is certain we have not in the mind the idea which we are trying to have in it."^[579] How is it, then, that we proceed in the course of our endeavor, to procure its introduction into the mind? If we have not the idea itself, we have certain ideas connected with it. We run over those ideas, one after another, in hopes that some one of them will suggest the idea we are in quest of; and if any one of them does, it is always one so connected with it as to call it up in the way of association. I meet an old acquaintance, whose name I do not remember, and wish to recollect. I run over a number of names, in hopes that some of them may be associated with the idea of the individual. I think of all the circumstances in which I have seen him engaged; the time when I knew him, the persons along with whom I knew him, the things he did, or the things he suffered; and, if I chance upon any idea with which the name is associated,

then immediately I have the recollection; if not, my pursuit of it is vain.^[580] There is another set of cases, very familiar, but affording very important evidence on the subject. It frequently happens that there are matters which we desire not to forget. What is the contrivance to which we have recourse for preserving the memory—that is, for making sure that it will be called into existence, when it is our wish that it should? All men invariably employ the same expedient. They endeavor to form an association between the idea of the thing to be remembered, and some sensation, or some idea, which they know beforehand will occur at or near the time when they wish the remembrance to be in their minds. If this association is formed, and the association or idea with which it has been formed occurs; the sensation, or idea, calls up the remembrance; and the object of him who formed the association is attained. To use a vulgar instance: a man receives a commission from his friend, and, that he may not forget it, ties a knot in his handkerchief. How is this fact to be explained? First of all, the idea of the commission is associated with the making of the knot. Next, the handkerchief is a thing which it is known beforehand will be frequently seen, and of course at no great distance of time from the occasion on which the memory is desired. The handkerchief being seen, the knot is seen, and this sensation recalls the idea of the commission, between which and itself the association had been purposely formed."^[581]

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In short, we make search in our memory for a forgotten idea, just as we rummage our house for a lost object. In both cases we visit what seems to us the probable *neighborhood* of that which we miss. We turn over the things under which, or within which, or alongside of which, it may possibly be; and if it lies near them, it soon comes to view. But these matters, in the case of a mental object sought, are nothing but its *associates*. The machinery of recall is thus the same as the machinery of association, and the machinery of association, as we know, is nothing but the elementary law of habit in the nerve-centres.

And this same law of habit is the machinery of retention also. Retention means *liability* to recall, and it means nothing more than such liability. The only proof of there being retention is that recall actually takes place. The retention of an experience is, in short, but another name for the *possibility* of thinking it again, or the *tendency* to think it again, with its past surroundings. Whatever accidental cue may turn this tendency into an actuality, the permanent *ground* of the tendency itself lies in the organized neural paths by which the cue calls up the experience on the proper occasion, together with its past associates, the sense that the self was there, the belief that it really happened, etc., etc., just as previously described. When the recollection is of the 'ready' sort, the resuscitation takes place the instant the occasion arises; when it is slow, resuscitation comes after delay. But be the recall prompt or slow, the condition which makes it possible at all (or in other words, the 'retention' of the experience) is neither more nor less than the brain-paths which *associate* the experience with the occasion and cue of the recall. *When slumbering, these paths are the condition of retention; when active, they are the condition of recall.*

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A simple scheme will now make the whole cause of memory plain. Let *n* be a past event; *o* its 'setting' (concomitants, date, self present, warmth and intimacy, etc., etc., as already set forth); and *m* some present thought or fact which may appropriately become the occasion of its recall. Let the nerve-centres, active in the thought of *m*, *n*, and *o*, be represented by M, N, and O, respectively; then the *existence* of the paths M—N and N—O will be the fact indicated by the phrase 'retention of the event *n* in the memory,' and the *excitement* of the brain along these paths will be the condition of the event *n*'s actual recall. The *retention* of *n*, it will be observed, is no mysterious storing up of an 'idea' in an unconscious state. It is not a

fact of the mental order at all. It is a purely physical phenomenon, a morphological feature, the presence of these 'paths,' namely, in the finest recesses of the brain's tissue. The recall or recollection, on the other hand, is a *psycho-physical* phenomenon, with both a bodily and a mental side. The bodily side is the functional excitement of the tracts and paths in question; the mental side is the conscious vision of the past occurrence, and the belief that we experienced it before.

These habit-worn paths of association are a clear rendering of what authors mean by 'predispositions,' 'vestiges,' 'traces,' etc., left in the brain by past experience. Most writers leave the nature of these vestiges vague; few think of explicitly assimilating them to channels of association. Dr. Maudsley, for example, writes:

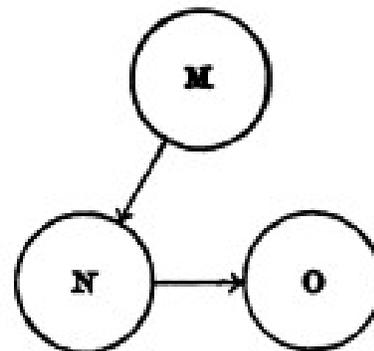


FIG. 45.

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"When an idea which we have once had is excited again, there is a reproduction of the same nervous current, with the conscious addition that it is a reproduction — it is the same idea *plus* the consciousness that it is the same. The question then suggests itself, What is the physical condition of this consciousness? What is the modification of the anatomical substrata of fibres and cells, or of their physiological activity, which is the occasion of this *plus* element in the reproduced idea? It may be supposed that the first activity did leave behind it, when it subsided, some after-effect, some modification of the nerve-element, whereby the nerve-circuit was disposed to fall again readily into the same action; such disposition appearing in consciousness as recognition or memory. Memory is, in fact, the conscious phase of this physiological disposition when it becomes active or discharges its functions on the recurrence of the particular mental experience. To assist our conception of what may happen, let us suppose the individual nerve-elements to be endowed with their own consciousness, and let us assume them to be, as I have supposed, modified in a certain way by the first experience; it is hard to conceive that when they fall into the same action on another occasion they should not recognize or remember it; for the second action is a reproduction of the first, with the addition of what it contains from the after-effects of the first. As we have assumed the process to be conscious, this reproduction with its addition would be a memory or remembrance."^[582]

In this passage Dr. Maudsley seems to mean by the 'nerve-element,' or 'anatomical substratum of fibres and cells,' something that corresponds to the N of our diagram. And the 'modification' he speaks of seems intended to be understood as an internal modification of this same particular group of elements. Now the slightest reflection will convince anyone that there is no conceivable ground for supposing that with the mere re-excitation of N there should arise the 'conscious addition' that it is a re-excitation. The two excitations are simply two excitations, their consciousnesses are two consciousnesses, they have nothing to do with each other. And a vague 'modification,' supposed to be left behind by the first excitation, helps us not a whit. For, according to all analogy, such a modification can only result in making the next excitation more smooth and rapid. This might make it less *conscious*, perhaps, but could not endow it with any reference to the past. The gutter is worn deeper by each successive shower, but not for that reason brought into contact with previous showers. Psychology (which Dr. Maudsley in his next sentence says "affords us not the least help in this matter") puts us on the track of an at least possible brain-explanation. As it is the *setting o* of the idea, when it recurs, which makes us conscious of it as past, so it can be no *intrinsic* modification of the 'nerve-element' N which is the organic condition of memory, but something extrinsic to it altogether, namely, its connections with those other nerve-

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elements which we called O—that letter standing in the scheme for the cerebral substratum of a great plexus of things other than the principal event remembered, dates, names, concrete surroundings, realized intervals, and what not. The 'modification' is the formation in the plastic nerve-substance of the system of associative paths between N and O.

The only hypothesis, in short, to which the facts of inward experience give countenance is that *the brain-tracts excited by the event proper, and those excited in its recall, are in part different from each other*. If we could revive the past event without any associates we should exclude the possibility of memory, and simply dream that we were undergoing the experience as if for the first time.^[583] Wherever, in fact, the recalled event does appear without a definite setting, it is hard to distinguish it from a mere creation of fancy. But in proportion as its image lingers and recalls associates which gradually become more definite, it grows more and more distinctly into a remembered thing. For example, I enter a friend's room and see on the wall a painting. At first I have the strange, wondering consciousness, 'surely I have seen that before,' but when or how does not become clear. There only clings to the picture a sort of penumbra of familiarity,—when suddenly I exclaim: "I have it, it is a copy of part of one of the Fra Angelicos in the Florentine Academy—I recollect it there!" But the motive to the recall does *not* lie in the fact that the brain-tract now excited by the painting was once before excited in a similar way; it lies simply and solely in the fact that with that brain-tract other tracts also are excited: those which sustain my friend's room with all its peculiarities, on the one hand; those which sustain the mental image of the Florence Academy, on the other hand, with the circumstances of my visit there; and finally those which make me (more dimly) think of the years I have lived through between these two times. The result of this total brain-disturbance is a thought with a peculiar object, namely, that I who now stand here with this picture before me, stood so many years ago in the Florentine Academy looking at its original.

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M. Taine has described the gradual way in which a mental image develops into an object of memory, in his usual vivid fashion. He says:

"I meet casually in the street a person whose appearance I am acquainted with, and say to myself at once that I have seen him before. Instantly the figure recedes into the past, and wavers about there vaguely, without at once fixing itself in any spot. It persists in me for some time, and surrounds itself with new details. 'When I saw him he was bare-headed, with a working-jacket on, painting in a studio; he is so-and-so, of such-and-such a street. But when was it? It was not yesterday, nor this week, nor recently. I have it: he told me that he was waiting for the first leaves to come out to go into the country. It was before the spring. But at what exact date? I saw, the same day, people carrying branches in the streets and omnibuses: it was Palm Sunday!' Observe the travels of the internal figure, its various shiftings to front and rear along the line of the past; each of these mental sentences has been a swing of the balance. When confronted with the present sensation and with the latent swarm of indistinct images which repeat our recent life, the figure first recoiled suddenly to an indeterminate distance. Then, completed by precise details, and confronted with all the shortened images by which we sum up the proceedings of a day or a week, it again receded beyond the present day, beyond yesterday, the day before, the week, still farther, beyond the ill-defined mass constituted by our recent recollections. Then something said by the painter was recalled, and it at once receded again beyond an almost precise limit, which is marked by the image of the green leaves and denoted by the word spring. A moment afterwards, thanks to a new detail, the recollection of the branches, it has shifted again, but forward this time, not backward; and, by a reference to the calendar, is situated at a precise point, a week further back than Easter, and five weeks nearer than the carnival, by the double effect of the contrary impulsions,

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pushing it, one forward and the other backward, and which are, at a particular moment, annulled by one another."^[584]

THE CONDITIONS OF GOODNESS IN MEMORY.

The remembered fact being *n*, then, the path N—O is what arouses for *n* its setting when it is recalled, and makes it other than a mere imagination. The path M—N, on the other hand, gives the cue or occasion of its being recalled at all. *Memory being this altogether conditioned on brain-paths, its excellence in a given individual will depend partly on the number and partly on the persistence of these paths.*

The persistence or permanence of the paths is a physiological property of the brain-tissue of the individual, whilst their number is altogether due to the facts of his mental experience. Let the quality of permanence in the paths be called the native tenacity, or physiological retentiveness. This tenacity differs enormously from infancy to old age, and from one person to another. Some minds are like wax under a seal—no impression, however disconnected with others, is wiped out. Others, like a jelly, vibrate to every touch, but under usual conditions retain no permanent mark. These latter minds, before they can recollect a fact, must weave it into their permanent stores of knowledge. They have no *desultory* memory. Those persons, on the contrary, who retain names, dates and addresses, anecdotes, gossip, poetry, quotations, and all sorts of miscellaneous facts, without an effort, have desultory memory in a high degree, and certainly owe it to the unusual tenacity of their brain-substance for any path once formed therein. No one probably was ever effective on a voluminous scale without a high degree of this physiological retentiveness. In the practical as in the theoretic life, the man whose acquisitions *stick* is the man who is always achieving and advancing, whilst his neighbors, spending most of their time in relearning what they once knew but have forgotten, simply hold their own. A Charlemagne, a Luther, a Leibnitz, a Walter Scott, any example, in short, of your quarto or folio editions of mankind, must needs have amazing retentiveness of the purely physiological sort. Men without this retentiveness may excel in the *quality* of their work at this point or at that, but will never do such mighty sums of it, or be influential contemporaneously on such a scale.^[585]

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But there comes a time of life for all of us when we can do no more than hold our own in the way of acquisitions, when the old paths fade as fast as the new ones form in our brain, and when we forget in a week quite as much as we can learn in the same space of time. This equilibrium may last many, many years. In extreme old age it is upset in the reverse direction, and forgetting prevails over acquisition or rather there is no acquisition. Brain-paths are so transient that in the course of a few minutes of conversation the same question is asked and its answer forgotten half a dozen times. Then the superior tenacity of the paths formed in childhood becomes manifest: the dotard will retrace the facts of his earlier years after he has lost all those of later date.

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So much for the permanence of the paths. Now for their number.

It is obvious that the more there are of such paths as M—N in the brain, and the more of such possible cues or occasions for the recall of *n* in the mind, the prompter and surer, on the whole, the memory of *n* will be, the more frequently one will be reminded of it, the more avenues of approach to it one will possess. In mental terms, *the more other facts a fact is associated with in the mind, the better possession of it our memory retains.* Each of its associates becomes a hook to which it hangs, a means to fish it up by when sunk beneath the surface. Together, they form a network of attachments by which it is woven into the entire tissue of our thought. The 'secret of a good memory' is thus the secret of forming diverse and multiple associations with every fact we care to retain. But this forming of associations with a fact, what is it but *thinking about* the fact as much as possible? Briefly, then, of two men with the same outward experiences and the same amount of mere native tenacity, *the*

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one who THINKS over his experiences most, and weaves them into systematic relations with each other, *will be the one with the best memory*. We see examples of this on every hand. Most men have a good memory for facts connected with their own pursuits. The college athlete who remains a dunce at his books will astonish you by his knowledge of men's 'records' in various feats and games, and will be a walking dictionary of sporting statistics. The reason is that he is constantly going over these things in his mind, and comparing and making series of them. They form for him not so many odd facts, but a concept-system—so they stick. So the merchant remembers prices, the politician other politicians' speeches and votes, with a copiousness which amazes outsiders, but which the amount of thinking they bestow on these subjects easily explains. The great memory for facts which a Darwin and a Spencer reveal in their books is not incompatible with the possession on their part of a brain with only a middling degree of physiological retentiveness. Let a man early in life set himself the task of verifying such a theory as that of evolution, and facts will soon cluster and cling to him like grapes to their stem. Their relations to the theory will hold them fast; and the more of these the mind is able to discern, the greater the erudition will become. Meanwhile the theorist may have little, if any, desultory memory. Unutilizable facts may be unnoted by him and forgotten as soon as heard. An ignorance almost as encyclopædic as his erudition may coexist with the latter, and hide, as it were, in the interstices of its web. Those who have had much to do with scholars and *savants* will readily think of examples of the class of mind I mean.

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In a system, every fact is connected with every other by some thought-relation. The consequence is that every fact is retained by the combined suggestive power of all the other facts in the system, and forgetfulness is well-nigh impossible.

The reason why *cramming* is such a bad mode of study is now made clear. I mean by cramming that way of preparing for examinations by committing 'points' to memory during a few hours or days of intense application immediately preceding the final ordeal, little or no work having been performed during the previous course of the term. Things learned thus in a few hours, on one occasion, for one purpose, cannot possibly have formed many associations with other things in the mind. Their brain-processes are led into by few paths, and are relatively little liable to be awakened again. Speedy oblivion is the almost inevitable fate of all that is committed to memory in this simple way. Whereas, on the contrary, the same materials taken in gradually, day after day, recurring in different contexts, considered in various relations, associated with other external incidents, and repeatedly reflected on, grow into such a system, form such connections with the rest of the mind's fabric, lie open to so many paths of approach, that they remain permanent possessions. This is the *intellectual* reason why habits of continuous application should be enforced in educational establishments. Of course there is no moral turpitude in cramming. If it led to the desired end of secure learning it would be infinitely the best method of study. But it does not; and students themselves should understand the reason why.

ONE'S NATIVE RETENTIVENESS IS UNCHANGEABLE.

It will now appear clear that *all improvement of the memory lies in the line of* ELABORATING THE ASSOCIATES of each of the several things to be remembered. *No amount of culture would seem capable of modifying a man's* GENERAL *retentiveness*. This is a physiological quality, given once for all with his organization, and which he can never hope to change. It differs no doubt in disease and health; and it is a fact of observation that it is better in fresh and vigorous hours than when we are fagged or ill. We may say, then, that a man's native tenacity will fluctuate somewhat with his hygiene, and that whatever is good for his tone of health will also be good for his memory. We may even say that whatever amount of intellectual exercise is bracing to the general tone and nutrition of the brain will also be profitable to the general retentiveness. But more than this we cannot say; and this, it is obvious, is far less than most people believe.

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It is, in fact, commonly thought that certain exercises, systematically repeated, will strengthen, not only a man's remembrance of the particular facts used in the exercises, but his faculty for remembering facts at large. And a plausible case is always made out by saying that practice in learning words by heart makes it easier to learn new words in the same way.^[586] If this be true, then what I have just said is false, and the whole doctrine of memory as due to 'paths' must be revised. But I am disposed to think the alleged fact untrue. I have carefully questioned several mature actors on the point, and all have denied that the practice of learning parts has made any such difference as is alleged. What it has done for them is to improve their power of *studying* a part systematically. Their mind is now full of precedents in the way of intonation, emphasis, gesticulation; the new words awaken distinct suggestions and decisions; are caught up, in fact, into a pre-existing net-work, like the merchant's prices, or the athlete's store of 'records,' and are recollected easier, although the mere native tenacity is not a whit improved, and is usually, in fact, impaired by age. It is a case of better remembering by better *thinking*. Similarly when schoolboys improve by practice in ease of learning by heart, the improvement will, I am sure, be always found to reside in the *mode of study of the particular piece* (due to the greater interest, the greater suggestiveness, the generic similarity with other pieces, the more sustained attention, etc., etc.), and not at all to any enhancement of the brute retentive power.

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The error I speak of pervades an otherwise useful and judicious book, 'How to Strengthen the Memory,' by Dr. Holbrook of New York.^[587] The author fails to distinguish between the general physiological retentiveness and the retention of particular things, and talks as if both must be benefited by the same means.

"I am now treating," he says, "a case of loss of memory in a person advanced in years, who did not know that his memory had failed most remarkably till I told him of it. He is making vigorous efforts to bring it back again, and with partial success. The method pursued is to spend two hours daily, one in the morning and one in the evening, in exercising this faculty. The patient is instructed to give the closest attention to all that he learns, so that it shall be impressed on his mind clearly. He is asked to recall every evening all the facts and experiences of the day, and again the next morning. Every name heard is written down and impressed on his mind clearly, and an effort made to recall it at intervals. Ten names from among public men are ordered to be committed to memory every week. A verse of poetry is to be learned, also a verse from the Bible, daily. He is asked to remember the number of the page in any book where any interesting fact is recorded. These and other methods are slowly resuscitating a failing memory."^[588]

I find it very hard to believe that the memory of the poor old gentleman is a bit the better for all this torture except in respect of the particular facts thus wrought into it, the occurrences attended to and repeated on those days, the names of those politicians, those Bible verses, etc., etc. In another place Dr. Holbrook quotes the account given by the late Thurlow Weed, journalist and politician, of his method of strengthening his memory.

"My memory was a sieve. I could remember nothing. Dates, names, appointments, faces—everything escaped me. I said to my wife, 'Catherine, I shall never make a successful politician, for I cannot remember, and that is a prime necessity of politicians.' My wife told me I must train my memory. So when I came home that night, I sat down alone and spent fifteen minutes trying silently to recall with accuracy the principal events of the day. I could remember but little at first; now I remember that I could not then recall what I had for breakfast. After a few days' practice I found I could recall more. Events came back to me more minutely, more accurately, and more vividly than at first.

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After a fortnight or so of this, Catherine said, 'Why don't you relate to me the events of the day, instead of recalling them to yourself? It would be interesting, and my interest in it would be a stimulus to you.' Having great respect for my wife's opinion, I began a habit of oral confession, as it were, which was continued for almost fifty years. Every night, the last thing before retiring, I told her everything I could remember that had happened to me or about me during the day. I generally recalled the dishes I had had for breakfast, dinner, and tea; the people I had seen and what they had said; the editorials I had written for my paper, giving her a brief abstract of them. I mentioned all the letters I had sent and received, and the very language used, as nearly as possible; when I had walked or ridden—I told her everything that had come within my observation. I found I could say my lessons better and better every year, and instead of the practice growing irksome, it became a pleasure to go over again the events of the day. I am indebted to this discipline for a memory of somewhat unusual tenacity, and I recommend the practice to all who wish to store up facts, or expect to have much to do with influencing men."^[589]

I do not doubt that Mr. Weed's practical command of his past experiences was much greater after fifty years of this heroic drill than it would have been without it. Expecting to give his account in the evening, he attended better to each incident of the day, named and conceived it differently, set his mind upon it, and in the evening went over it again. He did *more thinking* about it, and it stayed with him in consequence. But I venture to affirm pretty confidently (although I know how foolish it often is to deny a fact on the strength of a theory) that the same matter, *casually attended to and not thought about*, would have stuck in his memory no better at the end than at the beginning of his years of heroic self-discipline. He had acquired a better method of noting and recording his experiences, but his physiological retentiveness was probably not a bit improved.^[590]

All improvement of memory consists, then, in the improvement of one's habitual methods of recording facts. In the traditional terminology methods are divided into the mechanical, the ingenious, and the judicious. [Pg 667]
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The *mechanical methods* consist in the intensification, prolongation, and *repetition* of the impression to be remembered. The modern method of teaching children to read by blackboard work, in which each word is impressed by the four-fold channel of eye, ear, voice, and hand, is an example of an improved mechanical method of memorizing.

Judicious methods of remembering things are nothing but logical ways of conceiving them and working them into rational systems, classifying them, analyzing them into parts, etc., etc. All the sciences are such methods.

Of *ingenious methods*, many have been invented, under the name of technical memories. By means of these systems it is often possible to retain entirely disconnected facts, lists of names, numbers, and so forth, so multitudinous as to be entirely unrememberable in a natural way. The method consists usually in a framework learned mechanically, of which the mind is supposed to remain in secure and permanent possession. Then, whatever is to be remembered is deliberately associated by some fanciful analogy or connection with some part of this framework, and this connection thenceforward helps its recall. The best known and most used of these devices is the figure-alphabet. To remember numbers, e.g., a figure-alphabet is first formed, in which each numerical digit is represented by one or more letters. The number is then translated into such letters as will best make a word, if possible a word suggestive of the object to which the number belongs. The word will then be remembered when the numbers alone might be forgotten. [Pg 669]

"The most common figure-alphabet is this:

1, 2, 3, 4, 5, 6, 7, 8, 9, 0.

t, n, m, r, l, sh, g, f, b, s,
 d, j, k, v, p, c,
 ch, c, z,
 g, qu.

"To briefly show its use, suppose it is desired to fix 1142 feet in a second as the velocity of sound: t, t, r, n, are the letters and order required. Fill up with vowels forming a phrase, like 'tight run' and connect it by some such flight of the imagination as that if a man tried to keep up with the velocity of sound, he would have a tight run. When you recall this a few days later great care must be taken not to get confused with the velocity of light, nor to think he had a *hard* run which would be 3000 feet too fast."^[591]

Dr. Pick and others use a system which consists in linking together any two ideas to be remembered by means of an intermediate idea which will be suggested by the first and suggest the second, and so on through the list. Thus,

"Let us suppose that we are to retain the following series of ideas: garden, hair, watchman, philosophy, copper, etc.... We can combine the ideas in this manner: *garden*, plant, hair of plant—*hair*; *hair*, bonnet, *watchman*;—*watchman*, wake, study, *philosophy*; *philosophy*, chemistry, *copper*; etc. etc." (Pick.)^[592]

It is matter of popular knowledge that an impression is remembered the better in proportion as it is

- 1) More recent;
- 2) More attended to; and
- 3) More often repeated.

The effect of recency is all but absolutely constant. Of two events of equal significance the remoter one will be the one more likely to be forgotten. The memories of childhood which persist in old age can hardly be compared with the events of the day or hour which are forgotten, for these latter are trivial once-repeated things, whilst the childish reminiscences have been wrought into us during the retrospective hours of our entire intervening life. *Other things equal*, at all times of life recency promotes memory. The only exception I can think of is the unaccountable memory of certain moments of our childhood, apparently not fitted by their intrinsic interest to survive, but which are perhaps the only incidents we can remember out of the year in which they occurred. Everybody probably has isolated glimpses of certain hours of his nursery life, the position in which he stood or sat, the light of the room, what his father or mother said, etc. These moments so oddly selected for immunity from the tooth of time probably owe their good fortune to historical peculiarities which it is now impossible to trace. Very likely we were reminded of them again soon after they occurred; that became a reason why we should again recollect them, etc., so that at last they became ingrained.

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The *attention* which we lend to an experience is proportional to its vivid or interesting character; and it is a notorious fact that what interests us most vividly at the time is, other things equal, what we remember best. An impression may be so exciting emotionally as almost to leave a *scar* upon the cerebral tissues; and thus originates a pathological delusion. "A woman attacked by robbers takes all the men whom she sees, even her own son, for brigands bent on killing her. Another woman sees her child run over by a horse; no amount of reasoning, not even the sight of the living child, will persuade her that he is not killed. A

woman called 'thief' in a dispute remains convinced that every one accuses her of stealing (Esquirol). Another, attacked with mania at the sight of the fires in her street during the Commune, still after six months sees in her delirium flames on every side about her (Luys), etc., etc."^[593]

On the general effectiveness of both attention and repetition I cannot do better than copy what M. Taine has written:

"If we compare different sensations, images, or ideas, we find that their aptitudes for revival are not equal. A large number of them are obliterated, and never reappear through life; for instance, I drove through Paris a day or two ago, and though I saw plainly some sixty or eighty new faces, I cannot now recall any one of them; some extraordinary circumstance, a fit of delirium, or the excitement of haschish would be necessary to give them a chance of revival. On the other hand, there are sensations with a force of revival which nothing destroys or decreases. Though, as a rule, time weakens and impairs our strongest sensations, these reappear entire and intense, without having lost a particle of their detail, or any degree of their force. M. Brierre de Boismont, having suffered when a child from a disease of the scalp, asserts that 'after fifty-five years have elapsed he can still feel his hair pulled out under the treatment of the *skull-cap*.'—For my own part, after thirty years, I remember feature for feature the appearance of the theatre to which I was taken for the first time. From the third row of boxes, the body of the theatre appeared to me an immense well, red and flaming, swarming with heads; below, on the right, on a narrow floor, two men and a woman entered, went out, and re-entered, made gestures, and seemed to me like lively dwarfs: to my great surprise, one of these dwarfs fell on his knees, kissed the lady's hand, then hid behind a screen; the other, who was coming in, seemed angry, and raised his arm. I was then seven, I could understand nothing of what was going on; but the well of crimson velvet was so crowded, gilded, and bright, that after a quarter of an hour I was, as it were, intoxicated, and fell asleep.

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"Every one of us may find similar recollections in his memory, and may distinguish in them a common character. The primitive impression has been accompanied by *an extraordinary degree of attention*, either as being horrible or delightful, or as being new, surprising, and out of proportion to the ordinary run of our life; this it is we express by saying that we have been strongly impressed; that we were absorbed, that we could not think of anything else; that our other sensations were effaced; that we were pursued all the next day by the resulting image; that it beset us, that we could not drive it away; that all distractions were feeble beside it. It is by force of this disproportion that impressions of childhood are so persistent; the mind being quite fresh, ordinary objects and events are surprising. At present, after seeing so many large halls and full theatres, it is impossible for me, when I enter one, to feel swallowed up, engulfed, and, as it were, lost in a huge dazzling well. The medical man of sixty, who has experienced much suffering, both personally and in imagination, would be less upset now by a surgical operation than when he was a child.

"Whatever may be the kind of attention, voluntary or involuntary, it always acts alike; the image of an object or event is capable of revival, and of complete revival, in proportion to the degree of attention with which we have considered the object or event. We put this rule in practice at every moment in ordinary life. If we are applying ourselves to a book or are in lively conversation, while an air is being sung in the adjoining room, we do not retain it; we know vaguely that there is singing going on, and that is all. We then stop our reading or conversation, we lay aside all internal preoccupations and external sensations

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which our mind or the outer world can throw in our way; we close our eyes, we cause a silence within and about us, and, if the air is repeated, we listen. We say then that we have listened with all our ears, that we have applied our whole minds. If the air is a fine one, and has touched us deeply, we add that we have been transported, uplifted, ravished, that we have forgotten the world and ourselves; that for some minutes our soul was dead to all but sounds....

"This exclusive momentary ascendancy of one of our states of mind explains the greater durability of its aptitude for revival and for more complete revival. As the sensation revives in the image, the image reappears with a force proportioned to that of the sensation. What we meet with in the first state is also to be met with in the second, since the second is but a revival of the first. So, in the struggle for life, in which all our images are constantly engaged, the one furnished at the outset with most force retains in each conflict, by the very law of repetition which gives it being, the capacity of treading down its adversaries; this is why it revives, incessantly at first, then frequently, until at last the laws of progressive decay, and the continual accession of new impressions take away its preponderance, and its competitors, finding a clear field, are able to develop in their turn.

"A second cause of prolonged revivals is repetition itself. Every one knows that to learn a thing we must not only consider it attentively, but consider it repeatedly. We say as to this in ordinary language, that an impression many times renewed is imprinted more deeply and exactly on the memory. This is how we contrive to retain a language, airs of music, passages of verse or prose, the technical terms and propositions of a science, and still more so the ordinary facts by which our conduct is regulated. When, from the form and color of a currant-jelly, we think of its taste, or, when tasting it with our eyes shut, we imagine its red tint and the brilliancy of a quivering slice, the images in our mind are brightened by repetition. Whenever we eat, or drink, or walk, or avail ourselves of any of our senses, or commence or continue any action whatever, the same thing happens. Every man and every animal thus possesses at every moment of life a certain stock of clear and easily reviving images, which had their source in the past in a confluence of numerous experiences, and are now fed by a flow of renewed experiences. When I want to go from the Tuileries to the Panthéon, or from my study to the dining-room, I foresee at every turn the colored forms which will present themselves to my sight; it is otherwise in the case of a house where I have spent two hours, or of a town where I have stayed three days; after ten years have elapsed the images will be vague, full of blanks, sometimes they will not exist, and I shall have to seek my way or shall lose myself.—This new property of images is also derived from the first. As every sensation tends to revive in its image, the sensation twice repeated will leave after it a double tendency, that is, provided the attention be as great the second time as the first; usually this is not the case, for, the novelty diminishing, the interest diminishes; but if other circumstances renew the interest, or if the will renovates the attention, the incessantly increasing tendency will incessantly increase the chances of the resurrection and integrity of the image."^[594]

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If a phenomenon is met with, however, too often, and with too great a variety of contexts, although its image is retained and reproduced with correspondingly great facility, it fails to come up with any one particular setting, and the projection of it backwards to a particular past date consequently does not come about. We *recognize* but do not *remember* it—its associates form too confused a cloud. No one is said to remember, says Mr. Spencer,

"that the object at which he looks has an opposite side; or that a certain modification of the visual impression implies a certain distance; or that the thing he sees moving about is a live animal. To ask a man whether he remembers that the sun shines, that fire burns, that iron is hard, would be a misuse of language. Even the almost fortuitous connections among our experiences cease to be classed as memories when they have become thoroughly familiar. Though, on hearing the voice of some unseen person slightly known to us, we say we recollect to whom the voice belongs, we do not use the same expression respecting the voices of those with whom we live. The meanings of words which in childhood have to be consciously recalled seem in adult life to be immediately present."^[595]

These are cases where too many paths, leading to too diverse associates, block each other's way, and all that the mind gets along with its object is a fringe of felt familiarity or sense that there *are* associates. A similar result comes about when a definite setting is only nascently aroused. We then feel that we have seen the object already, but when or where we cannot say, though we may seem to ourselves to be on the brink of saying it. That nascent cerebral excitations can effect consciousness with a sort of sense of the imminence of that which stronger excitations would make us definitely feel, is obvious from what happens when we seek to remember a name. It tingles, it trembles on the verge, but does not come. Just such a tingling and trembling of unrecovered associates is the penumbra of recognition that may surround any experience and make it seem familiar, though we know not why.^[596]

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There is a curious experience which everyone seems to have had—the feeling that the present moment in its completeness has been experienced before—we were saying just this thing, in just this place, to just these people, etc. This 'sense of pre-existence' has been treated as a great mystery and occasioned much speculation. Dr. Wigan considered it due to a dissociation of the action of the two hemispheres, one of them becoming conscious a little later than the other, but both of the same fact.^[597] I must confess that the quality of mystery seems to me a little strained. I have over and over again in my own case succeeded in resolving the phenomenon into a case of memory, so indistinct that whilst some past circumstances are presented again, the others are not. The dissimilar portions of the past do not arise completely enough at first for the date to be identified, All we get is the present scene with a general suggestion of pastness about it. That faithful observer, Prof. Lazarus, interprets the phenomenon in the same way,^[598] and it is noteworthy that just as soon as the past context grows complete and distinct the emotion of weirdness fades from the experience.

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EXACT MEASUREMENTS OF MEMORY

have recently been made in Germany. Professor Ebbinghaus, in a really heroic series of daily observations of more than two years' duration, examined the powers of retention and reproduction. He learned lists of meaningless syllables by heart, and tested his recollection of them from day to day. He could not remember more than 7 after a single reading. It took, however, 16 readings to remember 12, 44 readings to remember 24, and 55 readings to remember 26 syllables, the moment of 'remembering' being here reckoned as the first moment when the list could be recited without a fault.^[599] When a 16-syllable list was read over a certain number of times on one day, and then studied on the day following until remembered, it was found that the number of seconds saved in the study on the second day was proportional to the number of readings on the first—proportional, that is, within certain rather narrow limits, for which see the text.^[600] No amount of repetition spent on nonsense-verses over a certain length enabled Dr. Ebbinghaus to retain them without error for 24 hours. In forgetting such things as these lists of syllables, the loss goes on very much more

rapidly at first than later on. He measured the loss by the number of seconds required to *relearn* the list after it had been once learned. Roughly speaking, if it took a thousand seconds to learn the list, and five hundred to relearn it, the loss between the two learnings would have been one half. Measured in this way, full half of the forgetting seems to occur within the first half-hour, whilst only four fifths is forgotten at the end of a month. The nature of this result might have been anticipated, but hardly its numerical proportions. Dr. Ebbinghaus says:

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"The initial rapidity, as well as the final slowness, as these were ascertained under certain experimental conditions and for a particular individual,... may well surprise us. An hour after the work of learning had ceased, forgetting was so far advanced that more than half of the original work had to be applied again before the series of syllables could once more be reproduced. Eight hours later two thirds of the original labor had to be applied. Gradually, however, the process of oblivion grew slower, so that even for considerable stretches of time the losses were but barely ascertainable. After 24 hours a third, after 6 days a fourth, and after a whole month a good fifth of the original labor remain in the shape of its after-effects, and made the relearning by so much the more speedy."

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But the most interesting result of all those reached by this author relates to the question whether ideas are recalled only by those that previously came immediately before them, or whether an idea can possibly recall another idea with which it was never in *immediate* contact, without passing through the intermediate mental links. The question is of theoretic importance with regard to the way in which the process of 'association of ideas' must be conceived; and Dr. Ebbinghaus's attempt is as successful as it is original, in bringing two views, which seem at first sight inaccessible to proof, to a direct practical test, and giving the victory to one of them. His experiments conclusively show that an idea is not only 'associated' directly with the one that follows it, and with the rest *through that*, but that it is *directly* associated with *all* that are near it, though in unequal degrees. He first measured the time needed to impress on the memory certain lists of syllables, and then the time needed to impress lists of the same syllables with gaps between them. Thus, representing the syllables by numbers, if the first list were 1, 2, 3, 4,... 13, 14, 15, 16, the second would be 1, 3, 5,... 15, 2, 4, 6,... 16, and so forth, with many variations.

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Now, if 1 and 3 in the first list were learned in that order merely by 1 calling up 2, and by 2 calling up 3, leaving out the 2 ought to leave 1 and 3 with no tie in the mind; and the second list ought to take as much time in the learning as if the first list had never been heard of. If, on the other hand, 1 has a *direct* influence on 3 as well as on 2, that influence should be exerted even when 2 is dropped out; and a person familiar with the first list ought to learn the second one more rapidly than otherwise he could. This latter case is what actually occurs; and Dr. Ebbinghaus has found that syllables originally separated by as many as seven intermediaries still reveal, by the increased rapidity with which they are learned in order, the strength of the tie that the original learning established between them, over the heads, so to speak, of all the rest. These last results ought to make us careful, when we speak of nervous 'paths,' to use the word in no restricted sense. They add one more fact to the set of facts which prove that association is subtler than consciousness, and that a nerve-process may, without producing consciousness, be effective in the same way in which consciousness would have seemed to be effective if it had been there.^[602] Evidently the path from 1 to 3 (omitting 2 from consciousness) is facilitated, broadened perhaps, by the old path from 1 to 3 through 2—only the component which shoots round through this latter way is too feeble to let 2 be thought as a distinct object.

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Mr. Wolfe, in his experiments on recognition, used vibrating metal tongues.

"These tongues gave tones differing by 2 vibrations only in the two lower octaves, and by 4 vibrations in the three higher octaves. In the first series of experiments a tone was selected, and, after sounding it for one second, a second tone was sounded, which was either the same as the first, or different from it by 4, 8, or 12 vibrations in different series. The person experimented upon was to answer whether the second tone was the same as the first, thus showing that he recognized it, or whether it was different, and, if so, whether it was higher or lower. Of course, the interval of time between the two tones was an important factor. The proportionate number of correct judgments, and the smallness of the difference of the vibration-rates of the two tones, would measure the accuracy of the tone-memory. It appeared that one could tell more readily when the two tones were alike than when they were different, although in both cases the accuracy of the memory was remarkably good.... The main point is the effect of the time-interval between the tone and its reproduction. This was varied from 1 second to 30 seconds, or even to 60 seconds or 120 seconds in some experiments. The general result is, that the longer the interval, the smaller are the chances that the tone will be recognized; and this process of forgetting takes place at first very rapidly, and then more slowly.... This law is subject to considerable variations, one of which seems to be constant and is peculiar; namely, there seems to be a rhythm in the memory itself, which, after falling, recovers slightly, and then fades out again."^[603]

This periodical renewal of acoustic memory would seem to be an important element in the production of the agreeableness of certain rates of recurrence in sound.

FORGETTING.

In the practical use of our intellect, forgetting is as important a function as recollecting.

Locke says, in a memorable page of his dear old book:

"The memory of some men, it is true, is very tenacious, even to a miracle; but yet there seems to be a constant decay of all our ideas, even of those which are struck deepest, and in minds the most retentive: so that if they be not sometimes renewed by repeated exercise of the senses, or reflection on those kinds of objects which at first occasioned them, the print wears out, and at last there remains nothing to be seen. Thus the ideas, as well as children, of our youth, often die before us; and our minds represent to us those tombs to which we are fast approaching; where, though the brass and marble remain, yet the inscriptions are effaced by time, and the imagery moulders away. The pictures drawn in our minds are laid in fading colors; and, if not sometimes refreshed, vanish and disappear. How much the constitution of our bodies, and the make of our animal spirits, are concerned in this; and whether the temper of the brain makes this difference, that in some it retains the characters drawn on it like marble, in others like freestone, and in others little better than sand, I shall not here inquire, though it may seem probable that the constitution of the body does sometimes influence the memory; since we oftentimes find a disease quite strip the mind of all its ideas, and the flames of a fever in a few days calcine all those images to dust and confusion, which seemed to be as lasting as if graven in marble."^[604]

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This peculiar mixture of forgetting with our remembering is but one instance of our mind's selective activity. Selection is the very keel on which our mental ship is built. And in this case of memory its utility is obvious. If we remembered everything, we should on most occasions be as ill off as if we remembered nothing. It would take as long for us to recall a space of time as it took the original time to elapse, and we should never get ahead with our thinking. All recollected times undergo, accordingly, what M. Ribot calls foreshortening; and this foreshortening is due to the omission of an enormous number of the facts which filled them.

"As fast as the present enters into the past, our states of consciousness disappear and are obliterated. Passed in review at a few days' distance, nothing or little of them remains: most of them have made shipwreck in that great nonentity from which they never more will emerge, and they have carried with them the quantity of duration which was inherent in their being. This deficit of surviving conscious states is thus a deficit in the amount of represented time. The process of abridgment, of foreshortening, of which we have spoken, presupposes this deficit. If, in order to reach a distant reminiscence, we had to go through the entire series of terms which separate it from our present selves, memory would become impossible on account of the length of the operation. We thus reach the paradoxical result that one condition of remembering is that we should forget. Without totally forgetting a prodigious number of states of consciousness, and momentarily forgetting a large number, we could not remember at all. Oblivion, except in certain cases, is thus no malady of memory, but a condition of its health and its life."^[605]

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There are many irregularities in the process of forgetting which are as yet unaccounted for. A thing forgotten on one day will be remembered on the next. Something we have made the most strenuous efforts to recall, but all in vain, will, soon after we have given up the attempt, saunter into the mind, as Emerson somewhere says, as innocently as if it had never been sent for. Experiences of bygone date will revive after years of absolute oblivion, often as the result of some cerebral disease or accident which seems to develop latent paths of association, as the photographer's fluid develops the picture sleeping in the collodion film. The oftenest quoted of these cases is Coleridge's:

"In a Roman Catholic town in Germany, a young woman, who could neither read nor write, was seized with a fever, and was said by the priests to be possessed of a devil, because she was heard talking Latin, Greek, and Hebrew. Whole sheets of her ravings were written out, and found to consist of sentences intelligible in themselves, but having slight connection with each other. Of her Hebrew sayings, only a few could be traced to the Bible, and most seemed to be in the Rabbinical dialect. All trick was out of the question; the woman was a simple creature; there was no doubt as to the fever. It was long before any explanation, save that of demoniacal possession, could be obtained. At last the mystery was unveiled by a physician, who determined to trace back the girl's history, and who, after much trouble, discovered that at the age of nine she had been charitably taken by an old Protestant pastor, a great Hebrew scholar, in whose house she lived till his death. On further inquiry it appeared to have been the old man's custom for years to walk up and down a passage of his house into which the kitchen opened, and to read to himself with a loud voice out of his books. The books were ransacked, and among them were found several of the Greek and Latin Fathers, together with a collection of Rabbinical writings. In these works so many of the passages taken down at the young woman's bedside were identified that there could be no reasonable doubt as to their source."^[606]

Hypnotic subjects as a rule forget all that has happened in their trance. But in a succeeding trance they will often remember the events of a past one. This is like what happens in those cases of 'double personality' in which no recollection of one of the lives is to be found in the other. We have already seen in an earlier chapter that the sensibility often differs from one of the alternate personalities to another, and we have heard M. Pierre Janet's theory that anæsthesias carry amnesias with them (see above, [pp. 385](#) ff.). In certain cases this is evidently so; the throwing of certain functional brain-tracts out of gear with others, so as to dissociate their consciousness from that of the remaining brain, throws them out for both sensorial and ideational service. M. Janet proved in various ways that what his patients forgot when anæsthetic they remembered when the sensibility returned. For instance, he restored their tactile sense temporarily by means of electric currents, passes, etc., and then made them handle various objects, such as keys and pencils, or make particular movements, like the sign of the cross. The moment the anæsthesia returned they found it impossible to recollect the objects or the acts. 'They had had nothing in their hands, they had done nothing,' etc. The next day, however, sensibility being again restored by similar processes, they remembered perfectly the circumstance, and told what they had handled or had done.

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All these pathological facts are showing us that the sphere of possible recollection may be wider than we think, and that in certain matters apparent oblivion is no proof against possible recall under other conditions. They give no countenance, however, to the extravagant opinion that nothing we experience can be absolutely forgotten. In real life, in spite of occasional surprises, most of what happens actually is forgotten. The only reasons for supposing that if the conditions were forthcoming everything would revive are of a transcendental sort. Sir Wm. Hamilton quotes and adopts them from the German writer Schmid. Knowledge being a 'spontaneous self-energy' on the part of the mind,

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"this energy being once determined, it is natural that it should persist, until again annihilated by other causes. This [annihilation] would be the case, were the mind merely passive.... But the mental activity, the act of knowledge, of which I now speak, is more than this; it is an energy of the self-active power of a subject one and indivisible: consequently a part of the ego must be detached or annihilated, if a cognition once existent be again extinguished. Hence it is that the problem most difficult of solution is not, how a mental activity endures, but how it ever vanishes."^[607]

Those whom such an argument persuades may be left happy with their belief. Other positive argument there is none, none certainly of a physiological sort.^[608]

When memory begins to decay, proper names are what go first, and at all times proper names are harder to recollect than those of general properties and classes of things.

This seems due to the fact that common qualities and names have contracted an infinitely greater number of associations in our mind than the names of most of the persons whom we know. Their memory is better organized. Proper names as well organized as those of our family and friends are recollected as well as those of any other objects.^[609] 'Organization' means numerous associations; and the more numerous the associations, the greater the number of paths of recall. For the same reason adjectives, conjunctions, prepositions, and the cardinal verbs, those words, in short, which form the grammatical framework of all our speech, are the very last to decay. Kussmaul^[610] makes the following acute remark on this subject:

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"The concreter a conception is, the sooner is its name forgotten. This is because our ideas of persons and things are less strongly bound up with their names than with such abstractions as their business, their circumstances, their qualities. We easily can imagine persons and things without their names, the sensorial image of them being more important than that other symbolic image, their name. Abstract conceptions, on the other hand, are only acquired by means of the words which alone serve to confer stability upon them. This is why verbs, adjectives, pronouns, and still more adverbs, prepositions, and conjunctions are more intimately connected with our thinking than are substantives."

The disease called Aphasia, of which a little was said in [Chapter II](#), has let in a flood of light on the phenomenon of Memory, by showing the number of ways in which the use of a given object, like a word, may be lost by the mind. We may lose our acoustic idea or our articulatory idea of it; neither without the other will give us proper command of the word. And if we have both, but have lost the paths of association between the brain-centres which support the two, we are in as bad a plight. 'Ataxic' and 'amnesic' aphasia, 'word-deafness,' and 'associative aphasia' are all practical losses of word-memory. We have thus, as M. Ribot says, not memory so much as memories.^[611] The visual, the tactile, the muscular, the auditory memory may all vary independently of each other in the same individual; and different individuals may have them developed in different degrees. As a rule, a man's memory is good in the departments in which his interest is strong; but those departments are apt to be those in which his discriminative sensibility is high. A man with a bad ear is not likely to have practically a good musical memory, or a purblind person to remember visual appearances well. In a later chapter we shall see illustrations of the differences in men's imagining power.^[612] It is obvious that the machinery of memory must be largely determined thereby.

Mr. Galton, in his work on English Men of Science,^[613] has given a very interesting collation of cases showing individual variations in the type of memory, where it is strong. Some have it verbal. Others have it good for facts and figures, others for form. Most say that what is to be remembered must first be rationally conceived and assimilated.^[614]

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There is an interesting fact connected with remembering, which, so far as I know, Mr. R. Verdon was the first writer expressly to call attention to. We can *set* our memory as it were to retain things for a certain time, and then let them depart.

"Individuals often remember clearly and well up to the time when they have to use their knowledge, and then, when it is no longer required, there follows a rapid and extensive decay of the traces. Many schoolboys forget their lessons after they have said them, many barristers forget details got up for a particular case. Thus a boy learns thirty lines of Homer, says them perfectly, and then forgets them so that he could not say five consecutive lines the next morning, and a barrister may be one week learned in the mysteries of making cog-wheels, but in the next he may be well acquainted with the anatomy of the ribs instead."^[615]

The rationale of this fact is obscure; and the existence of it ought to make us feel how truly subtle are the nervous processes which memory involves. Mr. Verdon adds that

"When the use of a record is withdrawn, and attention withdrawn from it, and we think no more about it, we know that we experience a feeling of relief, and

we may thus conclude that energy is in some way liberated. If the ... attention is not withdrawn, so that we keep the record in mind, we know that this feeling of relief does not take place.... Also we are well aware, not only that after this feeling of relief takes place, the record does not seem so well conserved as before, but that we have real difficulty in attempting to remember it."

This shows that we are not as entirely unconscious of a topic as we think, during the time in which we seem to be merely retaining it subject to recall.

"Practically," says Mr. Verdon, "we sometimes keep a matter in hand not exactly by attending to it, but by keeping our attention referred to something connected with it from time to time. Translating this into the language of physiology, we mean that by referring attention to a part within, or closely connected with, the system of traces [paths] required to be remembered, we keep it well fed, so that the traces are preserved with the utmost delicacy."

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This is perhaps as near as we can get to an explanation. Setting the mind to remember a thing involves a continual minimal irradiation of excitement into paths which lead thereto, involves the continued presence of the thing in the 'fringe' of our consciousness. Letting the thing go involves withdrawal of the irradiation, unconsciousness of the thing, and, after a time, obliteration of the paths.

A curious peculiarity of our memory is that things are impressed better by active than by passive repetition. I mean that in learning by heart (for example), when we almost know the piece, it pays better to wait and recollect by an effort from within, than to look at the book again. If we recover the words in the former way, we shall probably know them the next time; if in the latter way, we shall very likely need the hook once more.

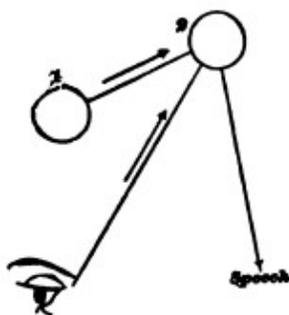


FIG. 46.

The learning by heart means the formation of paths from a former set to a later set of cerebral word-processes: call 1 and 2 in the diagram the processes in question; then when we remember by inward effort, the path is formed by discharge from 1 to 2, just as it will afterwards be used. But when we excite 2 by the eye, although the path 1—2 doubtless is then shot through also, the phenomenon which we are discussing shows that the direct discharge from 1 into 2, unaided by the eyes, ploughs the deeper and more permanent groove. There is, moreover, a greater amount of tension accumulated in the brain before the discharge from 1 to 2, when the latter takes place unaided by the eye. This is proved by the general feeling of strain in the effort to remember 2; and this also ought to make the discharge more violent and the path

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more deep. A similar reason doubtless accounts for the familiar fact that we remember our own theories, our own discoveries, combinations, inventions, in short whatever 'ideas' originate in our own brain, a thousand times better than exactly similar things which are communicated to us from without.

A word, in closing, about the metaphysics involved in remembering. According to the assumptions of this book, thoughts accompany the brain's workings, and those thoughts are cognitive of realities. The whole relation is one which we can only write down empirically, confessing that no glimmer of explanation of it is yet in sight. That brains should give rise to a knowing consciousness at all, this is the one mystery which returns, no matter of what sort the consciousness and of what sort the knowledge may be. Sensations, aware of mere qualities, involve the mystery as much as thoughts, aware of complex systems, involve it. To the platonizing tradition in philosophy, however, this is not so. Sensational consciousness is something *quasi-material*, hardly cognitive, which one need not much wonder at. *Relating* consciousness is quite the reverse, and the mystery of it is unspeakable. Professor Ladd, for

example, in his usually excellent book,^[616] after well showing the matter-of-fact dependence of retention and reproduction on brain-paths, says:

"In the study of perception psycho-physics *can* do much towards a scientific explanation. It can tell what qualities of stimuli produce certain qualities of sensations, it can suggest a principle relating the quantity of the stimuli to the intensity of the sensation; it can investigate the laws under which, by combined action of various excitations, the *sensations are combined* [?] into presentations of sense; it can show how the time-relations of the sensations and percepts in consciousness correspond to the objective relations in time of the stimulations. But for that spiritual activity which actually *puts together* in consciousness the sensations, it cannot even suggest the beginning of a physical explanation. Moreover, no cerebral process can be conceived of, which—in case it were known to exist—could possibly be regarded as a fitting basis for this unifying *actus* of mind. Thus also, and even more emphatically, must we insist upon the complete inability of physiology to suggest an explanation for conscious memory, in so far as it is *memory*—that is, in so far as it most imperatively calls for explanation.... The very essence of the act of memory consists in the ability to say: This after-image is the image of a percept I had a moment since; or this image of memory is the image of the percept I had at a certain time—I do not remember precisely how long since. It would, then, be quite contrary to the facts to hold that, when an image of memory appears in consciousness, it is recognized as belonging to a particular original percept on account of its perceived resemblance to this percept. The original percept does not exist and will never be *reproduced*. Even more palpably false and absurd would it be to hold that any similarity of the impressions or processes in end organs or central organs explains the act of conscious memory. Consciousness knows nothing of such similarity; knows nothing even of the existence of nervous impressions and processes. Moreover, we could never *know* two impressions or processes that are separated in time to be similar, without involving the same inexplicable act of memory. It is a fact of consciousness on which all possibility of connected experience and of recorded and cumulative human knowledge is dependent that certain phases or products of consciousness appear with a claim to stand for (to represent)^[617] past experiences to which they are regarded as in some respect similar. It is this peculiar claim in consciousness which constitutes the essence of an act of memory; it is this which makes the memory wholly inexplicable as a mere persistence or recurrence of similar impressions. It is this which makes conscious memory a spiritual phenomenon, the explanation of which, as arising out of nervous processes and conditions, is not simply undiscovered in fact, but utterly incapable of approach by the imagination. When, then, we speak of a physical basis of memory, recognition must be made of the complete inability of science to suggest any physical process which can be conceived of as correlated with that peculiar and mysterious *actus* of the mind, *connecting* its present and its past, which constitutes the essence of memory."

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This passage seems to me characteristic of the reigning half-way modes of thought. It puts the difficulties in the wrong places. At one moment it seems to admit with the cruder sensationalists that the material of our thoughts is independent sensations reproduced, and that the 'putting together' of these sensations would be knowledge, if it could only be brought about, the only mystery being as to the what '*actus*' can bring it about. At another moment it seems to contend that even this sort of 'combining' would not be knowledge, because certain of the elements connected must 'claim to represent or stand for' past originals, which is incompatible with their being mere images revived. The result is various

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confused and scattered mysteries and unsatisfied intellectual desires. But why not 'pool' our mysteries into one great mystery, the mystery that brain-processes occasion knowledge at all? It is surely no different mystery to *feel* myself by means of one brain-process writing at this table now, and by means of a different brain-process a year hence to *remember* myself writing. All that psychology can do is to seek to determine *what* the several brain-processes are; and this, in a wretchedly imperfect way, is what such writings as the present chapter have begun to do. But of 'images reproduced,' and 'claiming to represent,' and 'put together by a unifying *actus*,' I have been silent, because such expressions either signify nothing, or they are only roundabout ways of simply saying that the *past is known* when certain brain-conditions are fulfilled, and it seems to me that the straightest and shortest way of saying that is the best.

For a history of opinion about Memory, and other bibliographic references, I must refer to the admirable little monograph on the subject by Mr. W. H. Burnham in the American Journal of Psychology, vols. i and ii. Useful books are: D. Kay's Memory, What It Is, and How to Improve It (1888); and F. Fauth's Das Gedächtniss, Studie zu einer Pädagogik, etc., 1888.

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[567] L'Homme et l'Intelligence, p. 32.

[568] Professor Richet has therefore no right to say, as he does in another place (Revue Philosophique, xxi, 570): "*Without memory no conscious sensation, without memory no consciousness.*" All he is entitled to say is: "Without memory no consciousness known outside of itself." Of the sort of consciousness that is an object for later states, and becomes as it were permanent, he gives a good example: "Who of us, alas! has not experienced a bitter and profound grief, the immense laceration cause by the death of some cherished fellow-being? Well, in these great griefs the present endures neither for a minute, for an hour, nor for a day, but for weeks and months. The memory of the cruel moment will not efface itself from consciousness. It disappears not, but remains living, present, coexisting with the multitude of other sensations which are juxtaposed in consciousness alongside of this one persistent emotion which is felt always in the present tense. A long time is needed ere we can attain to forgetting it, ere we can make it enter into the past. *Hæret lateri letalis arundo.*" (*Ibid.* 583.)

[569] This is the primary positive after-image. According to Helmholtz, one third of a second is the most favorable length of exposure to the light for producing it. Longer exposure, complicated by subsequent admission of light to the eye, results in the ordinary negative and complementary after-images, with their changes, which may (if the original impression was brilliant and the fixation long) last for many minutes. Fechner gives the name of memory-after-images (Psychophysik, ii, 492) to the instantaneous positive effects, and distinguishes them from ordinary after images by the following characters: 1) Their originals must have been *attended to*, only such parts of a compound original as have been attended to appearing. This is not the case in common visual after-images. 2) The strain of attention towards them is inward, as in ordinary remembering, not outward, as in observing a common after-image. 3) A short fixation of the original is better for the memory-after-image, a long one for the ordinary after-image. 4) The colors of the memory-after-image are never complementary of those of the original.

[570] Hermann's Hdbch. ii, 2. 282.

[571] Rev. Philos., 562.

- [572] Richet says: "The present has a certain duration, a variable duration, sometimes a rather long one, which comprehends all the time occupied by the after-reverberation [*retentissement*, after-image] of a sensation. For example, if the reverberation of an electric shock within our nerves lasts ten minutes, for that electric shock there is a present of ten minutes. On the other hand, a feebler sensation will have a shorter present. But in every case, for a conscious sensation [I should say for a *remembered* sensation] to occur, there must be a present of a certain duration, of a few seconds at least." We have seen in the last chapter that it is hard to trace the backward limits of this immediately intuited duration, or specious present. The figures which M. Richet supposes appear to be considerably too large.
- [573] Cf. Fechner, *Psychophysik*, ii, 499.
- [574] The primary after-image itself cannot be utilized if the stimulus is too brief. Mr. Cattell found (*Psychologische Studien*, iii, p. 93 ff.) that the color of a light must fall upon the eye for a period varying from 0.00275 to 0.006 of a second, in order to be recognized for what it is. Letters of the alphabet and familiar words require from 0.00075 to 0.00175 sec.—truly an interval extremely short. Some letters, E for example, are harder than others. In 1871 Helmholtz and Baxt had ascertained that when an impression was immediately followed by another, the latter quenched the former and prevented it from being known to later consciousness. The first stimulus was letters of the alphabet, the second a bright white disk. "With an interval of 0.0048 sec. between the two excitations [I copy here the abstract in Ladd's *Physiological Psychology*, p. 480], the disk appeared as scarcely a trace of a weak shimmer; with an interval of 0.0096 sec., letters appeared in the shimmer—one or two which could be partially recognized when the interval increased to 0.0144 sec. When the interval was made 0.0192 sec. the objects were a little more clearly discerned; at 0.00336 sec. four letters could be well recognized; at 0.0432 sec., five letters; and at 0.0528 sec. all the letters could be read." (*Pflüger's Archiv*, iv, 325 ff.)
- [575] When the past is recalled symbolically, or conceptually only, it is true that no such copy need be there. In no sort of conceptual knowledge is it requisite that definitely resembling images be there (cf. [pp. 471](#) ff.). But as all conceptual knowledge stands for intuitive knowledge, and terminates therein, I abstract from this complication, and confine myself to those memories in which the past is directly imaged in the mind, or, as we say, intuitively known.
- [576] E.g. Spencer, *Psychology*, i, p. 448. How do the believers in the sufficiency of the 'image' formulate the cases where we remember that something did *not* happen—that we did not wind our watch, did not lock the door, etc.? It is very hard to account for these memories of omission. The image of winding the watch is just as present to my mind now when I remember that I did not wind it as if I remembered that I did. It must be a difference in the mode of feeling the image which leads me to such different conclusions in the two cases. When I remember that I did wind it, I feel it grown together with its associates of past date and place. When I remember that I did not, it keeps aloof; the associates fuse with each other, but not with it. This sense of fusion, of the belonging together of things, is a most subtle relation; the sense of non-fusion is an equally subtle one. Both relations demand most complex mental processes to know them, processes quite different from that mere presence or absence of an image which does such service in the cruder books.
- [577] *Psychologia Empirica*, § 174.
- [578] *Analysis*, i, 330-1. Mill believed that the various things remembered, the self included, enter consciousness in the form of separate ideas, but so rapidly that they are 'all clustered into one.' "Ideas called up in close conjunction ... assume, even when there is the greatest complexity, the appearance, not of many ideas, but

of one" (vol. i, p. 123). This mythology does not impair the accuracy of his description of memory's *object*.

- [579] Compare, however, [p. 251](#), Chapter IX.
- [580] Professor Bain adds, in a note to this passage of Mill's: "This process seems best expressed by laying down a law of Compound or Composite Association, under which a plurality of feeble links of connection may be a substitute for one powerful and self-sufficing link."
- [581] Analysis, chap. x.
- [582] H. Maudsley, *The Physiology of Mind* (London, 1876), p. 513.
- [583] The only fact which might plausibly be alleged against this view is the familiar one that we may feel the lapse of time in an experience so monotonous that its earlier portions can have no 'associates' different from its later ones. Sit with closed eyes, for example, and steadily pronounce some vowel-sound, thus, *a— a— a— a— a—* ... thinking only of the sound. Nothing changes during the time occupied by the experiment, and yet at the end of it you know that its beginning was far away. I think, however, that a close attention to what happens during this experiment shows that it does not violate in the least the conditions of recall laid down in the text; and that if the moment to which we mentally hark back lie many seconds behind the present instant, it always has different associates by which we define its date. Thus it was when I had just breathed out, or in; or it was the 'first moment' of the performance, the one 'preceded by silence;' or it was 'one very close to that;' or it was 'one when we were looking forward instead of back, as now;' or it is simply represented by a number and conceived symbolically with no definite image of its date. It seems to me that I have no really intuitive discrimination of the different past moments after the experience has gone on some little time, but that back of the 'specious present' they all fuse into a single conception of the *kind of thing* that has been going on, with a more or less clear sense of the total time it has lasted, this latter being based on an automatic counting of the successive pulses of thought by which the process is from moment to moment recognized as being always the same. Within the few seconds which constitute the specious present there is an intuitive perception of the successive moments. But these moments, of which we have a primary memory-image, are not properly *recalled* from the past, our knowledge of them is in no way analogous to a memory properly so called. Cf. *supra*, [p. 646](#).
- [584] On Intelligence, i, 258-9.
- [585] Not that *mere* native tenacity will make a man great. It must be coupled with great passions and great intellect besides. Imbeciles sometimes have extraordinary desultory memory. Drobisch describes (*Empirische Psychol.*, p. 95) the case of a young man whom he examined. He had with difficulty been taught to read and speak. "But if two or three minutes were allowed him to peruse an octavo page, he then could spell the single words out from his memory as well as if the book lay open before him.... That there was no deception I could test by means of a new Latin law-dissertation which had just come into my hands, which he never could have seen, and of which both subject and language were unknown to him. He read off [mentally] many lines, skipping about too, of the page which had been given him to see, no worse than if the experiment had been made with a child's story." Drobisch describes this case as if it were one of unusual persistence in the visual image ['primary memory,' *vide supra*, p. 643]. But he adds that the youth 'remembered his pages a long time.' In the *Journal of Speculative Philosophy* for Jan. 1871 (vi, 6) is an account by Mr. W. D. Henkle (together with the stock classic examples of preternatural memory) of an almost blind Pennsylvania farmer who could remember the day of the week on which any date had fallen for forty-two years past, and also the kind of weather it was, and what he was doing

on each of more than fifteen thousand days. Pity that such a magnificent faculty as this could not have found more worthy application!

What these cases show is that the mere organic retentiveness of a man need bear no definite relation to his other mental powers. Men of the highest general powers will often forget nothing, however insignificant. One of the most generally accomplished men I know has a memory of this sort. He never keeps written note of anything, yet is never at a loss for a fact which he has once heard. He remembers the old addresses of all his New York friends, living in numbered streets, addresses which they themselves have long since moved away from and forgotten. He says that he should probably recognize an individual fly, if he had seen him thirty years previous—he is, by the way, an entomologist. As an instance of his desultory memory, he was introduced to a certain colonel at a club. The conversation fell upon the signs of age in man. The colonel challenged him to estimate his age. He looked at him, and gave the exact day of his birth, to the wonder of all. But the secret of this accuracy was that, having picked up some days previously an army-register, he had idly turned over its list of names, with dates of birth, graduation, promotions, etc., attached, and when the colonel's name was mentioned to him at the club, these figures, on which he had not bestowed a moment's thought, involuntarily surged up in his mind. Such a memory is of course a priceless boon.

[586] Cf. Ebbinghaus: Ueber das Gedächtniss (1885), pp. 67, 45. One may hear a person say: "I have a very poor memory, because I was never systematically made to learn poetry at school."

[587] How to Strengthen the Memory; or, The Natural and Scientific Methods of Never Forgetting. By M. H. Holbrook, M.D. New York (no date).

[588] Page 39.

[589] Op. cit. p. 100.

[590] In order to test the opinion so confidently expressed in the text, I have tried to see whether a certain amount of daily training in learning poetry by heart will shorten the time it takes to learn an entirely different kind of poetry. During eight successive days I learned 158 lines of Victor Hugo's 'Satyr.' The total number of minutes required for this was 131 $\frac{5}{6}$ —it should be said that I had learned nothing by heart for many years. I then, working for twenty-odd minutes daily, learned the entire first book of Paradise Lost, occupying 38 days in the process. After this training I went back to Victor Hugo's poem, and found that 158 additional lines (divided exactly as on the former occasion) took me 151 $\frac{1}{2}$ minutes. In other words, I committed my Victor Hugo to memory before the training at the rate of a line in 50 seconds, after the training at the rate of a line in 57 seconds, just the opposite result from that which the popular view would lead one to expect. But as I was perceptibly fagged with other work at the time of the second batch of Victor Hugo, I thought that might explain the retardation; so I persuaded several other persons to repeat the test.

Dr. W. H. Burnham learned 16 lines of In Memoriam for 8 days; time, 14-17 minutes—daily average 14 $\frac{3}{4}$. He then trained himself on Schiller's translation of the second book of the Æneid into German, 16 lines daily for 26 consecutive days. On returning to the same quantity of In Memoriam again, he found his maximum time 20 minutes, minimum 10, average 14 $\frac{27}{48}$. As he feared the outer conditions might not have been as favorable this time as the first, he waited a few days and got conditions as near as possible identical. The result was, minimum time 8 minutes; maximum 19 $\frac{1}{2}$; average 14 $\frac{3}{48}$.

Mr. E. S. Drown tested himself on Virgil for 16 days, then again for 16 days, after training himself on Scott. Average time before training, 13 minutes 26 seconds; after training, 12 minutes 16 seconds. [Sixteen days is too long for the test, it gives time for training on the test-verse.]

Mr. C. H. Baldwin took 10 lines for 15 days as his test, trained himself on 450 lines 'of an entirely different verse,' and then took 15 days more of the former verse 10 lines a day. Average result: 3 minutes 41 seconds before, 3 minutes 2 seconds after, training. [Same criticism as before.]

Mr. E. A. Pease tested himself on Idyls of the King, and trained himself on Paradise Lost. Average result of 6 days each time: 14 minutes 34 seconds before, 14 minutes 55 seconds after, training. Mr. Burnham having suggested that to eliminate facilitating effect entirely from the training verses one ought to test one's self *à la* Ebbinghaus on series of nonsense-syllables, having no analogy whatever with any system of expressive verses, I induced two of my students to perform that experiment also. The record is unfortunately lost; but the result was a very considerable shortening of the average time of the second series of nonsense-syllables, learned after training. This seems to me, however, more to show the effects of rapid habituation to the nonsense-verses themselves than those of the poetry used between them. But I mean to prosecute the experiments farther, and will report in another place.

One of my students having quoted a clergyman of his acquaintance who had marvellously improved by practice his power of learning his sermons by heart, I wrote to the gentleman for corroboration. I append his reply, which shows that the increased facility is due rather to a change in his methods of learning than to his native retentiveness having grown by exercise: "As for memory, mine has improved year by year, except when in ill-health, like a gymnast's muscle. Before twenty it took three or four days to commit an hour-long sermon; after twenty, two days, one day, half a day, and now one slow analytic, very attentive or adhesive reading does it. But memory seems to me the most physical of intellectual powers. Bodily ease and freshness have much to do with it. Then there is a great difference of facility in method. I used to commit sentence by sentence. Now I take the idea of the whole, then its leading divisions, then its subdivisions, then its sentences."

[591] E. Pick: Memory and its Doctors (1888), p. 7.

[592] This system is carried out in great detail in a book called 'Memory Training,' by Wm. L. Evans (1889).

[593] Paulhan, L'Activité mentale, et les Éléments de l'Esprit (1889). p. 70.

[594] On Intelligence, i, 77-82.

[595] Psychology, § 201.

[596] Professor Höfding considers that the absence of contiguous associates distinctly thought-of is a proof that associative processes are not concerned in these cases of instantaneous recognition where we get a strong sense of familiarity with the object, but no recall of previous time or place. His theory of what happens is that the object before us, A, comes with a sense of familiarity whenever it awakens *a slumbering image, a, of its own past self*, whilst without this image it seems unfamiliar. The *quality of familiarity* is due to the coalescence of the two similar processes A + a in the brain (Psychologie, p. 188; Vierteljsch. f. wiss. Phil., xiii, 432 [1889]). This explanation is a very tempting one where the phenomenon of recognition is reduced to its simplest terms. Experiments have been performed in Wundt's laboratory by Messrs. Wolfe, see below, [p. 679](#), and Lehmann (Philosophische Studien, v, 96), in which a person had to tell out of several closely resembling sensible impressions (sounds, tints of color) presented, which of them was the same with one presented a moment before. And it does seem here as if the fading process in the just-excited tract must combine with the process of the new impression to give to the latter a peculiar subjective tinge which should separate it from the impressions which the other objects give. But recognition of this immediate sort is beyond our power after a very short time has intervened. A couple of minutes' interval is generally fatal to it; so that it is impossible to

conceive that our frequent instantaneous recognition of a face, e.g., as having been met before, takes place by any such simple process. Where we associate a *head of classification* with the object, the time-interval has much less effect. Dr. Lehmann could identify shades of gray much more successfully and permanently after mentally attaching names or numbers to them. Here it is the recall of the contiguous associate, the number or name, which brings about the recognition. Where an experience is complex, each element of the total object has had the other elements for its past contiguous associates. Each element thus tends to revive the other elements from within, at the same time that the outward object is making them revive from without. We have thus, whenever we meet a familiar object, that sense of *expectation gratified* which is so large a factor in our æsthetic emotions; and even were there no 'fringe of tendency' toward the arousal of *extrinsic* associates (which there certainly always is), still this *intrinsic* play of mutual association among the parts would give a character of ease to familiar percepts which would make of them a distinct subjective class. A process fills its old bed in a different way from that in which it makes a new bed. One can appeal to introspection for proof. When, for example, I go into a slaughter-house into which I once went years ago, and the horrid din of the screaming hogs strikes me with the overpowering sense of identification, when the blood-stained face of the 'sticker,' whom I had long ceased to think of, is immediately recognized as the face that struck me so before; when the dingy and reddened woodwork, the purple-flowing floor, the smell, the emotion of disgust, and *all* the details, in a word, forthwith re-establish themselves as familiar occupants of my mind; the *extraneous* associates of the past time are anything but prominent. Again, in trying to think of an engraving, say the portrait of Rajah Brooke prefixed to his biography, I can do so only partially; but when I take down the book and, looking at the actual face, am smitten with the intimate sense of its sameness with the one I was striving to resuscitate,—where in the experience is the element of *extrinsic* association? In both these cases it surely *feels* as if the moment when the sense of recall is most vivid were also the moment when all *extraneous* associates were most suppressed. The butcher's face recalls the former walls of the shambles; their thought recalls the groaning beasts, and they the face again, just as I now experience them, with no different past ingredient. In like manner the peculiar deepening of my consciousness of the Rajah's physiognomy at the moment when I open the book and say "Ah! that's the very face!" is so intense as to banish from my mind all collateral circumstances, whether of the present or of former experiences. But here it is the nose preparing tracts for the eye, the eye preparing them for the mouth, the mouth preparing them for the nose again, all these processes involving paths of contiguous association, as defended in the text. I cannot agree, therefore, with Prof. Höffding, in spite of my respect for him as a psychologist, that the phenomenon of instantaneous recognition is only explicable through the recall and comparison of the thing with its own past image. Nor can I see in the facts in question any additional ground for reinstating the general notion which we have already rejected (*supra*, p. 592) that a 'sensation' is ever received into the mind by an 'image' of its own past self. It is received by contiguous associates; or if they form too faint a fringe, its neural currents run into a bed which is still 'warm' from just-previous currents, and which consequently feel different from currents whose bed is cold. I agree, however, with Höffding that Dr. Lehmann's experiments (many of them) do not seem to prove the point which he seeks to establish. Lehmann, indeed, seems himself to believe that we recognize a sensation A by comparing it with its own past image α (*loc. cit.* p. 114), in which opinion I altogether fail to concur.

[597] Duality of the Mind, p. 84. The same thesis is defended by the late Mr. R. H. Proctor, who gives some cases rather hard to reconcile with my own proposed explanation, in 'Knowledge' for Nov. 8, 1884. See also Ribot, *Maladies de la Mémoire*, p. 149 ff.

- [598] Zeitschr. f. Völkerpsychologie u. s. w., Bd. v, p. 146.
- [599] Ueber das Gedächtniss, experimentelle Untersuchungen (1885), p. 64.
- [600] *Ibid.* § 23.
- [601] *Op. cit.* p. 103.
- [602] All the inferences for which we can give no articulate reasons exemplify this law. In the chapter on Perception we shall have innumerable examples of it. A good pathological illustration of it is given in the curious observations of M. Binet on certain hysterical subjects, with anæsthetic hands, who saw what was done with their hands as an independent vision but did not feel it. The hand being hidden by a screen, the patient was ordered to look at another screen and to tell of any visual image which might project itself thereon. Numbers would then come, corresponding to the number of times the insensible member was raised, touched, etc. Colored lines and figures would come, corresponding to similar ones traced on the palm; the hand itself, or its fingers, would come when manipulated; and, finally, objects placed in it would come; but on the hand itself nothing could ever be felt. The whole phenomenon shows how an idea which remains itself below the threshold of a certain conscious self may occasion associative effects therein. The skin-sensations, unfelt by the patient's primary consciousness, awaken, nevertheless, their usual visual associates therein.
- [603] I copy from the abstract of Wolfe's paper in 'Science' for Nov. 19, 1886. The original is in *Psychologische Studien*, iii, 534 ff.
- [604] Essay conc. Human Understanding, ii, x, 5.
- [605] Th. Ribot, *Les Maladies de la Mémoire*, p. 46.
- [606] *Biographia Literaria*, ed. 1847, i, 117 (quoted in Carpenter's *Mental Physiology*, chapter x, which see for a number of other cases, all unfortunately deficient, like this one, in the evidence of exact verification which 'psychical research' demands). Compare also Th. Ribot, *Diseases of Memory*, chap. iv. The knowledge of foreign words, etc., reported in trance mediums, etc., may perhaps often be explained by exaltation of memory. An hysterio-epileptic girl, whose case I quoted in *Proc. of Am. Soc. for Psychical Research*, automatically writes an 'Ingoldsby Legend' in several cantos, which her parents say she 'had never read.' Of course she must have read or heard it, but perhaps never *learned* it. Of some macaronic Latin-English verses about a sea-serpent which her hand also wrote unconsciously, I have vainly sought the original (see *Proc.*, etc., p. 553).
- [607] *Lectures on Metaph.*, ii, 212.
- [608] Cf. on this point J. Delbœuf, *Le Sommeil et les Rêves* (1885), p. 119 ff.; R. Verdon, *Forgetfulness*, in *Mind*, ii, 437.
- [609] Cf. A. Maury, *Le Sommeil et les Rêves*, p. 442.
- [610] *Störungen der Sprache*, quoted by Ribot, *Les Maladies de la M.*, p. 133.
- [611] *Op. cit.* chap. iii.
- [612] "Those who have a good memory for figures are in general those who know best how to handle them, that is, those who are most familiar with their relations to each other and to things." (A. Maury, *Le Sommeil et les Rêves*, p. 443.)
- [613] Pp. 107-121.
- [614] For other examples see Hamilton's *Lectures*, ii, 219, and A. Huber: *Das Gedächtniss*, p. 36 ff.
- [615] *Mind*, ii, 449.
- [616] *Physiological Psychology*, pt. ii, chap. x, § 23.
- [617] Why not say 'know'?—W. J.

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THE PRINCIPLES
OF
PSYCHOLOGY

BY
WILLIAM JAMES
PROFESSOR OF PSYCHOLOGY IN HARVARD UNIVERSITY

IN TWO VOLUMES

VOL. II.



NEW YORK
HENRY HOLT AND COMPANY

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WILLIAM JAMES

PROFESSOR OF PSYCHOLOGY IN HARVARD
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PSYCHOLOGY.

CHAPTER XVII.

SENSATION.

After inner perception, outer perception! The next three chapters will treat of the processes by which we cognize at all times the present world of space and the material things which it contains. And first, of the process called Sensation.

SENSATION AND PERCEPTION DISTINGUISHED.

The words Sensation and Perception do not carry very definitely discriminated meanings in popular speech, and in Psychology also their meanings run into each other. Both of them name processes in which we cognize an objective world; both (under normal conditions) need the stimulation of incoming nerves ere they can occur; Perception always involves Sensation as a portion of itself; and Sensation in turn never takes place in adult life without Perception also being there. They are therefore

names for different cognitive *functions*, not for different sorts of mental *fact*. The nearer the object cognized comes to being a simple quality like 'hot,' 'cold,' 'red,' 'noise,' 'pain,' apprehended irrelatively to other things, the more the state of mind approaches pure sensation. The fuller of relations the object is, on the contrary; the more it is something classed, located, measured, compared, assigned to a function, etc., etc.; the more unreservedly do we call the state of mind a perception, and the relatively smaller is the part in it which sensation plays.

Sensation, then, so long as we take the analytic point of view, differs from Perception only in the extreme simplicity of its object or content.^[1] Its function is that of mere *acquaintance* with a fact. Perception's function, on the other hand, is knowledge *about*^[2] a fact; and this knowledge admits of numberless degrees of complication. But in both sensation and perception we perceive the fact as an *immediately present outward reality*, and this makes them differ from 'thought' and 'conception,' whose objects do not appear present in this immediate physical way. *From the physiological point of view both sensations and perceptions differ from 'thoughts' (in the narrower sense of the word) in the fact that nerve-currents coming in from the periphery are involved in their production. In perception these nerve-currents arouse voluminous associative or reproductive processes in the cortex; but when sensation occurs alone, or with a minimum of perception, the accompanying reproductive processes are at a minimum too.*

I shall in this chapter discuss some general questions more especially relative to Sensation. In a later chapter perception will take its turn. I shall entirely pass by the classification and natural history of our special 'sensations,' such matters finding their proper place, and being sufficiently well treated, in all the physiological books.^[3]

THE COGNITIVE FUNCTION OF SENSATION.

A pure sensation is an abstraction; and when we adults talk of our 'sensations' we mean one of two things: either certain *objects*, namely simple *qualities* or *attributes* like *hard, hot, pain*; or else those of our thoughts in which acquaintance with these objects is least combined with knowledge about the relations of them to other things. As we can only think or talk about the relations of objects with which we have *acquaintance*

already, we are forced to postulate a function in our thought whereby we first become aware of the *bare immediate natures* by which our several objects are distinguished. This function is sensation. And just as logicians always point out the distinction between substantive terms of discourse and relations found to obtain between them, so psychologists, as a rule, are ready to admit this function, of the vision of the terms or matters meant, as something distinct from the knowledge about them and of their relations *inter se*. Thought with the former function is sensational, with the latter, intellectual. Our earliest thoughts are almost exclusively sensational. They merely give us a set of *thats*, or *its*, of subjects of discourse, with their relations not brought out. The first time we see *light*, in Condillac's phrase we *are* it rather than see it. But all our later optical knowledge is about what this experience gives. And though we were struck blind from that first moment, our scholarship in the subject would lack no essential feature so long as our memory remained. In training-institutions for the blind they teach the pupils as much *about* light as in ordinary schools. Reflection, refraction, the spectrum, the ether-theory, etc., are all studied. But the best taught born-blind pupil of such an establishment yet lacks a knowledge which the least instructed seeing baby has. They can never show him what light is in its 'first intention'; and the loss of that sensible knowledge no book-learning can replace. All this is so obvious that we usually find sensation 'postulated' as an element of experience, even by those philosophers who are least inclined to make much of its importance, or to pay respect to the knowledge which it brings.^[4]

But the trouble is that most, if not all, of those who admit it, admit it as a fractional *part* of the thought, in the old-fashioned atomistic sense which we have so often criticised.

Take the pain called toothache for example. Again and again we feel it and greet it as the same real item in the universe. We must therefore, it is supposed, have a distinct pocket for it in our mind into which it and nothing else will fit. This pocket, when filled, is the sensation of toothache; and must be either filled or half-filled whenever and under whatever form toothache is present to our thought, and whether much or little of the rest of the mind be filled at the same time. Thereupon of course comes up the paradox and mystery: If the knowledge of toothache be pent up in this separate mental pocket, how can it be known *cum alio* or brought into one

view with anything else? This pocket knows nothing else; no other part of the mind knows toothache. The knowing of toothache *cum alio* must be a miracle. And the miracle must have an Agent. And the Agent must be a Subject or Ego 'out of time,'—and all the rest of it, as we saw in Chapter X. And then begins the well-worn round of recrimination between the sensationalists and the spiritualists, from which we are saved by our determination from the outset to accept the psychological point of view, and to admit knowledge whether of simple toothaches or of philosophic systems as an ultimate fact. There are realities and there are 'states of mind,' and the latter know the former; and it is just as wonderful for a state of mind to be a 'sensation' and know a simple pain as for it to be a thought and know a system of related things.^[5] But there is no reason to suppose that when different states of mind know different things about the same toothache, they do so by virtue of their all *containing* faintly or vividly the original pain. Quite the reverse. The by-gone sensation of my gout was painful, as Reid somewhere says; the *thought* of the same gout as by-gone is pleasant, and in no respect resembles the earlier mental state.

Sensations, then, first make us acquainted with innumerable things, and then are replaced by thoughts which know the same things in altogether other ways. And Locke's main doctrine remains eternally true, however hazy some of his language may have been, that

"though there be a great number of considerations wherein things may be compared one with another, and so a multitude of relations; yet they all *terminate in*, and are concerned about, those simple ideas^[6] either of sensation or reflection, which I think to be the whole materials of all our knowledge.... The simple ideas we receive from sensation and reflection are the *boundaries* of our thoughts; beyond which, the mind whatever efforts it would make, is not able to advance one jot; nor can it make any discoveries when it would pry into the nature and hidden causes of those ideas."^[7]

The nature and hidden causes of ideas will never be unravelled till the *nexus* between the brain and consciousness is cleared up. All we can say now is that sensations are *first* things in the way of consciousness. Before conceptions can come, sensations must have come; but before sensations come, no psychic fact need have existed, a nerve-current is enough. If the

nerve-current be not given, nothing else will take its place. To quote the good Locke again:

"It is not in the power of the most exalted wit or enlarged understanding, by any quickness or variety of thoughts, to invent or frame one new simple idea [i.e. sensation] in the mind.... I would have any one try to fancy any taste which had never affected his palate, or frame the idea of a scent he had never smelt; and when he can do this, I will also conclude that a blind man hath ideas of colors, and a deaf man true distinct notions of sounds."^[8]

The brain is so made that all currents in it run one way. Consciousness of some sort goes with all the currents, but it is only when new currents are entering that it has the sensational *tang*. And it is only then that consciousness directly *encounters* (to use a word of Mr. Bradley's) a reality outside itself.

The difference between such encounter and all conceptual knowledge is very great. A blind man may know all *about* the sky's blueness, and I may know all *about* your toothache, conceptually; tracing their causes from primeval chaos, and their consequences to the crack of doom. But so long as he has not felt the blueness, nor I the toothache, our knowledge, wide as it is, of these realities, will be hollow and inadequate. Somebody must *feel* blueness, somebody must *have* toothache, to make human knowledge of these matters real. Conceptual systems which neither began nor left off in sensations would be like bridges without piers. Systems about fact must plunge themselves into sensation as bridges plunge their piers into the rock. Sensations are the stable rock, the *terminus a quo* and the *terminus ad quem* of thought. To find such termini is our aim with all our theories—to conceive first when and where a certain sensation may be had, and then to have it. Finding it stops discussion. Failure to find it kills the false conceit of knowledge. Only when you deduce a possible sensation for me from your theory, and give it to me when and where the theory requires, do I begin to be sure that your thought has anything to do with truth.

Pure sensations can only be realized in the earliest days of life. They are all but impossible to adults with memories and stores of associations acquired. Prior to all impressions on sense-organs the brain is plunged in deep sleep

and consciousness is practically non-existent. Even the first weeks after birth are passed in almost unbroken sleep by human infants. It takes a strong message from the sense-organs to break this slumber. In a new-born brain this gives rise to an absolutely pure sensation. But the experience leaves its 'unimaginable touch' on the matter of the convolutions, and the next impression which a sense-organ transmits produces a cerebral reaction in which the awakened vestige of the last impression plays its part. Another sort of feeling and a higher grade of cognition are the consequence; and the complication goes on increasing till the end of life, no two successive impressions falling on an identical brain, and no two successive thoughts being exactly the same. (See Vol. I, p. 230 ff.)

*The first sensation which an infant gets is for him the Universe. And the Universe which he later comes to know is nothing but an amplification and an implication of that first simple germ which, by accretion on the one hand and intussusception on the other, has grown so big and complex and articulate that its first estate is unrememberable. In his dumb awakening to the consciousness of *something there*, a mere *this* as yet (or something for which even the term *this* would perhaps be too discriminative, and the intellectual acknowledgment of which would be better expressed by the bare interjection 'lo!'), the infant encounters an object in which (though it be given in a pure sensation) all the 'categories of the understanding' are contained. *It has objectivity, unity, substantiality, causality, in the full sense in which any later object or system of objects has these things.* Here the young knower meets and greets his world; and the miracle of knowledge bursts forth, as Voltaire says, as much in the infant's lowest sensation as in the highest achievement of a Newton's brain. The physiological condition of this first sensible experience is probably nerve-currents coming in from many peripheral organs at once. Later, the one confused Fact which these currents cause to appear is perceived to be many facts, and to contain many qualities.^[9] For as the currents vary, and the brain-paths are moulded by them, other thoughts with other 'objects' come, and the 'same thing' which was apprehended as a present *this* soon figures as a past *that*, about which many unsuspected things have come to light. The principles of this development have been laid down already in Chapters XII and XIII, and nothing more need here be added to that account.*

"THE RELATIVITY OF KNOWLEDGE."

To the reader who is tired of so much *Erkenntnisstheorie* I can only say that I am so myself, but that it is indispensable, in the actual state of opinions about Sensation, to try to clear up just what the word means. Locke's pupils seek to do the impossible with sensations, and against them we must once again insist that sensations 'clustered together' cannot build up our more intellectual states of mind. Plato's earlier pupils used to admit Sensation's existence, grudgingly, but they trampled it in the dust as something corporeal, non-cognitive, and vile.^[10] His latest followers seem to seek to crowd it out of existence altogether. The only reals for the neo-Hegelian writers appear to be *relations*, relations without terms, or whose terms are only speciously such and really consist in knots, or gnarls of relations finer still *in infinitum*.

"Exclude from what we have considered real all qualities constituted by relation, we find that none are left." "Abstract the many relations from the one thing and there is nothing.... Without the relations it would not exist at all."^[11] "The single feeling is nothing real." "On the recognition of relations as constituting the *nature* of ideas, rests the possibility of any tenable theory of their reality."

Such quotations as these from the late T. H. Green^[12] would be matters of curiosity rather than of importance, were it not that sensationalist writers themselves believe in a so-called 'Relativity of Knowledge,' which, if they only understood it, they would see to be identical with Professor Green's doctrine. They tell us that the relation of sensations to each other is something belonging to their essence, and that no one of them has an absolute content:

"That, e.g., black can only be felt in contrast to white, or at least in distinction from a paler or a deeper black; similarly a tone or a sound only in alternation with others or with silence; and in like manner a smell, a taste, a touch, only, so to speak, *in statu nascendi*, whilst, when the stimulus continues, all sensation disappears. This all seems at first sight to be splendidly consistent both with itself and with the facts. But looked at more closely, it is seen that neither is the case."^[13]

The two leading facts from which the doctrine of universal relativity derives its wide-spread credit are these:

- 1) The *psychological fact* that so much of our actual knowledge *is* of the relations of things—even our simplest sensations in adult life are habitually referred to classes as we take them in; and
- 2) The *physiological fact* that our senses and brain must have periods of change and repose, else we cease to feel and think.

Neither of these facts proves anything about the presence or non-presence to our mind of absolute qualities with which we become sensibly acquainted. Surely not the psychological fact; for our inveterate love of relating and comparing things does not alter the intrinsic qualities or nature of the things compared, or undo their absolute givenness. And surely not the physiological fact; for the length of time during which we can feel or attend to a quality is altogether irrelevant to the intrinsic constitution of the quality felt. The time, moreover, is long enough in many instances, as sufferers from neuralgia know.^[14] And the doctrine of relativity, not proved by these facts, is flatly disproved by other facts even more patent. So far are we from not knowing (in the words of Professor Bain) "any one thing by itself, but only the difference between it and another thing," that if this were true the whole edifice of our knowledge would collapse. If all we felt were the *difference* between the *C* and *D*, or *c* and *d*, on the musical scale, that being the same in the two pairs of notes, the pairs themselves would be the same, and language could get along without substantives. But Professor Bain does not mean seriously what he says, and we need spend no more time on this vague and popular form of the doctrine.^[15] The facts which seem to hover before the minds of its champions are those which are best described under the head of a physiological law.

THE LAW OF CONTRAST.

I will first enumerate the main facts which fall under this law, and then remark upon what seems to me their significance for psychology.^[16]

[Nowhere are the phenomena of contrast better exhibited, and their laws more open to accurate study, than in connection with the sense of sight. Here both kinds—simultaneous and successive—can easily be observed, for

they are of constant occurrence. Ordinarily they remain unnoticed, in accordance with the general law of economy which causes us to select for conscious notice only such elements of our object as will serve us for æsthetic or practical utility, and to neglect the rest; just as we ignore the double images, the *mouches volantes*, etc., which exist for everyone, but which are not discriminated without careful attention. But by attention we may easily discover the general facts involved in contrast. We find that *in general the color and brightness of one object always apparently affect the color and brightness of any other object seen simultaneously with it or immediately after.*

In the first place, if we look for a moment at any surface and then turn our eyes elsewhere, the complementary color and opposite degree of brightness to that of the first surface tend to mingle themselves with the color and the brightness of the second. This is *successive contrast*. It finds its explanation in the fatigue of the organ of sight, causing it to respond to any particular stimulus less and less readily the longer such stimulus continues to act. This is shown clearly in the very marked changes which occur in case of continued fixation of one particular point of any field. The field darkens slowly, becomes more and more indistinct, and finally, if one is practised enough in holding the eye perfectly steady, slight differences in shade and color may entirely disappear. If we now turn aside the eyes, a negative after-image of the field just fixated at once forms, and mingles its sensations with those which may happen to come from anything else looked at. This influence is distinctly evident only when the first surface has been 'fixated' without movement of the eyes. It is, however, none the less present at all times, even when the eye wanders from point to point, causing each sensation to be modified more or less by that just previously experienced. On this account successive contrast is almost sure to be present in cases of simultaneous contrast, and to complicate the phenomena.

A visual image is modified not only by other sensations just previously experienced, but also by all those experienced simultaneously with it, and especially by such as proceed from contiguous portions of the retina. This is the phenomenon of *simultaneous contrast*. In this, as in successive contrast, both brightness and hue are involved. A bright object appears still brighter when its surroundings are darker than itself, and darker when they are brighter than itself. Two colors side by side are apparently changed by the

admixture, with each, of the complement of the other. And lastly, a gray surface near a colored one is tinged with the complement of the latter.^[17]

The phenomena of simultaneous contrast in sight are so complicated by other attendant phenomena that it is difficult to isolate them and observe them in their purity. Yet it is evidently of the greatest importance to do so, if one would conduct his investigations accurately. Neglect of this principle has led to many mistakes being made in accounting for the facts observed. As we have seen, if the eye is allowed to wander here and there about the field as it ordinarily does, successive contrast results and allowance must be made for its presence. It can be avoided only by carefully fixating with the well-rested eye a point of one field, and by then observing the changes which occur in this field when the contrasting field is placed by its side. Such a course will insure pure simultaneous contrast. But even thus it lasts in its purity for a moment only. It reaches its maximum of effect immediately after the introduction of the contrasting field, and then, if the fixation is continued, it begins to weaken rapidly and soon disappears; thus undergoing changes similar to those observed when any field whatever is fixated steadily and the retina becomes fatigued by unchanging stimuli. If one continues still further to fixate the same point, the color and brightness of one field tend to spread themselves over and mingle with the color and brightness of the neighboring fields, thus substituting '*simultaneous induction*' for simultaneous contrast.

Not only must we recognize and eliminate the effects of successive contrast, of temporal changes due to fixation, and of simultaneous induction, in analyzing the phenomena of simultaneous contrast, but we must also take into account *various other influences which modify its effects*. Under favorable circumstances the contrast-effects are very striking, and did they always occur as strongly they could not fail to attract the attention. But they are not always clearly apparent, owing to various disturbing causes which form no exception to the laws of contrast, but which have a modifying effect on its phenomena. When, for instance, the ground observed has many distinguishable features—a *coarse grain, rough surface, intricate pattern*, etc.—the contrast effect appears weaker. This does not imply that the effects of contrast are absent, but merely that the resulting sensations are overpowered by the many other stronger sensations which entirely occupy the attention. On such a ground a faint negative after-image—undoubtedly

due to retinal modifications—may become invisible; and even weak objective differences in color may become imperceptible. For example, a faint spot or grease-stain on woollen cloth, easily seen at a distance, when the fibres are not distinguishable, disappears when closer examination reveals the intricate nature of the surface.

Another frequent cause of the apparent absence of contrast is the presence of narrow dark intermediate fields, such as are formed by *bordering a field with black lines, or by the shaded contours of objects*. When such fields interfere with the contrast, it is because black and white can absorb much color without themselves becoming clearly colored; and because such lines separate other fields too far for them to distinctly influence one another. Even weak objective differences in color may be made imperceptible by such means.

A third case where contrast does not clearly appear is where the *color of the contrasting fields is too weak or too intense*, or where there is *much difference in brightness between the two fields*. In the latter case, as can easily be shown, it is the contrast of brightness which interferes with the color-contrast and makes it imperceptible. For this reason contrast shows best between fields of about equal brightness. But the intensity of the color must not be too great, for then its very darkness necessitates a dark contrasting field which is too absorbent of induced color to allow the contrast to appear strongly. The case is similar if the fields are too light.

To obtain the best contrast-effects, therefore, the contracting fields should be near together, should not be separated by shadows or black lines, should be of homogeneous texture, and should be of about equal brightness and medium intensity of color. Such conditions do not often occur naturally, the disturbing influences being present in case of almost all ordinary objects, thus making the effects of contrast far less evident. To eliminate these disturbances and to produce the conditions most favorable for the appearance of good contrast-effects, various experiments have been devised, which will be explained in comparing the rival theories of explanation.

There are *two theories—the psychological and the physiological*—which attempt to explain the phenomena of contrast.

Of these the *psychological one* was the first to gain prominence. *Its most able advocate has been Helmholtz. It explains contrast as a* DECEPTION OF JUDGMENT. In ordinary life our sensations have interest for us only so far as they give us practical knowledge. Our chief concern is to recognize objects, and we have no occasion to estimate exactly their absolute brightness and color. Hence we gain no facility in so doing, but neglect the constant changes in their shade, and are very uncertain as to the exact degree of their brightness or tone of their color. When objects are near one another "we are inclined to consider those differences which are clearly and surely perceived as greater than those which appear uncertain in perception or which must be judged by aid of memory,"^[18] just as we see a medium-sized man taller than he really is when he stands beside a short man. Such deceptions are more easily possible in the judgment of small differences than of large ones; also where there is but one element of difference instead of many. In a large number of cases of contrast, in all of which a whitish spot is surrounded on all sides by a colored surface—Meyer's experiment, the mirror experiment, colored shadows, etc., soon to be described—the contrast is produced, according to Helmholtz, by the fact that "a colored illumination or a transparent colored covering appears to be spread out over the field, and observation does not show directly that it fails on the white spot."^[19] We therefore believe that we see the latter through the former color. Now

"Colors have their greatest importance for us in so far as they are properties of bodies and can serve as signs for the recognition of bodies.... We have become accustomed, in forming a judgment in regard to the colors of bodies, to eliminate the varying brightness and color of the illumination. We have sufficient opportunity to investigate the same colors of objects in full sunshine, in the blue light of the clear sky, in the weak white light of a cloudy day, in the reddish-yellow light of the sinking sun or of the candle. Moreover the colored reflections of surrounding objects are involved. Since we see the same colored objects under these varying illuminations, we learn to form a correct conception of the color of the object in spite of the difference in illumination, i.e. to judge how such an object would appear in white

illumination; and since only the constant color of the object interests us, we do not become conscious of the particular sensations on which our judgment rests. So also we are at no loss, when we see an object through a colored covering, to distinguish what belongs to the color of the covering and what to the object. In the experiments mentioned we do the same also where the covering over the object is not at all colored, because of the deception into which we fall, and in consequence of which we ascribe to the body a false color, the color complementary to the colored portion of the covering."^[20]

We think that we see the complementary color through the colored covering,—for these two colors together would give the sensation of white which is actually experienced. If, however, in any way the white spot is recognized as an independent object, or if it is compared with another object known to be white, our judgment is no longer deceived and the contrast does not appear.

"As soon as the contrasting field is recognized as an independent body which lies above the colored ground, or even through an adequate tracing of its outlines is seen to be a separate field, the contrast disappears. Since, then, the judgment of the spatial position, the material independence, of the object in question is decisive for the determination of its color, it follows that the contrast-color arises not through an act of sensation but through an act of judgment."^[21]

In short, the apparent change in color or brightness through contrast is due to no change in excitation of the organ, to no change in sensation; but in consequence of a false judgment the unchanged sensation is wrongly interpreted, and thus leads to a changed *perception* of the brightness or color.

In opposition to this theory has been developed one which attempts to explain all cases of contrast as depending purely on *physiological action of the terminal apparatus of vision*. *Hering is the most prominent supporter of this view*. By great originality in devising experiments and by insisting on

rigid care in conducting them, he has been able to detect the faults in the psychological theory and to practically establish the validity of his own. Every visual sensation, he maintains, is correlated to a physical process in the nervous apparatus. Contrast is occasioned, not by a false idea resulting from unconscious conclusions, but by the fact that the excitation of any portion of the retina—and the consequent sensation—depends not only on its own illumination, but on that of the rest of the retina as well.

"If this psycho-physical process is aroused, as usually happens, by light-rays impinging on the retina, its nature depends not only on the nature of these rays, but also on the constitution of the entire nervous apparatus which is connected with the organ of vision, and on the state in which it finds itself."^[22]

When a limited portion of the retina is aroused by external stimuli, the rest of the retina, and especially the immediately contiguous parts, tends to react also, and in such a way as to produce therefrom the sensation of the opposite degree of brightness and the complementary color to that of the directly-excited portion. When a gray spot is seen alone, and again when it appears colored through contrast, the objective light from the spot is in both cases the same. Helmholtz maintains that the neural process and the corresponding *sensation* also remain unchanged, but are differently *interpreted*; Hering, that the neural process and the sensation are themselves changed, and that the 'interpretation' is the direct conscious correlate of the altered retinal conditions. According to the one, the contrast is psychological in its origin; according to the other, it is purely physiological. In the cases cited above where the contrast-color is no longer apparent—on a ground with many distinguishable features, on a field whose borders are traced with black lines, etc.,—the psychological theory, as we have seen, attributes this to the fact that under these circumstances we judge the smaller patch of color to be an independent object on the surface, and are no longer deceived in judging it to be something over which the color of the ground is drawn. The physiological theory, on the other hand, maintains that the contrast-effect is still produced, but that the conditions are such that the slight changes in color and brightness which it occasions become imperceptible.

The two theories, stated thus broadly, may seem equally plausible. Hering, however, has conclusively proved, by experiments with after-images, that the process on one part of the retina does modify that on neighboring portions, under conditions where deception of judgment is impossible.^[23] A careful examination of the facts of contrast will show that its phenomena must be due to this cause. *In all the cases which one may investigate it will be seen that the upholders of the psychological theory have failed to conduct their experiments with sufficient care.* They have not excluded successive contrast, have overlooked the changes due to steady fixation, and have failed to properly account for the various modifying influences which have been mentioned above. We can easily establish this if we examine the most striking experiments in simultaneous contrast.

Of these one of the best known and most easily arranged is that known as *Meyer's experiment*. A scrap of gray paper is placed on a colored background, and both are covered by a sheet of transparent white paper. The gray spot then assumes a contrast-color, complementary to that of the background, which shines with a whitish tinge through the paper which covers it. Helmholtz explains the phenomenon thus:

"If the background is green, the covering-paper itself appears to be of a greenish color. If now the substance of the paper extends without apparent interruption over the gray which lies under it, we think that we see an object glimmering through the greenish paper, and such an object must in turn be rose-red, in order to give white light. If, however, the gray spot has its limits so fixed that it appears to be an independent object, the continuity with the greenish portion of the surface fails, and we regard it as a gray object which lies on this surface."^[24]

The contrast-color may thus be made to disappear by tracing in black the outlines of the gray scrap, or by placing above the tissue paper another gray scrap of the same degree of brightness, and comparing together the two grays. On neither of them does the contrast-color now appear.

Hering^[25] shows clearly that this interpretation is incorrect, and that the disturbing factors are to be otherwise explained. In the first place, the experiment can be so arranged that we could not possibly be deceived into believing that we see the gray through a colored medium. Out of a sheet of gray paper cut strips 5 mm. wide in such a way that there will be alternately an empty space and a bar of gray, both of the same width, the bars being held together by the uncut edges of the gray sheet (thus presenting an appearance like a gridiron). Lay this on a colored background—e.g. green—cover both with transparent paper, and above all put a black frame which covers all the edges, leaving visible only the bars, which are now alternately green and gray. The gray bars appear strongly colored by contrast, although, since they occupy as much space as the green bars, we are not deceived into believing that we see the former through a green medium. The same is true if we weave together into a basket pattern narrow strips of green and gray and cover them with the transparent paper.

Why, then, if it is a true sensation due to physiological causes, and not an error of judgment, which causes the contrast, does the color disappear when the outlines of the gray scrap are traced, enabling us to recognize it as an independent object? In the first place, it does not necessarily do so, as will easily be seen if the experiment is tried. The contrast-color often remains distinctly visible in spite of the black outlines. In the second place, there are many adequate reasons why the effect should be modified. Simultaneous contrast is always strongest at the border-line of the two fields; but a narrow black field now separates the two, and itself by contrast strengthens the whiteness of both original fields, which were already little saturated in color; and on black and on white, contrast-colors show only under the most favorable circumstances. Even weak objective differences in color may be made to disappear by such tracing of outlines, as can be seen if we place on a gray background a scrap of faintly-colored paper, cover it with transparent paper and trace its outlines. Thus we see that it is not the recognition of the contrasting field as an independent object which interferes with its color, but rather a number of entirely explicable physiological disturbances.

The same may be proved in the case of holding above the tissue paper a second gray scrap and comparing it with that underneath. To avoid the disturbances caused by using papers of different brightness, the second scrap should be made exactly like the first by covering the same gray with

the same tissue paper, and carefully cutting a piece about 10 mm. square out of both together. To thoroughly guard against successive contrast, which so easily complicates the phenomena, we must carefully prevent all previous excitation of the retina by colored light. This may be done by arranging thus: Place the sheet of tissue paper on a glass pane, which rests on four supports; under the paper put the first gray scrap. By means of a wire, fasten the second gray scrap 2 or 3 cm. above the glass plate. Both scraps appear exactly alike, except at the edges. Gaze now at both scraps, with eyes not exactly accommodated, so that they appear near one another, with a very narrow space between. Shove now a colored field (green) underneath the glass plate, and the contrast appears at once on both scraps. If it appears less clearly on the upper scrap, it is because of its bright and dark edges, its inequalities, its grain, etc. When the accommodation is exact, there is no essential change, although then on the upper scrap the bright edge on the side toward the light, and the dark edge on the shadow side, disturb somewhat. By continued fixation the contrast becomes weaker and finally yields to simultaneous induction, causing the scraps to become indistinguishable from the ground. Remove the green field and both scraps become green, by successive induction. If the eye moves about freely these last-named phenomena do not appear, but the contrast continues indefinitely and becomes stronger. When Helmholtz found that the contrast on the lower scrap disappeared, it was evidently because he then really held the eye fixed. This experiment may be disturbed by holding the upper scrap wrongly and by the differences in brightness of its edges, or by other inequalities, but not by that recognizing of it 'as an independent body lying above the colored ground,' on which the psychological explanation rests.

In like manner the claims of the psychological explanation can be shown to be inadequate in other cases of contrast. Of frequent use are revolving disks, which are especially efficient in showing good contrast-phenomena, because all inequalities of the ground disappear and leave a perfectly homogeneous surface. On a white disk are arranged colored sectors, which are interrupted midway by narrow black fields in such a way that when the disk is revolved the white becomes mixed with the color and the black, forming a colored disk of weak saturation on which appears a gray ring. The latter is colored by contrast with the field which surrounds it. Helmholtz explains the fact thus:

"The difference of the compared colors appears greater than it really is either because this difference, when it is the only existing one and draws the attention to itself alone, makes a stronger impression than when it is one among many, or because the different colors of the surface are conceived as alterations of the one ground-color of the surface such as might arise through shadows falling on it, through colored reflexes, or through mixture with colored paint or dust. In truth, to produce an objectively gray spot on a green surface, a reddish coloring would be necessary."^[26]

This explanation is easily proved false by painting the disk with narrow green and gray concentric rings, and giving each a different saturation. The contrast appears though there is no ground-color, and no longer a single difference, but many. The facts which Helmholtz brings forward in support of his theory are also easily turned against him. He asserts that if the color of the ground is too intense, or if the gray ring is bordered by black circles, the contrast becomes weaker; that no contrast appears on a white scrap held over the colored field; and that the gray ring when compared with such scrap loses its contrast-color either wholly or in part. Hering points out the inaccuracy of all these claims. Under favorable conditions it is impossible to make the contrast disappear by means of black enclosing lines, although they naturally form a disturbing element; increase in the saturation of the field, if disturbance through increasing brightness-contrast is to be avoided, demands a darker gray field, on which contrast-colors are less easily perceived; and careful use of the white scrap leads to entirely different results. The contrast-color does appear upon it when it is first placed above the colored field; but if it is carefully fixated, the contrast-color diminishes very rapidly both on it and on the ring, from causes already explained. To secure accurate observation, all complication through successive contrast should be avoided thus: first arrange the white scrap, then interpose a gray screen between it and the disk, rest the eye, set the wheel in motion, fixate the scrap, and then have the screen removed. The contrast at once appears clearly, and its disappearance through continued fixation can be accurately watched.

Brief mention of a few other cases of contrast must suffice. The so-called mirror experiment consists of placing at an angle of 45° a green (or otherwise colored) pane of glass, forming an angle with two white surfaces, one horizontal and the other vertical. On each white surface is a black spot. The one on the horizontal surface is seen through the glass and appears dark green, the other is reflected from the surface of the glass to the eye, and appears by contrast red. The experiment may be so arranged that we are not aware of the presence of the green glass, but think that we are looking directly at a surface with green and red spots upon it; in such a case there is no deception of judgment caused by making allowance for the colored medium through which we think that we see the spot, and therefore the

psychological explanation does not apply. On excluding successive contrast by fixation the contrast soon disappears as in all similar experiments.^[27]

Colored shadows have long been thought to afford a convincing proof of the fact that simultaneous contrast is psychological in its origin. They are formed whenever an opaque object is illuminated from two separate sides by lights of different colors. When the light from one source is white, its shadow is of the color of the other light, and the second shadow is of a color complementary to that of the field illuminated by both lights. If now we take a tube, blackened inside, and through it look at the colored shadow, none of the surrounding field being visible, and then have the colored light removed, the shadow still appears colored, although 'the circumstances which caused it have disappeared.' This is regarded by the psychologists as conclusive evidence that the color is due to deception of judgment. It can, however, easily be shown that the persistence of the color seen through the tube is due to fatigue of the retina through the prevailing light, and that when the colored light is removed the color slowly disappears as the equilibrium of the retina becomes gradually restored. When successive contrast is carefully guarded against, the simultaneous contrast, whether seen directly or through the tube, never lasts for an instant on removal of the colored field. The physiological explanation applies throughout to all the phenomena presented by colored shadows.^[28]

If we have a small field whose illumination remains constant, surrounded by a large field of changing brightness, an increase or decrease in brightness of the latter results in a corresponding apparent decrease or increase respectively in the brightness of the former, while the large field seems to be unchanged. Exner says:

"This illusion of sense shows that we are inclined to regard as constant the dominant brightness in our field of vision, and hence to refer the changing difference between this and the brightness of a limited field to a change in brightness of the latter."

The result, however, can be shown to depend not on illusion, but on actual retinal changes, which alter the sensation experienced. The irritability of those portions of the retina lighted by the large field becomes much reduced in consequence of fatigue, so that the increase in brightness becomes much

less apparent than it would be without this diminution in irritability. The small field, however, shows the change by a change in the contrast-effect induced upon it by the surrounding parts of the retina.^[29]

The above cases show clearly that *physiological processes, and not deception of judgment, are responsible for contrast of color*. To say this, however, is not to maintain that our perception of a color is never in any degree modified by our judgment of what the particular colored thing before us may be. We have unquestionable illusions of color due to wrong inferences as to what object is before us. Thus Von Kries^[30] speaks of wandering through evergreen forests covered with snow, and thinking that through the interstices of the boughs he saw the deep blue of pine-clad mountains, covered with snow and lighted by brilliant sunshine; whereas what he really saw was the white snow on trees near by, lying in shadow].^[31]

Such a mistake as this is undoubtedly of psychological origin. It is a wrong *classification* of the appearances, due to the arousal of intricate processes of association amongst which is the suggestion of a different hue from that really before the eyes. In the ensuing chapters such illusions as this will be treated of in considerable detail. But it is a mistake to interpret the simpler cases of contrast in the light of such illusions as these. These illusions can be rectified in an instant, and we then wonder how they could have been. They come from insufficient attention, or from the fact that the impression which we get is a sign of more than one possible object, and can be interpreted in either way. In none of these points do they resemble simple color-contrast, which *unquestionably is a phenomenon of sensation immediately aroused*.

I have dwelt upon the facts of color-contrast at such great length because they form so good a text to comment on in my struggle against the view that sensations are immutable psychic things which coexist with higher mental functions. Both sensationalists and intellectualists agree that such sensations exist. They *fuse*, say the pure sensationalists, and *make* the higher mental function; they *are combined* by activity of the Thinking Principle, say the

intellectualists. I myself have contended that they *do not exist* in or alongside of the higher mental function when that exists. The things which arouse them exist; and the higher mental function also knows these same things. But just as its knowledge of the things supersedes and displaces their knowledge, so it supersedes and displaces them, when it comes, being as much as they are a direct resultant of whatever momentary brain-conditions may obtain. The psychological theory of contrast, on the other hand, holds the sensations still to exist in themselves unchanged before the mind, whilst the 'relating activity' of the latter deals with them freely and settles to its own satisfaction what each shall be, in view of what the others also are. Wundt says expressly that the Law of Relativity is "not a law of sensation but a law of Apperception;" and the word Apperception connotes with him a higher intellectual spontaneity.^[32] This way of taking things belongs with the philosophy that looks at the *data* of sense as something earth-born and servile, and the 'relating of them together' as something spiritual and free. Lo! the spirit can even change the intrinsic quality of the sensible facts themselves if by so doing it can relate them better to each other! But (apart from the difficulty of seeing how changing the sensations should relate them better) is it not manifest that the relations are part of the 'content' of consciousness, part of the 'object,' just as much as the sensations are? Why ascribe the former exclusively to the *knower* and the latter to the *known*? The *knower* is in every case a unique pulse of thought corresponding to a unique reaction of the brain upon its conditions. All that the facts of contrast show us is that the *same real thing* may give us quite different sensations when the conditions alter, and that we must therefore be careful which one to select as the thing's truest representative.

There are many other facts beside the phenomena of contrast which prove that when two objects act together on us the sensation which either would give alone becomes a different sensation. A certain amount of skin dipped in hot water gives the perception of a certain heat. More skin immersed makes the heat much more intense, although of course the water's heat is the same. A certain extent as well as intensity, in the quantity of the stimulus is requisite for any quality to be felt. Fick and Wunderli could not

distinguish heat from touch when both were applied through a hole in a card, and so confined to a small part of the skin. Similarly there is a *chromatic minimum* of size in objects. The image they cast on the retina must needs have a certain extent, or it will give no sensation of color at all. Inversely, more intensity in the outward impression may make the subjective object more extensive. This happens, as will be shown in [Chapter XIX](#), when the illumination is increased: The whole room expands and dwindles according as we raise or lower the gas-jet. It is not easy to explain any of these results as illusions of judgment due to the inference of a wrong objective cause for the sensation which we get. No more is this easy in the case of Weber's observation that a thaler laid on the skin of the forehead feels heavier when cold than when warm; or of Szabadföldi's observation that small wooden disks when heated to 122° Fahrenheit often feel heavier than those which are larger but not thus warmed;^[33] or of Hall's observation that a heavy point moving over the skin seems to go faster than a lighter one moving at the same rate of speed.^[34]

Bleuler and Lehmann some years ago called attention to a strange idiosyncrasy found in some persons, and consisting in the fact that impressions on the eye, skin, etc., were accompanied by distinct sensations of *sound*.^[35] *Colored hearing* is the name sometimes given to the phenomenon, which has now been repeatedly described. Quite lately the Viennese aurist Urbantschitsch has proved that these cases are only extreme examples of a very general law, and that all our sense-organs influence each other's sensations.^[36] The hue of patches of color so distant as not to be recognized was immediately, in U.'s patients, perceived when a tuning-fork was sounded close to the ear. Sometimes, on the contrary, the field was darkened by the sound. The acuity of vision was increased, so that letters too far off to be read could be read when the tuning-fork was heard. Urbantschitsch, varying his experiments, found that their results were mutual, and that sounds which were on the limits of audibility became audible when lights of various colors were exhibited to the eye. Smell, taste, touch, sense of temperature, etc., were all found to fluctuate when lights were seen and sounds were heard. Individuals varied much in the degree and kind of effect produced, but almost every one experimented on seems to have been in some way affected. The phenomena remind one somewhat of the 'dynamogenic' effects of sensations upon the strength of muscular

contraction observed by M. Féré, and later to be described. The most familiar examples of them seem to be the increase of *pain* by noise or light, and the increase of *nausea* by all concomitant sensations. Persons suffering in any way instinctively seek stillness and darkness.

Probably every one will agree that the best way of formulating all such facts is physiological: it must be that the cerebral process of the first sensation is reinforced or otherwise altered by the other current which comes in. No one, surely, will prefer a psychological explanation *here*. Well, it seems to me that *all* cases of mental reaction to a plurality of stimuli must be like these cases, and that the physiological formulation is everywhere the simplest and the best. When simultaneous red and green light make us see yellow, when three notes of the scale make us hear a chord, it is not because the sensations of red and of green and of each of the three notes enter the mind as such, and there 'combine' or 'are combined by its relating activity' into the yellow and the chord, it is because the larger sum of light-waves and of air-waves arouses new cortical processes, to which the yellow and the chord directly correspond. Even when the sensible qualities of things enter into the objects of our highest thinking, it is surely the same. Their several *sensations* do not continue to exist there tucked away. They are *replaced* by the higher thought which, although a different psychic unit from them, knows the same sensible qualities which they know.

The principles laid down in Chapter VI seem then to be corroborated in this new connection. *You cannot build up one thought or one sensation out of many; and only direct experiment can inform us of what we shall perceive when we get many stimuli at once.*

THE 'ECCENTRIC PROJECTION' OF SENSATIONS.

We often hear the opinion expressed that all our sensations at first appear to us as subjective or internal, and are afterwards and by a special act on our part 'extradited' or 'projected' so as to appear located in an outer world. Thus we read in Professor Ladd's valuable work that

"Sensations... are psychological states *whose place*—so far as they can be said to have one—*is the mind*. The transference of these sensations from mere mental states to physical processes located in the periphery of the body, or to qualities of things projected in space external to the body, is a mental act. It may rather be said to be a mental *achievement* [cf. Cudworth, [note 10](#), as to knowledge being *conquering*], for it is an act which in its perfection results from a long and intricate process of development.... Two noteworthy stages, or 'epoch-making' achievements in the process of elaborating the presentations of sense, require a special consideration. These are '*localization*,' or the transference of the composite sensations from mere states of the mind to processes or conditions recognized as taking place at more or less definitely fixed points or areas of the body; and '*eccentric projection*' (sometimes called 'eccentric perception') or the giving to these sensations an objective existence (in the fullest sense of the word 'objective') as qualities of objects situated within a field of space and in contact with, or more or less remotely distant from, the body."^[37]

It seems to me that there is not a vestige of evidence for this view. It hangs together with the opinion that our sensations are originally devoid of all spatial content,^[38] an opinion which I confess that I am wholly at a loss to understand. As I look at my bookshelf opposite I cannot frame to myself an idea, however imaginary, of any feeling which I could ever possibly have got from it except the feeling of the same big extended sort of outward fact which I now perceive. So far is it from being true that our first way of feeling things is the feeling of them as subjective or mental, that the exact opposite seems rather to be the truth. Our earliest, most instinctive, least developed kind of consciousness is the objective kind; and only as reflection becomes developed do we become aware of an inner world at all. Then indeed we enrich it more and more, even to the point of becoming idealists, with the spoils of the outer world which at first was the only world we knew. But subjective consciousness, aware of itself as subjective, does not at first exist. Even an attack of pain is surely felt at first objectively as something in space which prompts to motor reaction, and to the very end it is located, not in the mind, but in some bodily part.

"A sensation which should not awaken an impulse to move, nor any tendency to produce an outward effect, would manifestly be useless to a living creature. On the principles of evolution such a sensation could never be developed. Therefore every sensation originally refers to something external and independent of the sentient creature. Rhizopods (according to Engelmann's observations) retract their pseudopodia whenever these touch foreign bodies, even if these foreign bodies are the pseudopodia of other individuals of their own species, whilst the mutual contact of their own pseudopodia is followed by no such contraction. These low animals can therefore already feel an outer world—even in the absence of innate ideas of causality, and probably without any clear consciousness of space. In truth the conviction that something exists outside of ourselves does not come from thought. It comes from sensation; it rests on the same ground as our conviction of our own existence.... If we consider the behavior of new-born animals, we never find them betraying that they are first of all conscious of their sensations as purely subjective excitements. We far more readily incline to explain the astonishing certainty with which they make use of their sensations (and which is an effect of adaptation and inheritance) as the result of an inborn intuition of the outer world.... Instead of starting from an original pure subjectivity of sensation, and seeking how this could possibly have acquired an objective signification, we must, on the contrary, begin by the possession of objectivity by the sensation and then show how for reflective consciousness the latter becomes interpreted as an effect of the object, how in short the original immediate objectivity becomes changed into a remote one."^[39]

Another confusion, much more common than the denial of all objective character to sensations, is the assumption that they are all originally located *inside the body* and are projected outward by a secondary act. This secondary judgment is always false, according to M. Taine, so far as the place of the sensation itself goes. But it happens to *hit* a real object which is at the point towards which the sensation is projected; so we may call its result, according to this author, a *veridical hallucination*.^[40] The word Sensation, to begin with, is constantly, in psychological literature, used as if it meant one and the same thing with the *physical impression* either in the

terminal organs or in the centres, which is its antecedent condition, and this notwithstanding that by sensation we mean a mental, not a physical, fact. But those who expressly mean by it a mental fact still leave to it a physical *place*, still think of it as objectively inhabiting the very neural tracts which occasion its appearance when they are excited; and then (going a step farther) they think that it must *place itself* where *they* place it, or be subjectively sensible of that place as its habitat in the first instance, and afterwards have to be *moved* so as to appear elsewhere.

All this seems highly confused and unintelligible. Consciousness, as we saw in an earlier chapter (vol. I p. 214) cannot properly be said to *inhabit* any place. It has dynamic relations with the brain, and cognitive relations with everything and anything. From the one point of view *we* may say that a sensation is in the same place with the brain (if we like), just as from the other point of view we may say that it is in the same place with whatever quality it may be cognizing. But the supposition that a sensation primitively *feels either itself or its object to be in the same place with the brain* is absolutely groundless, and neither *a priori* probability nor facts from experience can be adduced to show that such a deliverance forms any part of the original cognitive function of our sensibility.

Where, then, do we feel the objects of our original sensations to be?

Certainly a child newly born in Boston, who gets a sensation from the candle-flame which lights the bedroom, or from his diaper-pin, does not feel either of these objects to be situated in longitude 72° W. and latitude 41° N. He does not feel them to be in the third story of the house. He does not even feel them in any distinct manner to be to the right or the left of any of the other sensations which he may be getting from other objects in the room at the same time. He does not, in short, know anything *about* their space-relations to anything else in the world. The flame fills its own place, the pain fills its own place; but as yet these places are neither identified with, nor discriminated from, any other places. That comes later. For the places thus first sensibly known are elements of the child's space-world which remain with him all his life; and by memory and later experience he learns a vast number of things *about* those places which at first he did not know. But to the end of time certain places of the world remain defined for him as the places *where those sensations were*; and his only possible answer to the question *where anything is* will be to say '*there*,' and to name some

sensation or other like those first ones, which shall identify the spot. Space *means* but the aggregate of all our possible sensations. There is no duplicate space known *aliunde*, or created by an 'epoch-making achievement' into which our sensations, originally spaceless, are dropped. They *bring* space and all its places to our intellect, and do not derive it thence.

By his body, then, the child later means simply *that place where* the pain from the pin, and a lot of other sensations like it, were or are felt. It is no more true to say that he locates that pain in his body, than to say that he locates his body in that pain. Both are true: that pain is part of what he *means by the word body*. Just so by the outer world the child means nothing more than *that place where* the candle-flame and a lot of other sensations like it are felt. He no more locates the candle in the outer world than he locates the outer world in the candle. Once again, he does both; for the candle is part of what he *means* by 'outer world.'

This (it seems to me) will be admitted, and will (I trust) be made still more plausible in the chapter on the Perception of Space. But the later developments of this perception are so complicated that these simple principles get easily overlooked. One of the complications comes from the fact that things *move*, and that the original object which we feel them to be splits into two parts, one of which remains as their whereabouts and the other goes off as their quality or nature. We then contrast where they *were* with where they *are*. If *we* do not move, the sensation of *where they were* remains unchanged; but we ourselves presently move, so that that also changes; and 'where they were' becomes no longer the actual sensation which it was originally, but a sensation which we merely conceive as possible. Gradually the system of these possible sensations, takes more and more the place of the actual sensations. 'Up' and 'down' become 'subjective' notions; east and west grow more 'correct' than 'right' and 'left' etc.; and things get at last more 'truly' located by their relation to certain ideal fixed co-ordinates than by their relation either to our bodies or to those objects by which their place was originally defined. *Now this revision of our original localizations is a complex affair; and contains some facts which may very*

naturally come to be described as translocations whereby sensations get shoved farther off than they originally appeared.

Few things indeed are more striking than the changeable distance which the objects of many of our sensations may be made to assume. A fly's humming may be taken for a distant steam-whistle; or the fly itself, seen out of focus, may for a moment give us the illusion of a distant bird. The same things seem much nearer or much farther, according as we look at them through one end or another of an opera-glass. Our whole optical education indeed is largely taken up with assigning their proper distances to the objects of our retinal sensations. An infant will grasp at the moon; later, it is said, he projects that sensation to a distance which he knows to be beyond his reach. In the much quoted case of the 'young gentleman who was born blind,' and who was 'couched' for the cataract by Mr. Chesselden, it is reported of the patient that "when he first saw, he was so far from making any judgment about distances, that he thought all objects whatever touched his eyes (as he expressed it) as what he felt did his skin." And other patients born blind, but relieved by surgical operation, have been described as bringing their hand close to their eyes to feel for the objects which they at first saw, and only gradually stretching out their hand when they found that no contact occurred. Many have concluded from these facts that our earliest visual objects must seem in immediate contact with our eyes.

But tactile objects also may be affected with a like ambiguity of situation.

If one of the hairs of our head be pulled, we are pretty accurately sensible of the direction of the pulling by the movements imparted to the head.^[41] But the feeling of the pull is localized, not in that part of the hair's length which the fingers hold, but in the scalp itself. This seems connected with the fact that our hair hardly serves at all as a tactile organ. In creatures with *vibrissæ*, however, and in those quadrupeds whose whiskers are tactile organs, it can hardly be doubted that the feeling is projected out of the root into the shaft of the hair itself. We ourselves have an approach to this when the beard as a whole, or the hair as a whole, is touched. We perceive the contact at some distance from the skin.

When fixed and hard appendages of the body, like the teeth and nails, are touched, we feel the contact where it objectively is, and not deeper in,

where the nerve-terminations lie. If, however, the tooth is loose, we feel two contacts, spatially separated, one at its root, one at its top.

From this ease to that of a hard body not organically connected with the surface, but only accidentally in contact with it, the transition is immediate. With the point of a cane we can trace letters in the air or on a wall just as with the finger-tip; and in so doing feel the size and shape of the path described by the cane's tip just as immediately as, without a cane, we should feel the path described by the tip of our finger. Similarly the draughtsman's immediate perception seems to be of the point of his pencil, the surgeon's of the end of his knife, the duellist's of the tip of his rapier as it plunges through his enemy's skin. When on the middle of a vibrating ladder, we feel not only our feet on the round, but the ladder's feet against the ground far below. If we shake a locked iron gate we feel the middle, on which our hands rest, move, but we equally feel the stability of the ends where the hinges and the lock are, and we seem to feel all three at once.^[42] And yet the place where the contact is *received* is in all these cases the skin, whose sensations accordingly are sometimes interpreted as objects on the surface, and at other times as objects a long distance off.

We shall learn in the chapter on Space that our feelings of our own movement are principally due to the sensibility of our rotating *joints*. Sometimes by fixing the attention, say on our elbow-joint, we can feel the movement in the joint itself; but we always are simultaneously conscious of the path which during the movement our finger-tips describe through the air, and yet these same finger-tips themselves are in no way physically modified by the motion. A blow on our ulnar nerve behind the elbow is felt both there and in the fingers. Refrigeration of the elbow produces pain in the fingers. Electric currents passed through nerve-trunks, whether of cutaneous or of more special sensibility (such as the optic nerve), give rise to sensations which are vaguely localized beyond the nerve-tracts traversed. Persons whose legs or arms have been amputated are, as is well known, apt to preserve an illusory feeling of the lost hand or foot being there. Even when they do not have this feeling constantly, it may be occasionally brought back. This sometimes is the result of exciting electrically the nerve-trunks buried in the stump.

"I recently faradized," says Dr. Mitchell, "a case of disarticulated shoulder without warning my patient of the possible result. For two years he had altogether ceased to feel the limb. As the current affected the brachial plexus of nerves he suddenly cried aloud, 'Oh the hand,—the hand!' and attempted to seize the missing member. The phantom I had conjured up swiftly disappeared, but no spirit could have more amazed the man, so real did it seem."^[43]

Now the apparent position of the lost extremity varies. Often the foot seems on the ground, or follows the position of the artificial foot, where one is used. Sometimes where the arm is lost the elbow will seem bent, and the hand in a fixed position on the breast. Sometimes, again, the position is non-natural, and the hand will seem to bud straight out of the shoulder, or the foot to be on the same level with the knee of the remaining leg. Sometimes, again, the position is vague; and sometimes it is ambiguous, as in another patient of Dr. Weir Mitchell's who

"lost his leg at the age of eleven, and remembers that the foot by degrees approached, and at last reached the knee. When he began to wear an artificial leg it reassumed in time its old position, and he is never at present aware of the leg as shortened, unless for some time he talks and thinks of the stump, and of the missing leg, when ... the direction of attention to the part causes a feeling of discomfort, and the subjective sensation of active and unpleasant movement of the toes. With these feelings returns at once the delusion of the foot as being placed at the knee."

All these facts, and others like them, can easily be described as if our sensations might be induced by circumstances to migrate from their *original locality* near the brain or near the surface of the body, and to appear farther off; and (under different circumstances) to return again after having migrated. But a little analysis of what happens shows us that this description is inaccurate.

The objectivity with which each of our sensations originally comes to us, the roomy and spatial character which is a primitive part of its content, is not in the first instance relative to any other sensation. The first time we open our eyes we get an optical object which is *a place*, but which is not yet

placed in relation to any other object, nor identified with any place otherwise known. It is a place with which so far we are only *acquainted*. When later we know that this same place is in 'front' of us, that only means that we have learned something *about* it, namely, that it is *congruent with that other* place, called 'front,' which is given us by certain sensations of the arm and hand or of the head and body. But at the first moment of our optical experience, even though we already had an acquaintance with our head, hand, and body, we could not possibly know anything about their relations to this new seen object. It could not be immediately located in respect of *them*. How its place agrees with the places which their feelings yield is a matter of which only later experience can inform us; and in the next chapter we shall see with some detail how later experience does this by means of discrimination, association, selection, and other constantly working functions of the mind. When, therefore, the baby grasps at the moon, that does not mean that what he sees fails to give him the sensation which he afterwards knows as distance; it means only that he has not learned at what *tactile or manual distance* things which appear at that *visual distance* are.

[44] And when a person just operated for cataract gropes close to his face for far-off objects, that only means the same thing. All the ordinary optical signs of differing distances are absent from the poor creature's sensation anyhow. His vision is monocular (only one eye being operated at a time); the lens is gone, and everything is out of focus; he feels photophobia, lachrymation, and other painful resident sensations of the eyeball itself, whose place he has long since learned to know in tactile terms; what wonder, then, that the first tactile reaction which the new sensations provoke should be one associated with the tactile situation of the organ itself? And as for his assertions about the matter, what wonder, again, if, as Prof. Paul Janet says, they are still expressed in the tactile language which is the only one he knows. "*To be touched* means for him to receive an impression without first making a movement." His eye gets such an impression now; so he can only say that the objects are 'touching it.'

"All his language, borrowed from touch, but applied to the objects of his sight, make us think that he perceives differently from ourselves, whereas, at bottom, it is only his different way of talking about the same experience." [45]

The other cases of translocation of our sensations are equally easily interpreted without supposing any 'projection' from a centre at which they are originally perceived. Unfortunately the details are intricate; and what I say now can only be made fully clear when we come to the next chapter. We shall then see that we are constantly selecting certain of our sensations as *realities* and degrading others to the status of *signs* of these. When we get one of the signs we think of the reality signified; and the strange thing is that then the reality (which need not be itself a sensation at all at the time, but only an idea) is so interesting that it acquires an hallucinatory strength, which may even eclipse that of the relatively uninteresting sign and entirely divert our attention from the latter. Thus the sensations to which our joints give rise when they rotate are signs of what, through a large number of other sensations, tactile and optical, we have come to know as the movement of the whole limb. This movement of the whole limb is what we *think of* when the joint's nerves are excited in that way; and *its* place is so much more important than the joint's place that our sense of the latter is taken up, so to speak, into our perception of the former, and the sensation of the movement seems to diffuse itself into our very fingers and toes. But by abstracting our attention from the suggestion of the entire extremity we can perfectly well perceive the same sensation as if it were concentrated in one spot. We can identify it with a differently located tactile and visual image of 'the joint' itself.

Just so when we feel the tip of our cane against the ground. The peculiar sort of movement of the hand (impossible in one direction, but free in every other) which we experience when the tip touches 'the ground,' is a sign to us of the visual and tactile object which we already know under that name. We think of 'the ground' as being there and giving us the sensation of this kind of movement. The sensation, we say, comes *from* the ground. The ground's place seems to be its place; although at the same time, and for very similar practical reasons, we think of another optical and tactile object, 'the hand' namely, and consider that *its* place *also* must be the place of our sensation. In other words, we take an object or sensible content A, and confounding it with another object otherwise known, B, or with two objects otherwise known, B and C, we identify its place with their places. But in all this there is *no 'projecting'* (such as the extradition-philosophers talk of) of A out of an *original* place; no primitive location which it first occupied, *away from* these other sensations, has to be contradicted; no natural 'centre,' from

which it is expelled, exists. That would imply that A aboriginally came to us in definite local relations with other sensations, for to be *out* of B and C is to be in local relation with them as much as to be *in* them is so. But it was no more out of B and C than it was in them when it first came to us. It simply had nothing to do with them. To say that we feel a sensation's seat to be 'in the brain' or 'against the eye' or 'under the skin' is to say as much *about* it and to deal with it in as non-primitive a way as to say that it is a mile off. These are all secondary perceptions, ways of defining the sensation's seat *per aliud*. They involve numberless associations, identifications, and imaginations, and admit a great deal of vacillation and uncertainty in the result.^[46]

I conclude, then, that there is no truth in the 'eccentric projection' theory. It is due to the confused assumption that the bodily processes which cause a sensation must also be its seat.^[47] But sensations have no seat in this sense. They *become* seats for each other, as fast as experience associates them together; but that violates no primitive seat possessed by any one of them. And though our sensations cannot then so analyze and talk of themselves, yet at their very first appearance quite as much as at any later date are they cognizant of all those qualities which we end by extracting and conceiving under the names of *objectivity*, *exteriority*, and *extent*. It is surely *subjectivity* and *interiority* which are the notions *latest* acquired by the human mind.^[48]

[1] Some persons will say that we never have a really simple object or content. My definition of sensation does not require the simplicity to be absolutely, but only relatively, extreme. It is worth while in passing, however, to warn the reader against a couple of inferences that are often made. One is that because we gradually learn to analyze so many qualities we ought to conclude that there are no really indecomposable feelings in the mind. The other is that because the processes that produce our sensations are multiple, the sensations regarded as subjective facts must also be compound. To take an example, to a child the taste of lemonade comes at first as a simple quality. He later learns both that many stimuli and many nerves are involved in the exhibition of this taste to his mind, and he also learns to perceive separately the sourness, the coolness, the sweet, the lemon aroma, etc., and the several degrees of strength of each and all of these things,—the experience falling into a large

number of aspects, each of which is abstracted, classed, named, etc., and all of which appear to be the elementary sensations into which the original 'lemonade flavor' is decomposed. It is argued from this that the latter never was the simple thing which it seemed. I have already criticised this sort of reasoning in Chapter VI (see pp. 170 ff.). The mind of the child enjoying the simple lemonade flavor and that of the same child grown up and analyzing it are in two entirely different conditions. Subjectively considered, the two states of mind are two altogether distinct sorts of fact. The later mental state says 'this is the *same flavor (or fluid)* which that earlier state perceived as simple,' but that does not make the two states themselves identical. It is nothing but a case of learning more and more *about* the same topics of discourse or things.—Many of these topics, however, must be confessed to resist all analysis, the various colors for example. He who sees blue and yellow 'in' a certain green means merely that when green is confronted with these other colors he sees relations of *similarity*. He who sees abstract 'color' in it means merely that he sees a similarity between it and all the other objects known as colors. (Similarity itself cannot ultimately be accounted for by an identical abstract element buried in all the similars, as has been already shown, p. 492 ff.) He who sees abstract paleness, intensity, purity, in the green means other similarities still. These are all outward determinations of that special green, knowledges *about* it, *zufällige Ansichten*, as Herbart would say, not *elements* of its composition. Compare the article by Meinong in the Vierteljahrschrift für wiss. Phil., xii. 324.

[2] See Vol. I, p. 221.

[3] Those who wish a fuller treatment than Martin's Human Body affords may be recommended to Bernstein's 'Five Senses of Man,' in the International Scientific Series, or to Ladd's or Wundt's Physiological Psychology. The completest compendium is L. Hermann's Handbuch der Physiologie, vol. iii.

[4] "The sensations which we *postulate* as the signs or occasions of our perceptions" (A. Seth: Scottish Philosophy, p. 89). "Their existence is *supposed* only because, without them, it would be impossible to account for the complex phenomena which are directly present in consciousness" (J. Dewey: Psychology, p. 34). Even as great an enemy of Sensation as T. H. Green has to allow it a sort of hypothetical existence under protest. "Perception presupposes feeling" (Contemp. Review, vol. xxxi. p. 747). Cf. also such passages as those in his Prolegomena to Ethics, §§ 48, 49.—Physiologically, the sensory and the reproductive or associative processes may wax and wane independently of each other. Where the part directly due to stimulation of the sense-organ preponderates, the thought has a sensational character, and differs from other thoughts in the sensational direction. Those thoughts which lie farthest in that direction we call *sensations*, for practical convenience, just as we call *conceptions* those which lie nearer the opposite extreme. But we no more have conceptions pure than we have pure sensations. Our most rarefied intellectual states involve some bodily sensibility, just as our dullest feelings have some intellectual scope. Common-sense and common psychology express this by saying that the mental state is composed of distinct fractional *parts*, one of which is sensation, the other conception. We, however, who believe every mental state to be an integral thing (Vol. I. p. 276) cannot talk thus, but must speak of the degree of sensational or intellectual character, or function, of the mental state. Professor Hering puts, as usual, his finger better upon the truth than any one else. Writing of visual perception, he says: "It is inadmissible in the present state of our knowledge to assert that first and last the same retinal picture arouses exactly the same *pure sensation*, but that this sensation, in consequence of practice and experience, is differently *interpreted* the last time, and elaborated into a different perception from the first. For the only real *data* are, on the one hand, the physical picture on the retina,—and that is both times the same; and, on the other hand, the resultant state of consciousness (*ausgeloste Empfindungscomplex*)—and that is both times distinct. *Of any third thing, namely, a pure sensation thrust between the retinal and the mental pictures, we know nothing. We can then, if we wish to avoid all hypothesis, only say that the nervous apparatus reacts upon the same stimulus differently the last*

time from the first, and that in consequence the consciousness is different too." (Hermann's Hdbch., iii. i. 567-8.)

[5] Yet even writers like Prof. Bain will deny, in the most gratuitous way, that sensations know anything. "It is evident that the lowest or most restricted form of sensation does not contain an element of knowledge. The mere state of mind called the sensation of scarlet is not knowledge, although a necessary preparation for it." 'Is not knowledge *about* scarlet' is all that Professor Bain can rightfully say.

[6] By simple ideas of sensation Locke merely means sensations.

[7] Essay c. H. U., bk. ii. ch. xxiii. § 29; ch. xxv. § 9.

[8] *Op. cit.* bk. ii. ch. ii. § 2.

[9] "So far is it from being true that we necessarily have as many feelings in consciousness at one time as there are inlets to the sense then played upon, that it is a fundamental law of pure sensation that each momentary state of the organism yields but one feeling, however numerous may be its parts and its exposures.... To this original Unity of consciousness it makes no difference that the tributaries to the single feeling are beyond the organism instead of within it, in an outside object with several sensible properties, instead of in the living body with its several sensitive functions.... The unity therefore is not made by 'association' of several components; but the plurality is formed by *dissociation* of unsuspected varieties within the unity; the substantive thing being no product of synthesis, but the residuum of differentiation." (J. Martineau: *A Study of Religion* (1888), p. 193-4.) Compare also F. H. Bradley, *Logic*, book i. chap. ii.

[10] Such passages as the following abound in anti-sensationalist literature: "Sense is a kind of dull, confused, and stupid perception obtruded upon the soul from without, whereby it perceives the alterations and motions within its own body, and takes cognizance of individual bodies existing round about it, but does not clearly comprehend what they are nor penetrate into the nature of them, it being intended by nature, as Plotinus speaks, not so properly for *knowledge* as for the *use of the body*. For the soul suffering under that which it perceives by way of *passion* cannot master or *Conquer* it, that is to say, know or understand it. For so Anaxagoras in Aristotle very fitly expresses the nature of knowledge and intellection under the notion of *Conquering*. Wherefore it is necessary, since the mind understands all things, that it should be free from mixture and passion, for this end, as Anaxagoras speaks, that it may be able to *master and conquer* its objects, that is to say, to *know and understand* them. In like manner Plotinus, in his book of *Sense and Memory*, makes to *suffer* and to *be conquered* all one, as also to *know* and to *conquer*; for which reason he concludes that that which suffers doth not know.... Sense that suffers from external objects lies as it were prostrate under them, and is overcome by them.... Sense therefore is a certain kind of drowsy and somnolent perception of that passive part of the soul which is as it were asleep in the body, and acts concretely with it.... It is an energy arising from the body and a certain kind of drowsy or sleeping life of the soul blended together with it. The perceptions of which compound, or of the soul as it were half asleep and half awake, are confused, indistinct, turbid, and encumbered cogitations very different from the energies of the noetical part,... which are free, clear, serene, satisfactory, and awakened cogitations. That is to say, knowledges." Etc., etc., etc. (R. Cudworth: *Treatise concerning Eternal and Immutable Morality*, bk. iii. chap. ii.) Similarly Malebranche: "THÉODORE.—Oh, oh, Ariste! God knows pain, pleasure, warmth, and the rest. But he does not feel these things. He knows pain, since he knows what that modification of the soul is in which pain consists. He knows it because he alone causes it in us (as I shall presently prove), and he knows what he does. In a word, he knows it because his knowledge has no bounds. But he does not feel it, for if so he would be unhappy. To know pain, then, is not to feel it. ARISTE.—That is true. But to feel it is to know it, is it not? THÉODORE.—No indeed, since God does not feel it in the least, and yet he knows it perfectly. But in order not to quibble about terms, if you will have it that to feel pain is to know it, agree at least that it is not to know it clearly, that it is not to know it by light and by evidence—in a word, that it is not to know its nature; in other words and to speak exactly, it is not to know it at all. To feel pain, for example, is to feel ourselves unhappy

without well knowing either what we are or what is this modality of our being which makes us unhappy.... Impose silence on your senses, your imagination, and your passions, and you will hear the pure voice of inner truth, the clear and evident replies of our common master. Never confound the evidence which results from the comparison of ideas with the liveliness of the sensations which touch and thrill you. The livelier our sensations and feelings (*sentiments*) are, the more darkness do they shed. The more terrible or agreeable are our phantoms, and the more body and reality they appear to have, the more dangerous are they and fit to lead us astray." (Entretiens sur la Métaphysique, 3me Entretien, *ad init.*) Malebranche's Théodore prudently does not try to explain how God's 'infinite felicity' is compatible with his not feeling joy.

[11] Green: Prolegomena, §§ 20, 28.

[12] Introd. to Hume, §§ 146, 188. It is hard to tell just what this apostolic human being but strenuously feeble writer means by relation. Sometimes it seems to stand for system of related fact. The ubiquity of the 'psychologist's fallacy' (see Vol. I p. 196) in his pages, his incessant leaning on the confusion between the thing known, the thought that knows it, and the farther things known about that thing and about that thought by later and additional thoughts, make it impossible to clear up his meaning. Compare, however, with the utterances in the text such others as these: "The waking of Self-consciousness from the sleep of sense is an absolute new beginning, and nothing can come within the 'crystal sphere' of intelligence except as it is determined by intelligence. What sense is to sense is nothing for thought. What sense is to thought, it is as determined *by* thought. There can, therefore, be no 'reality' in sensation to which the world of thought can be referred." (Edward Caird's Philosophy of Kant, 1st ed. pp. 393-4.) "When," says Green again, "feeling a pain or pleasure of heat, I perceive it to be connected with the action of approaching the fire, am I not perceiving a relation *of which one constituent, at any rate, is a simple sensation? The true answer is, No.*" "Perception, in its simplest form...—perception as the first sight or touch of an object in which nothing but what is seen or touched is recognized—*neither is nor contains sensation*" (Contemp. Rev., xxxi. pp. 746, 750.) "Mere sensation is in truth a phrase that represents no reality." "Mere feeling, then, as a matter unformed by thought, has no place in the world of facts, in the cosmos of possible experience." (Prolegomena to Ethics, §§ 46, 50.)—I have expressed myself a little more fully on this subject in Mind, x. 27 ff.

[13] Stumpf: Tonpsychologie, i. pp. 7, 8. Hobbes's phrase, *sentire semper idem et non sentire ad idem recidunt*, is generally treated as the original statement of the relativity doctrine. J. S. Mill (Examn. of Hamilton, p. 6) and Bain (Senses and Intellect, p. 321; Emotions and Will, pp. 550, 570-2; Logic, i. p. 2; Body and Mind, p. 81) are subscribers to this doctrine. Cf. also J. Mill's Analysis, J. S. Mill's edition, II. 11, 12.

[14] We can steadily hear a note for half an hour. The differences between the senses are marked. Smell and taste seem soon to get fatigued.

[15] In the popular mind it is mixed up with that entirely different doctrine of the 'Relativity of Knowledge' preached by Hamilton and Spencer. This doctrine says that our knowledge is relative *to us*, and is not of the object as the latter is in itself. It has nothing to do with the question which we have been discussing, of whether our objects of knowledge contain absolute terms or consist altogether of relations.

[16] What follows in brackets, as far as p. 27, is from the pen of my friend and pupil Mr. E. B. Delabarre.

[17] These phenomena have close analogues in the phenomena of contrast presented by the temperature-sense (see W. Preyer in Archiv f. d. ges. Phys., Bd. xxv. p. 79 ff.). Successive contrast here is shown in the fact that a warm sensation appears warmer if a cold one has just previously been experienced; and a cold one colder, if the preceding one was warm. If a finger which has been

plunged in hot water, and another which has been in cold water, be both immersed in lukewarm water, the same water appears cold to the former finger and warm to the latter. In simultaneous contrast, a sensation of warmth on any part of the skin tends to induce the sensation of cold in its immediate neighborhood; and *vice versâ*. This may be seen if we press with the palm on two metal surfaces of about an inch and a half square and three-fourths inch apart; the skin between them appears distinctly warmer. So also a small object of exactly the temperature of the palm appears warm if a cold object, and cold if a warm object, touch the skin near it.

[18] Helmholtz, *Physiolog. Optik*, p. 392.

[19] *Loc. cit.* p. 407.

[20] *Loc. cit.* p. 408.

[21] *Loc. cit.* p. 406.

[22] E. Hering, in Hermann's *Handbuch d. Physiologie*, iii. 1, p. 565.

[23] Hering: 'Zur Lehre vom Lichtsinne.'—Of these experiments the following (found on p. 24 ff.) may be cited as a typical one: "From dark gray paper cut two strips 3-4 cm. long and 1/2 cm. wide, and lay them on a background of which one half is white and the other half deep black, in such a way that one strip lies on each side of the border-line and parallel to it, and at least 1 cm. distant from it. Fixate 1/2 to 1 minute a point on the border-line between the strips. One strip appears much brighter than the other. Close and cover the eyes, and the negative after-image appears.... The difference in brightness of the strips in the after-image is in general much greater than it appeared in direct vision.... This difference in brightness of the strips by no means always increases and decreases with the difference in brightness of the two halves of the background.... A phase occurs in which the difference in brightness of the two halves of the background entirely disappears, and yet both after-images of the strips are still very clear, one of them brighter and one darker than the background, which is equally bright on both halves. Here can no longer be any question of contrast-effect, because the *conditio sine quâ non* of contrast, namely, the differing brightness of the ground, is no longer present. This proves that the different brightness of the after-images of the strips must have its ground in a different state of excitation of the corresponding portions of the retina, and from this follows further that both these portions of the retina were differently stimulated during the original observation; for the different after-effect demands here a different fore-effect.... In the original arrangement, the objectively similar strips appeared of different brightness, because both corresponding portions of the retina were truly differently excited."

[24] Helmholtz, *Physiolog. Optik*, p. 407.

[25] In *Archiv f. d. ges. Physiol.*, Bd. xli. §. 1 ff.

[26] Helmholtz, *loc. cit.* p. 412.

[27] See Hering: *Archiv f. d. ges. Physiol.*, Bd. xli. S. 358 ff.

[28] Hering: *Archiv f. d. ges. Physiol.*, Bd. xl. S. 172 ff.; Delabarre: *American Journal of Psychology*, ii. 636.

[29] Hering: *Archiv f. d. ges. Physiol.*, Bd. xli. S. 91 ff.

[30] *Die Gesichtsempfindungen u. ihre Analyse*, p. 128.

[31] Mr. Delabarre's contribution ends here.

[32] *Physiol. Psych.*, i. 351, 458-60. The full inanity of the law of relativity is best to be seen in Wundt's treatment, where the great '*allgemeiner Gesetz der Beziehung*,' invoked to account for Weber's law as well as for the phenomena of contrast and many other matters, can only be defined as

a tendency *to feel all things in relation to each other!* Bless its little soul! But why does it change the things so, when it thus feels them in relation?

[33] Ladd: *Physiol. Psych.*, p. 348.

[34] *Mind*, x. 567.

[35] *Zwangemässige Lichtempfindung durch Schall* (Leipzig, 1881).

[36] *Pflüger's Archiv*, xlii. 154.

[37] *Physiological Psychology*, 385, 387. See also such passages as that in Bain; *The Senses and the Intellect*, pp. 364-6.

[38] "Especially must we avoid all attempts, whether avowed or concealed, to account for the *spatial* qualities of the presentations of sense by merely describing the qualities of the simple sensations and the modes of their combination. It is position and extension in space which constitutes the very peculiarity of the objects as *no longer* mere sensations or affections of the mind. As sensations, they are neither *out* of ourselves nor possessed of the qualities indicated by the word spread-out." (Ladd, *op. cit.* p. 391.)

[39] A. Riehl: *Der Philosophischer Criticismus*, Bd. ii. Theil ii. p. 64.

[40] On Intelligence, part ii. bk. ii. chap. ii. §§ vii, viii. Compare such statements as these: "The consequence is that when a sensation has for its usual condition the presence of an object more or less distant from our bodies, and experience has once made us acquainted with this distance, we shall situate our sensation at this distance.—This, in fact, is the case with sensations of hearing and sight. The peripheral extremity of the acoustic nerve is in the deep-seated chamber of the ear. That of the optic nerve is in the most inner recess of the eye. But still, in our present state, we never situate our sensations of sound or color in these places, but without us, and often at a considerable distance from us.... All our sensations of color are thus projected out of our body, and clothe more or less distant objects, furniture, walls, houses, trees, the sky, and the rest. This is why, when we afterwards reflect on them, we cease to attribute them to ourselves; they are alienated and detached from us, so far as to appear different from us. Projected from the nervous surface in which we localize the majority of the others, the tie which connected them to the others and to ourselves is undone.... Thus, all our sensations are wrongly situated, and the red color is no more extended on the arm-chair than the sensation of tingling is situated at my fingers' ends. They are all situated in the sensory centres of the encephalon; all appear situated elsewhere, and a common law allots to each of them its apparent situation." (vol. ii. pp. 47-53.)—Similarly Schopenhauer: "I will now show the same by the sense of sight. The immediate *datum* is here limited to the sensation of the retina which, it is true, admits of considerable diversity, but at bottom reverts to the impression of light and dark with their shades, and that of colors. This sensation is through and through subjective, that is, inside of the organism and under the skin." (Schopenhauer: *Satz vom Grunde*, p. 58.) This philosopher then enumerates *seriatim* what the Intellect does to make the originally subjective sensation objective: 1) it turns it bottom side up; 2) it reduces its doubleness to singleness; 3) it changes its flatness to solidity; and 4) it projects it to a distance from the eye. Again: "*Sensations* are what we call the impressions on our senses, in so far as they come to our consciousness as states of our own body, especially of our nervous apparatus; we call them *perceptions* when we form out of them the representation of outer objects." (Helmholtz: *Tonempfindungen*, 1870, p. 101.)—Once more: "Sensation is always accomplished in the psychic centres, but it manifests itself at the excited part of the periphery. In other words, one is conscious of the phenomenon in the nervous centres,... but one perceives it in the peripheric organs. This phenomenon depends on the experience of the sensations themselves, in which there is a *reflection* of the subjective phenomenon and a tendency on the part of perception to return as it were to the external cause which has roused the mental state because the latter is connected with the former."

(Sergi: *Psychologie Physiologique* (Paris, 1888), p. 189.)—The clearest and best passage I know is in Liebmann: *Der Objective Anblick* (1869), pp. 67-72, but it is unfortunately too long to quote.

[41] This is proved by Weber's device of causing the head to be firmly pressed against a support by another person, whereupon the direction of traction ceases to be perceived.

[42] Lotze: *Med. Psych.*, 428-433; Lipps: *Grundtatsachen des Seelenlebens*, 582.

[43] *Injuries to Nerves* (Philadelphia, 1872), p. 350 ff.

[44] In reality it probably means only a restless movement of desire, which he might make even after he had become aware of his impotence to touch the object.

[45] *Revue Philosophique*, vii. p. 1 ff., an admirable critical article, in the course of which M. Janet gives a bibliography of the cases in question. See also Dunan: *ibid.* xxv. 165-7. They are also discussed and similarly interpreted by T. K. Abbot: *Sight and Touch* (1864), chapter x.

[46] The intermediary and shortened locations of the lost hand and foot in the amputation cases also show this. It is easy to see why the phantom foot might continue to follow the position of the artificial one. But I confess that I cannot explain its half way-positions.

[47] It is from this confused assumption that the time-honored riddle comes, of how, with an upside-down picture on the retina, we can see things right-side up. Our consciousness is *naïvely* supposed to inhabit the picture and to feel the picture's position as related to other objects of space. But the truth is that the picture is non-existent either as a habitat or as anything else, for immediate consciousness. Our notion of it is an enormously late conception. The outer object is given immediately with all those qualities which later are named and determined in relation to other sensations. The 'bottom' of this object is where we see what by touch we afterwards know as our *feet*, the 'top' is the place in which we see what we know as other people's heads, etc., etc. Berkeley long ago made this matter perfectly clear (see his *Essay towards a new Theory of Vision*, §§ 93-98, 113-118).

[48] For full justification the reader must see the next chapter. He may object, against the summary account given now, that in a babe's immediate field of vision the various things which appear are located *relatively to each other* from the outset. I admit that *if discriminated*, they would appear so located. But they are parts of the content of one sensation, not sensations separately experienced, such as the text is concerned with. The fully developed 'world,' in which all our sensations ultimately find location, is nothing but an imaginary object framed after the pattern of the field of vision, by the addition and continuation of one sensation upon another in an orderly and systematic way. In corroboration of my text I must refer to pp. 57-60 of Riehl's book quoted above on [page 32](#), and to Uphues: *Wahrnehmung und Empfindung* (1888), especially the *Einleitung* and pp. 51-61.

CHAPTER XVIII.

IMAGINATION.

Sensations, once experienced, modify the nervous organism, so that copies of them arise again in the mind after the original outward stimulus is gone.

No mental copy, however, can arise in the mind, of any kind of sensation which has never been directly excited from without.

The blind may dream of sights, the deaf of sounds, for years after they have lost their vision or hearing;^[49] but the man *born* deaf can never be made to imagine what sound is like, nor can the man *born* blind ever have a mental vision. In Locke's words, already quoted, "the mind can frame unto itself no one new simple idea." The originals of them all must have been given from without. Fantasy, or Imagination, are the names given to the faculty of reproducing copies of originals once felt. The imagination is called 'reproductive' when the copies are literal; 'productive' when elements from different originals are recombined so as to make new wholes.

After-images belong to sensation rather than to imagination; so that the most immediate phenomena of imagination would seem to be those tardier images (due to what the Germans call *Sinnesgedächtniss*) which were spoken of in Vol. I, p. 617,—coercive hauntings of the mind by echoes of unusual experiences for hours after the latter have taken place. The phenomena ordinarily ascribed to imagination, however, are those mental pictures of possible sensible experiences, to which the ordinary processes of associative thought give rise.

When represented with surroundings concrete enough to constitute a *date*, these pictures, when they revive, form *recollections*. We have already studied the machinery of recollection in Chapter XVI. When the mental pictures are of data freely combined, and reproducing no past combination exactly, we have acts of imagination properly so called.

OUR IMAGES ARE USUALLY VAGUE.

For the ordinary 'analytic' psychology, each sensibly discernible element of the object imagined is represented by its own separate idea, and the total object is imagined by a 'cluster' or 'gang' of ideas. We have seen abundant reason to reject this view (see Vol. I, p. 276 ff.). An imagined object, however complex, is at any one moment thought in one idea, which is aware of all its qualities together. If I slip into the ordinary way of talking, and speak of various ideas 'combining,' the reader will understand that this

is only for popularity and convenience, and he will not construe it into a concession to the atomistic theory in psychology.

Hume was the hero of the atomistic theory. Not only were ideas copies of original impressions made on the sense-organs, but they were, according to him, completely adequate copies, and were all so separate from each other as to possess no manner of connection. Hume proves ideas in the imagination to be completely adequate copies, not by appeal to observation, but by *a priori* reasoning, as follows:

"The mind cannot form any notion of quantity or quality, without forming a precise notion of the degrees of each," for "'tis confessed that no object can appear to the senses; or in other words, that no impression^[50] can become present to the mind, without being determined in its degrees both of quantity and quality. The confusion in which impressions are sometimes involved proceeds only from their faintness and unsteadiness, not from any capacity in the mind to receive any impression, which in its real existence has no particular degree nor proportion. That is a contradiction in terms; and even implies the flattest of all contradictions, *viz.*, that 'tis possible for the same thing both to be and not to be. Now since all ideas are derived from impressions, and are nothing but copies and representations of them, whatever is true of the one must be acknowledged concerning the other. Impressions and ideas differ only in their strength and vivacity. The foregoing conclusion is not founded on any particular degree of vivacity. It cannot therefore be affected by any variation in that particular. An idea is a weaker impression; and as a strong impression must necessarily have a determinate quantity and quality, the case must be the same with its copy or representative."^[51]

The slightest introspective glance will show to anyone the falsity of this opinion. Hume surely had images of his own works without seeing distinctly every word and letter upon the pages which floated before his mind's eye. His dictum is therefore an exquisite example of the way in which a man will be blinded by *a priori* theories to the most flagrant facts. It is a rather remarkable thing, too, that the psychologists of Hume's own empiricist school have, as a rule, been more guilty of this blindness than their opponents. The fundamental *facts* of consciousness have been, on the

whole, more accurately reported by the spiritualistic writers. None of Hume's pupils, so far as I know, until Taine and Huxley, ever took the pains to contradict the opinion of their master. Prof. Huxley in his brilliant little work on Hume set the matter straight in the following words:

"When complex impressions or complex ideas are reproduced as memories, it is probable that the copies never give all the details of the originals with perfect accuracy, and it is certain that they rarely do so. No one possesses a memory so good, that if he has only once observed a natural object, a second inspection does not show him something that he has forgotten. Almost all, if not all, our memories are therefore sketches, rather than portraits, of the originals—the salient features are obvious, while the subordinate characters are obscure or unrepresented.

"Now, when several complex impressions which are more or less different from one another—let us say that out of ten impressions in each, six are the same in all, and four are different from all the rest—are successively presented to the mind, it is easy to see what must be the nature of the result. The repetition of the six similar impressions will strengthen the six corresponding elements of the complex idea, which will therefore acquire greater vividness; while the four differing impressions of each will not only acquire no greater strength than they had at first, but, in accordance with the law of association, they will all tend to appear at once, and will thus neutralize one another.

"This mental operation may be rendered comprehensible by considering what takes place in the formation of compound photographs—when the images of the faces of six sitters, for example, are each received on the same photographic plate, for a sixth of the time requisite to take one portrait. The final result is that all those points in which the six faces agree are brought out strongly, while all those in which they differ are left vague; and thus what may be termed a *generic* portrait of the six, in contradistinction to a *specific* portrait of any one, is produced.

"Thus our ideas of single complex impressions are incomplete in one way, and those of numerous, more or less similar, complex impressions are incomplete in another way; that is to say, they are *generic*, not

specific. And hence it follows that our ideas of the impressions in question are not, in the strict sense of the word, copies of those impressions; while, at the same time, they may exist in the mind independently of language.

"The generic ideas which are formed from several similar, but not identical, complex experiences are what are called *abstract* or *general* ideas; and Berkeley endeavored to prove that all general ideas are nothing but particular ideas annexed to a certain term, which gives them a more extensive signification, and makes them recall, upon occasion, other individuals which are similar to them. Hume says that he regards this as 'one of the greatest and the most valuable discoveries that has been made of late years in the republic of letters,' and endeavors to confirm it in such a manner that it shall be 'put beyond all doubt and controversy.'

"I may venture to express a doubt whether he has succeeded in his object; but the subject is an abstruse one; and I must content myself with the remark, that though Berkeley's view appears to be largely applicable to such general ideas as are formed after language has been acquired, and to all the more abstract sort of conceptions, yet that general ideas of sensible objects may nevertheless be produced in the way indicated, and may exist independently of language. In dreams, one sees houses, trees, and other objects, which are perfectly recognizable as such, but which remind one of the actual objects as seen 'out of the corner of the eye,' or of the pictures thrown by a badly-focussed magic lantern. A man addresses us who is like a figure seen in twilight; or we travel through countries where every feature of the scenery is vague; the outlines of the hills are ill-marked, and the rivers have no defined banks. They are, in short, generic ideas of many past impressions of men, hills, and rivers. An anatomist who occupies himself intently with the examination of several specimens of some new kind of animal, in course of time acquires so vivid a conception of its form and structure that the idea may take visible shape and become a sort of waking dream. But the figure which thus presents itself is generic, not specific. It is no copy of any one specimen, but, more or less, a mean of the series; and there seems no reason to doubt that the

minds of children before they learn to speak, and of deaf-mutes, are peopled with similarly generated generic ideas of sensible objects."^[52]

Are Vague Images 'Abstract Ideas'?

The only point which I am tempted to criticise in this account is Prof. Huxley's *identification of these generic images with 'abstract or general ideas' in the sense of universal conceptions*. Taine gives the truer view. He writes:

"Some years ago I saw in England, in Kew Gardens, for the first time, araucarias, and I walked along the beds looking at these strange plants, with their rigid bark and compact, short, scaly leaves, of a sombre green, whose abrupt, rough, bristling form cut in upon the fine softly-lighted turf of the fresh grass-plat. If I now inquire what this experience has left in me, I find, first, the sensible representation of an araucaria; in fact, I have been able to describe almost exactly the form and color of the plant. But there is a difference between this representation and the former sensations, of which it is the present echo. The internal semblance, from which I have just made my description, is vague, and my past sensations were precise. For, assuredly, each of the araucarias I saw then excited in me a distinct visual sensation; there are no two absolutely similar plants in nature; I observed perhaps twenty or thirty araucarias; without a doubt each one of them differed from the others in size, in girth, by the more or less obtuse angles of its branches, by the more or less abrupt jutting out of its scales, by the style of its texture; consequently, my twenty or thirty visual sensations were different. But no one of these sensations has completely survived in its echo; the twenty or thirty revivals have blunted one another; thus upset and agglutinated by their resemblance they are confounded together, and my present representation is their residue only. This is the product, or rather the fragment, which is deposited in us, when we have gone through a series of similar facts or individuals. Of our numerous experiences there remain on the following day four or five more or less distinct recollections, which, obliterated themselves, leave behind in us a simple colorless, vague representation, into which enter as components various reviving

sensations, in an utterly feeble, incomplete, and abortive state.—*But this representation is not the general and abstract idea. It is but its accompaniment*, and, if I may say so, the ore from which it is extracted. For the representation, though badly sketched, is a sketch, the sensible sketch of a distinct individual.... But my abstract idea corresponds to the whole class; it differs, then, from the representation of an individual.—Moreover, my abstract idea is perfectly clear and determinate; now that I possess it, I never fail to recognize an araucaria among the various plants which may be shown me; it differs then from the confused and floating representation I have of some particular araucaria."^[53]

In other words, a blurred picture is just as much a single mental fact as a sharp picture is; and *the use of either picture by the mind to symbolize a whole class of individuals is a new mental function*, requiring some other modification of consciousness than the mere perception that the picture is distinct or not. I may bewail the indistinctness of my mental image of my absent friend. That does not prevent my thought from meaning *him* alone, however. And I may mean all mankind, with perhaps a very sharp image of one man in my mind's eye. The meaning is a function of the more 'transitive' parts of consciousness, the 'fringe' of relations which we feel surrounding the image, be the latter sharp or dim. This was explained in a previous place (see Vol. I, p. 473 ff., especially the note to page 477), and I would not touch upon the matter at all here but for its historical interest.

Our ideas or images of past sensible experiences may then be either distinct and adequate or dim, blurred, and incomplete. It is likely that the different degrees in which different men are able to make them sharp and complete has had something to do with keeping up such philosophic disputes as that of Berkeley with Locke over abstract ideas. Locke had spoken of our possessing 'the general idea of a triangle' which "must be neither oblique nor rectangle, neither equilateral, equicrural, nor scalenon, but all and none of these at once." Berkeley says:

"If any man has the faculty of framing in his mind such an idea of a triangle as is here described, it is in vain to pretend to dispute him out of it, nor would I go about it. All I desire is that the reader would fully and certainly inform himself whether *he* has such an idea or no."^[54]

Until very recent years it was supposed by all philosophers that there was a typical human mind which all individual minds were like, and that propositions of universal validity could be laid down about such faculties as 'the Imagination.' Lately, however, a mass of revelations have poured in, which make us see how false a view this is. There are imaginations, not 'the Imagination,' and they must be studied in detail.

INDIVIDUALS DIFFER IN IMAGINATION.

The first breaker of ground in this direction was Fechner, in 1860. Fechner was gifted with unusual talent for subjective observation, and in chapter xliv of his 'Psychophysik' he gave the results of a most careful comparison of his own optical after-images, with his optical memory-pictures, together with accounts by several other individuals of their optical memory-pictures. [55] The result was to show a great personal diversity. "It would be interesting," he writes, "to work up the subject statistically; and I regret that other occupations have kept me from fulfilling my earlier intention to proceed in this way."

Flechner's intention was independently executed by Mr. Galton, the publication of whose results in 1880 may be said to have made an era in descriptive Psychology.

"It is not necessary," says Galton, "to trouble the reader with my early tentative steps. After the inquiry had been fairly started it took the form of submitting a certain number of printed questions to a large number of persons. There is hardly any more difficult task than that of framing questions which are not likely to be misunderstood, which admit of easy reply, and which cover the ground of inquiry. I did my best in these respects, without forgetting the most important part of all—namely, to tempt my correspondents to write freely in fuller explanation of their replies, and on cognate topics as well. These separate letters have proved more instructive and interesting by far than the replies to the set questions.

"The first group of the rather long series of queries related to the illumination, definition, and coloring of the mental image, and were framed thus:

"Before addressing yourself to any of the Questions on the opposite page, think of some definite object—suppose it is your breakfast-table as you sat down to it this morning—and consider carefully the picture that rises before your mind's eye.

"1. *Illumination*.—Is the image dim or fairly clear? Is its brightness comparable to that of the actual scene?

"2. *Definition*.—Are all the objects pretty well defined at the same time, or is the place of sharpest definition at any one moment more contracted than it is in a real scene?

"3. *Coloring*.—Are the colors of the china, of the toast, bread-crust, mustard, meat, parsley, or whatever may have been on the table, quite distinct and natural?'

"The earliest results of my inquiry amazed me. I had begun by questioning friends in the scientific world, as they were the most likely class of men to give accurate answers concerning this faculty of visualizing, to which novelists and poets continually allude, which has left an abiding mark on the vocabularies of every language, and which supplies the material out of which dreams and the well-known hallucinations of sick people are built.

"To my astonishment, I found that *the great majority of the men of science to whom I first applied protested that mental imagery was unknown to them*, and they looked on me as fanciful and fantastic in supposing that the words 'mental imagery' really expressed what I believed everybody supposed them to mean. They had no more notion of its true nature than a color-blind man, who has not discerned his defect, has of the nature of color. They had a mental deficiency of which they were unaware, and naturally enough supposed that those who affirmed they possessed it were romancing. To illustrate their mental attitude it will be sufficient to quote a few lines from the letter of one of my correspondents, who writes:

"These questions presuppose assent to some sort of a proposition regarding the "mind's eye," and the "images" which it sees.... This points to some initial fallacy.... It is only by a figure of speech that I can describe my recollection of a scene as a "mental image" which I

can "see" with my "mind's eye."... I do not see it... any more than a man sees the thousand lines of Sophocles which under due pressure he is ready to repeat. The memory possesses it,' etc.

"Much the same result followed inquiries made for me by a friend among members of the French Institute.

"On the other hand, when I spoke to persons whom I met *in general society*, I found an entirely different disposition to prevail. *Many men and a yet larger number of women, and many boys and girls, declared that they habitually saw mental imagery, and that it was perfectly distinct to them and full of color.* The more I pressed and cross-questioned them, professing myself to be incredulous, the more obvious was the truth of their first assertions. They described their imagery in minute detail, and they spoke in a tone of surprise at my apparent hesitation in accepting what they said. I felt that I myself should have spoken exactly as they did if I had been describing a scene that lay before my eyes, in broad daylight, to a blind man who persisted in doubting the reality of vision. Reassured by this happier experience, I recommenced to inquire among scientific men, and soon found scattered instances of what I sought, though in by no means the same abundance as elsewhere. I then circulated my questions more generally among my friends and through their hands, and obtained replies... from persons of both sexes, and of various ages, and in the end from occasional correspondents in nearly every civilized country.

"I have also received batches of answers from various educational establishments both in England and America, which were made after the masters had fully explained the meaning of the questions, and interested the boys in them. These have the merit of returns derived from a general census, which my other data lack, because I cannot for a moment suppose that the writers of the latter are a haphazard proportion of those to whom they were sent. Indeed I know of some who, disavowing all possession of the power, and of many others who, possessing it in too faint a degree to enable them to express what their experiences really were, in a manner satisfactory to themselves, sent no returns at all. Considerable statistical similarity was, however, observed between the sets of returns furnished by the schoolboys and those sent by my separate correspondents, and I may add that they

accord in this respect with the oral information I have elsewhere obtained. The conformity of replies from so many different sources which was clear from the first, the fact of their apparent trustworthiness being on the whole much increased by cross-examination (though I could give one or two amusing instances of break-down), and the evident effort made to give accurate answers, have convinced me that it is a much easier matter than I had anticipated to obtain trustworthy replies to psychological questions. Many persons, especially women and intelligent children, take pleasure in introspection, and strive their very best to explain their mental processes. I think that a delight in self-dissection must be a strong ingredient in the pleasure that many are said to take in confessing themselves to priests.

"Here, then, are two rather notable results: the one is the proved facility of obtaining statistical insight into the processes of other persons' minds, whatever *a priori* objection may have been made as to its possibility; and the other is that scientific men, as a class, have feeble powers of visual representation. There is no doubt whatever on the latter point, however it may be accounted for. My own conclusion is that an over-ready perception of sharp mental pictures is antagonistic to the acquirement of habits of highly-generalized and abstract thought, especially when the steps of reasoning are carried on by words as symbols, and that if the faculty of seeing the pictures was ever possessed by men who think hard, it is very apt to be lost by disuse. The highest minds are probably those in which it is not lost, but subordinated, and is ready for use on suitable occasions. I am, however, bound to say that the missing faculty seems to be replaced so serviceably by other modes of conception, chiefly, I believe, connected with the incipient motor sense, not of the eyeballs only but of the muscles generally, that *men who declare themselves entirely deficient in the power of seeing mental pictures can nevertheless give lifelike descriptions* of what they have seen, and can otherwise express themselves as if they were gifted with a vivid visual imagination. *They can also become painters of the rank of Royal Academicians....* [56]

"It is a mistake to suppose that sharp sight is accompanied by clear visual memory. I have not a few instances in which the independence

of the two faculties is emphatically commented on; and I have at least one clear case where great interest in outlines and accurate appreciation of straightness, squareness, and the like, is unaccompanied by the power of visualizing. Neither does the faculty go with dreaming. I have cases where it is powerful, and at the same time where dreams are rare and faint or altogether absent. One friend tells me that his dreams have not the hundredth part of the vigor of his waking fancies.

"The visualizing and the identifying powers are by no means necessarily combined. A distinguished writer on metaphysical topics assures me that he is exceptionally quick at recognizing a face that he has seen before, but that he cannot call up a mental image of any face with clearness.

"Some persons have the power of combining in a single perception more than can be seen at any one moment by the two eyes....

"I find that a few persons can, by what they often describe as a kind of touch-sight, visualize at the same moment all round the image of a solid body. Many can do so nearly, but not altogether round that of a terrestrial globe. An eminent mineralogist assures me that he is able to imagine simultaneously all the sides of a crystal with which he is familiar. I may be allowed to quote a curious faculty of my own in respect to this. It is exercised only occasionally and in dreams, or rather in nightmares, but under those circumstances I am perfectly conscious of embracing an entire sphere in a single perception. It appears to lie within my mental eyeball, and to be viewed centripetally.

"This power of comprehension is practically attained in many cases by indirect methods. It is a common feat to take in the whole surroundings of an imagined room with such a rapid mental sweep as to leave some doubt whether it has not been viewed simultaneously. Some persons have the habit of viewing objects as though they were partly transparent; thus, if they so dispose a globe in their imagination as to see both its north and south poles at the same time, they will not be able to see its equatorial parts. They can also perceive all the rooms of an imaginary house by a single mental glance, the walls and floors being as if made of glass. A fourth class of persons have the habit of

recalling scenes, not from the point of view whence they were observed, but from a distance, and they visualize their own selves as actors on the mental stage. By one or other of these ways, the power of seeing the whole of an object, and not merely one aspect of it, is possessed by many persons.

"The place where the image appears to lie differs much. Most persons see it in an indefinable sort of way, others see it in front of the eye, others at a distance corresponding to reality. There exists a power which is rare naturally, but can, I believe, be acquired without much difficulty, of projecting a mental picture upon a piece of paper, and of holding it fast there, so that it can be outlined with a pencil. To this I shall recur.

"Images usually do not become stronger by dwelling on them; the first idea is commonly the most vigorous, but this is not always the case. Sometimes the mental view of a locality is inseparably connected with the sense of its position as regards the points of the compass, real or imaginary. I have received full and curious descriptions from very different sources of this strong geographical tendency, and in one or two cases I have reason to think it allied to a considerable faculty of geographical comprehension.

"The power of visualizing is higher in the female sex than in the male, and is somewhat, but not much, higher in public-school boys than in men. After maturity is reached, the further advance of age does not seem to dim the faculty, but rather the reverse, judging from numerous statements to that effect; but advancing years are sometimes accompanied by a growing habit of hard abstract thinking, and in these cases—not uncommon among those whom I have questioned—the faculty undoubtedly becomes impaired. There is reason to believe that it is very high in some young children, who seem to spend years of difficulty in distinguishing between the subjective and objective world. Language and book-learning certainly tend to dull it.

"The visualizing faculty is a natural gift, and, like all natural gifts, has a tendency to be inherited. In this faculty the tendency to inheritance is exceptionally strong, as I have abundant evidence to prove, especially in respect to certain rather rare peculiarities,... which, when they exist

at all, are usually found among two, three, or more brothers and sisters, parents, children, uncles and aunts, and cousins.

"Since families differ so much in respect to this gift, we may suppose that races would also differ, and there can be no doubt that such is the case. I hardly like to refer to civilized nations, because their natural faculties are too much modified by education to allow of their being appraised in an off-hand fashion. I may, however, speak of the French, who appear to possess the visualizing faculty in a high degree. The peculiar ability they show in prearranging ceremonials and *fêtes* of all kinds, and their undoubted genius for tactics and strategy, show that they are able to foresee effects with unusual clearness. Their ingenuity in all technical contrivances is an additional testimony in the same direction, and so is their singular clearness of expression. Their phrase 'figurez-vous,' or 'picture to yourself,' seems to express their dominant mode of perception. Our equivalent of 'imagine' is ambiguous.

"I have many cases of persons mentally reading off scores when playing the pianoforte, or manuscript when they are making speeches. One statesman has assured me that a certain hesitation in utterance which he has at times is due to his being plagued by the image of his manuscript speech with its original erasures and corrections. He cannot lay the ghost, and he puzzles in trying to decipher it.

"Some few persons see mentally in print every word that is uttered; they attend to the visual equivalent and not to the sound of the words, and they read them off usually as from a long imaginary strip of paper, such as is unwound from telegraphic instruments."

The reader will find further details in Mr. Galton's 'Inquiries into Human Faculty,' pp. 83-114.^[57] I have myself for many years collected from each and all of my psychology-students descriptions of their own visual imagination; and found (together with some curious idiosyncrasies) corroboration of all the variations which Mr. Galton reports. As examples, I subjoin extracts from two cases near the ends of the scale. The writers are

first cousins, grandsons of a distinguished man of science. The one who is a good visualizer says:

"This morning's breakfast-table is both dim and bright; it is dim if I try to think of it when my eyes are open upon any object; it is perfectly clear and bright if I think of it with my eyes closed.—All the objects are clear at once, yet when I confine my attention to any one object it becomes far more distinct.—I have more power to recall color than any other one thing: if, for example, I were to recall a plate decorated with flowers I could reproduce in a drawing the exact tone, etc. The color of anything that was on the table is perfectly vivid.—There is very little limitation to the extent of my images: I can see all four sides of a room, I can see all four sides of two, three, four, even more rooms with such distinctness that if you should ask me what was in any particular place in any one, or ask me to count the chairs, etc., I could do it without the least hesitation.—The more I learn by heart the more clearly do I see images of my pages. Even before I can recite the lines I see them so that I could give them very slowly word for word, but my mind is so occupied in looking at my printed image that I have no idea of what I am saying, of the sense of it, etc. When I first found myself doing this I used to think it was merely because I knew the lines imperfectly; but I have quite convinced myself that I really do see an image. The strongest proof that such is really the fact is, I think, the following:

"I can look down the mentally seen page and see the words that *commence* all the lines, and from any one of these words I can continue the line. I find this much easier to do if the words begin in a straight line than if there are breaks. Example:

Étant fait....

Tous....

A des....

Que fit....

Céres....

Avec....

Un fleur....

Comme....
(*La Fontaine* 8. iv.)"

The poor visualizer says:

"My ability to form mental images seems, from what I have studied of other people's images, to be defective, and somewhat peculiar. The process by which I seem to remember any particular event is not by a series of distinct images, but a sort of panorama, the faintest impressions of which are perceptible through a thick fog.—I cannot shut my eyes and get a distinct image of anyone, although I used to be able to a few years ago, and the faculty seems to have gradually slipped away.—In my most vivid dreams, where the events appear like the most real facts, I am often troubled with a dimness of sight which causes the images to appear indistinct.—To come to the question of the breakfast-table, there is nothing definite about it. Everything is vague. I cannot say *what* I see. I could not possibly count the chairs, but I happen to know that there are ten. I see nothing in detail.—The chief thing is a general impression that I cannot tell exactly what I do see. The coloring is about the same, as far as I can recall it, only very much washed out. Perhaps the only color I can see at all distinctly is that of the table-cloth, and I could probably see the color of the wall-paper if I could remember what color it was."

A person whose visual imagination is strong finds it hard to understand how those who are without the faculty can think at all. *Some people undoubtedly have no visual images at all worthy of the name,*^[58] and instead of *seeing* their breakfast-table, they tell you that they *remember* it or *know* what was on it. This knowing and remembering takes place undoubtedly by means of verbal images, as was explained already in Chapter IX, pp. 265-6.

The study of Aphasia (see Vol. I, p. 54) *has of late years shown how unexpectedly great are the differences between individuals in respect of imagination.* And at the same time the discrepancies between lesion and symptom in different cases of the disease have been largely cleared up. In

some individuals the habitual 'thought-stuff,' if one may so call it, is visual; in others it is auditory, articulatory, or motor; in most, perhaps, it is evenly mixed. The same local cerebral injury must needs work different practical results in persons who differ in this way. In one it will throw a much-used brain-tract out of gear; in the other it may affect an unimportant region. A particularly instructive case was published by Charcot in 1883.^[59] The patient was

Mr. X., a merchant, born in Vienna, highly educated, master of German, Spanish, French, Greek, and Latin. Up to the beginning of the malady which took him to Professor Charcot, he read Homer at sight. He could, starting from any verse out of the first book of the Iliad, repeat the following verses without hesitating, by heart. Virgil and Horace were familiar. He also knew enough of modern Greek for business purposes. Up to within a year (from the time Charcot saw him) he enjoyed an exceptional *visual* memory. He no sooner thought of persons or things, but features, forms, and colors arose with the same clearness, sharpness, and accuracy as if the objects stood before him. When he tried to recall a fact or a figure in his voluminous polyglot correspondence, the letters themselves appeared before him with their entire content, irregularities, erasures and all. At school he recited from a mentally seen page which he read off line by line and letter by letter. In making computations, he ran his mental eye down imaginary columns of figures, and performed in this way the most varied operations of arithmetic. He could never think of a passage in a play without the entire scene, stage, actors, and audience appearing to him. He had been a great traveller. Being a good draughtsman, he used to sketch views which pleased him; and his memory always brought back the entire landscape exactly. If he thought of a conversation, a saying, an engagement, the place, the people, the entire scene rose before his mind.

His *auditory memory* was always deficient, or at least secondary. He had no taste for music.

A year and a half previous to examination, after business-anxieties, loss of sleep, appetite, etc., he noticed suddenly one day an extraordinary change in himself. After complete confusion, there came

a violent contrast between his old and his new state. Everything about him seemed so new and foreign that at first he thought he must be going mad. He was nervous and irritable. Although he saw all things distinct, he had entirely lost his memory for forms and colors. On ascertaining this, he became reassured as to his sanity. He soon discovered that he could carry on his affairs by using his memory in an altogether new way. He can now describe clearly the difference between his two conditions.

Every time he returns to A., from which place business often calls him, he seems to himself as if entering a strange city. He views the monuments, houses, and streets with the same surprise as if he saw them for the first time. Gradually, however, his memory returns, and he finds himself at home again. When asked to describe the principal public place of the town, he answered, "I know that it is there, but it is impossible to imagine it, and I can tell you nothing about it." He has often drawn the port of A. To-day he vainly tries to trace its principal outlines. Asked to draw a minaret, he reflects, says it is a square tower, and draws, rudely, four lines, one for ground, one for top, and two for sides. Asked to draw an arcade, he says, "I remember that it contains semi-circular arches, and that two of them meeting at an angle make a vault, but how it *looks* I am absolutely unable to imagine." The profile of a man which he drew by request was as if drawn by a little child; and yet he confessed that he had been helped to draw it by looking at the bystanders. Similarly he drew a shapeless scribble for a tree.

He can no more remember his wife's and children's faces than he can remember the port of A. Even after being with them some time they seem unusual to him. He forgets his own face, and once spoke to his image in a mirror, taking it for a stranger. He complains of his loss of feeling for colors. "My wife has black hair, this I know; but I can no more recall its color than I can her person and features." This visual amnesia extends to dating objects from his childhood's years—paternal mansion, etc., forgotten.

No other disturbances but this loss of visual images. Now when he seeks something in his correspondence, he must rummage among the letters like other men, until he meets the passage. He can recall only the first few verses of the Iliad, and must *grope* to read Homer, Virgil,

and Horace. Figures which he adds he must now whisper to himself. He realises clearly that he must help his memory out with auditory images, which he does with effort. *The words and expressions which he recalls seem now to echo in his ear; an altogether novel sensation for him.* If he wishes to learn by heart anything, a series of phrases for example, he must *read them several times aloud*, so as to impress his ear. When later he repeats the thing in question, the sensation of inward hearing which precedes articulation rises up in his mind. This feeling was formerly unknown to him. He speaks French fluently; but affirms that he can no longer think in French; but must get his French words by translating them from Spanish or German, the languages of his childhood. He dreams no more in visual terms, but only in words, usually Spanish words. A certain degree of verbal blindness affects him—he is troubled by the Greek alphabet, etc.^[60]

If this patient had possessed the auditory type of imagination from the start, it is evident that the injury, whatever it was, to his centres for optical imagination, would have affected his practical life much less profoundly.

"*The auditory type,*" says M. A. Binet,^[61] "*appears to be rarer than the visual.* Persons of this type imagine what they think of in the language of sound. In order to remember a lesson they impress upon their mind, not the look of the page, but the sound of the words. They reason, as well as remember, by ear. In performing a mental addition they repeat verbally the names of the figures, and add, as it were, the sounds, without any thought of the graphic signs. Imagination also takes the auditory form. 'When I write a scene,' said Legouvé to Scribe, 'I *hear*; but you *see*. In each phrase which I write, the voice of the personage who speaks strikes my ear. *Vous, qui êtes le théâtre même*, your actors walk, gesticulate before your eyes; I am a *listener*, you a *spectator*.'—'Nothing more true,' said Scribe; 'do you know where I am when I write a piece? In the middle of the parterre.' It is clear that the *pure audile*, seeking to develop only a single one of his faculties, may, like the pure visualizer, perform astounding feats of memory—Mozart, for example, noting from memory the *Miserere* of the Sistine Chapel after two hearings; the deaf Beethoven, composing and inwardly repeating his enormous symphonies. On the other hand,

the man of auditory type, like the visual, is exposed to serious dangers; for if he lose his auditory images, he is without resource and breaks down completely.

"It is possible that persons with hallucinations of hearing, and individuals afflicted with the mania that they are victims of persecution, may all belong to the auditory type; and that the predominance of a certain kind of imagination may predispose to a certain order of hallucinations, and perhaps of delirium.

"The *motor type* remains—perhaps the most interesting of all, and certainly the one of which least is known. Persons who belong to this type [*les moteurs*, in French, *motiles*, as Mr. Galton proposes to call them in English] make use, in memory, reasoning, and all their intellectual operations, of images derived from movement. In order to understand this important point, it is enough to remember that 'all our perceptions, and in particular the important ones, those of sight and touch, contain as integral elements the movements of our eyes and limbs; and that, if movement is ever an essential factor in our really seeing an object, it must be an equally essential factor when we see the same object in imagination' (Ribot).^[62] For example, the complex impression of a ball, which is there, in our hand, is the resultant of optical impressions of touch, of muscular adjustments of the eye, of the movements of our fingers, and of the muscular sensations which these yield. When we imagine the ball, its idea must include the images of these muscular sensations, just as it includes those of the retinal and epidermal sensations. They form so many *motor images*. If they were not earlier recognized to exist, that is because our knowledge of the muscular sense is relatively so recent. In older psychologies it never was mentioned, the number of senses being restricted to five.

"There are persons who remember a drawing better when they have followed its outlines with their finger. Lecoq de Boisbaudran used this means in his artistic teaching, in order to accustom his pupils to draw

from memory. He made them follow the outlines of figures with a pencil held in the air, forcing them thus to associate muscular with visual memory. Galton quotes a curious corroborative fact. Colonel Moncrieff often observed in North America young Indians who, visiting occasionally his quarters, interested themselves greatly in the engravings which were shown them. One of them followed with care with the point of his knife the outline of a drawing in the Illustrated London News, saying that this was to enable him to carve it out the better on his return home. In this case the motor images were to reinforce the visual ones. The young savage was a *motor*....^[63] When one's motor images are destroyed, one loses one's remembrance of movements, and sometimes, more curiously still, one loses the power of executing them. Pathology gives us examples in motor aphasia, agraphia, etc. Take the case of agraphia. An educated man, knowing how to write, suddenly loses this power, as a result of cerebral injury. His hand and arm are in no way paralytic, yet he cannot write. Whence this loss of power? He tells us himself: he no longer knows how. He has forgotten how to set about it to trace the letters, he has lost the memory of the movements to be executed, he has no longer the motor images which, when formerly he wrote, directed his hand.... Other patients, affected with word-blindness, resort to these motor images precisely to make amends for their other deficiency.... An individual affected in this way cannot read letters which are placed before his eyes, even although his sight be good enough for the purpose. This loss of the power of reading by sight may, at a certain time, be the only trouble the patient has. Individuals thus mutilated succeed in reading by an ingenious roundabout way which they often discover themselves: it is enough that they should trace the letters with their finger to understand their sense. What happens in such a case? How can the hand supply the place of the eye? The motor image gives the key to the problem. If the patient can read, so to speak, with his fingers, it is because in tracing the letters he gives himself a certain number of muscular impressions which are those of writing. In one word, the patient reads by writing (Charcot): the feeling of the graphic movements suggests the sense of what is being written as well as sight would."^[64]

The imagination of a blind-deaf mute like Laura Bridgman must be confined entirely to tactile and motor material. *All blind persons must belong to the 'tactile' and 'motile' types* of the French authors. When the young man whose cataracts were removed by Dr. Franz was shown different geometric figures, he said he "had not been able to form from them the idea of a square and a disk until he perceived a sensation of what he saw in the points of his fingers, as if he really touched the objects."^[65]

Professor Stricker of Vienna, who seems to have the motile form of imagination developed in unusual strength, has given a very careful analysis of his own case in a couple of monographs with which all students should become familiar.^[66] His recollections both of his own movements and of those of other things are accompanied invariably by distinct muscular feelings in those parts of his body which would naturally be used in effecting or in following the movement. In thinking of a soldier marching, for example, it is as if he were helping the image to march by marching himself in his rear. And if he suppresses this sympathetic feeling in his own legs, and concentrates all his attention on the imagined soldier, the latter becomes, as it were, paralyzed. In general his imagined movements, of whatsoever objects, seem paralyzed the moment no feelings of movement either in his own eyes or in his own limbs accompany them.^[67] The movements of articulate speech play a predominant part in his mental life.

"When after my experimental work I proceed to its description, as a rule I reproduce in the first instance only words, which I had already associated with the perception of the various details of the observation whilst the latter was going on. For speech plays in all my observing so important a part that I ordinarily clothe phenomena in words as fast as I observe them."^[68]

Most persons, on being asked *in what sort of terms they imagine words*, will say 'in terms of hearing.' It is not until their attention is expressly drawn to the point that they find it difficult to say whether auditory images or motor images connected with the organs of articulation predominate. A good way of bringing the difficulty to consciousness is that proposed by Stricker: Partly open your mouth and then imagine any word with labials or dentals in it, such as 'bubble, 'toddle.' Is your image under these conditions distinct?

To most people the image is at first 'thick,' as the sound of the word would be if they tried to pronounce it with the lips parted. Many can never imagine the words clearly with the mouth open; others succeed after a few preliminary trials. The experiment proves how dependent our verbal imagination is on actual feelings in lips, tongue, throat, larynx, etc.

"When we recall the impression of a word or sentence, if we do not speak it out, we feel the twitter of the organs just about to come to that point. The articulating parts—the larynx, the tongue, the lips—are all sensibly excited; a *suppressed articulation is in fact the material of our recollection*, the intellectual manifestation, the *idea* of speech."^[69]

The open mouth in Stricker's experiment not only prevents actual articulation of the labials, but our feeling of its openness keeps us from imagining their articulation, just as a sensation of glaring light will keep us from strongly imagining darkness. In persons whose auditory imagination is weak, the articulatory image seems to constitute the whole material for verbal thought. Professor Stricker says that in his own case no auditory image enters into the words of which he thinks.^[70] Like most psychologists, however, he makes of his personal peculiarities a rule, and says that verbal thinking is normally and universally an exclusively motor representation. I certainly get auditory images, both of vowels and of consonants, in addition to the articulatory images or feelings on which this author lays such stress. And I find that numbers of my students, after repeating his experiments, come to this conclusion. There is *at first* a difficulty due to the open mouth. That, however, soon vanishes, as does also the difficulty of thinking of one vowel whilst continuously sounding another. What probably remains true, however, is that most men have a less auditory and a more articulatory verbal imagination than they are apt to be aware of. Professor Stricker himself has acoustic images, and can imagine the sounds of musical instruments, and the peculiar voice of a friend. A statistical inquiry on a large scale, into the variations of acoustic, tactile, and motor imagination, would probably bear less fruit than Galton's inquiry into visual images. A few monographs by competent observers, like Stricker, about their own peculiarities, would give much more valuable information about the diversities which prevail.^[71]

Touch-images are very strong in some people. The most vivid touch-images come when we ourselves barely escape local injury, or when we see another injured. The place may then actually tingle with the imaginary sensation—perhaps not altogether imaginary, since goose-flesh, paling or reddening, and other evidences of actual muscular contraction in the spot may result.

"An educated man," says a writer who must always be quoted when it is question of the powers of imagination,^[72] "told me once that on entering his house one day he received a shock from crushing the finger of one of his little children in the door. At the moment of his fright he felt a violent pain in the corresponding finger of his own body, and this pain abode with him three days."

The same author makes the following discrimination, which probably most men could verify:

"On the skin I easily succeed in bringing out suggested sensations wherever I will. But because it is necessary to protract the mental effort I can only awaken such sensations as are in their nature prolonged, as warmth, cold, pressure. Fleeting sensations, as those of a prick, a cut, a blow, etc., I am unable to call up, because I cannot imagine them *ex abrupto* with the requisite intensity. The sensations of the former order I can excite upon any part of the skin; and they may become so lively that, whether I will or not, I have to pass my hand over the place just as if it were a real impression on the skin."^[73]

Meyer's account of his own visual images is very interesting; and with it we may close our survey of differences between the normal powers of imagining in different individuals.

"With much practice," he says, "I have succeeded in making it possible for me to call up subjective visual sensations at will. I tried all my experiments by day or at night with closed eyes. At first it was very difficult. In the first experiments which succeeded the whole picture was luminous, the shadows being given in a somewhat less strong bluish light. In later experiments I saw the objects dark, with bright outlines, or rather I saw outline drawings of them, bright on a dark ground. I can compare these drawings less to chalk drawings on a

blackboard than to drawings made with phosphorus on a dark wall at night, though the phosphorus would show luminous vapors which were absent from my lines. If I wished, for example, to see a face, without intending that of a particular person, I saw the outline of a profile against the dark background. When I tried to repeat an experiment of the elder Darwin I saw only the edges of the die as bright lines on a dark ground. Sometimes, however, I saw the die really white and its edges black; it was then on a paler ground. I could soon at will change between a white die with black borders on a light field, and a black die with white borders on a dark field; and I can do this at any moment now. After long practice ... these experiments succeeded better still. I can now call before my eyes almost any object which I please, as a subjective appearance, and this in its own natural color and illumination. I see them almost always on a more or less light or dark, mostly dimly changeable ground. Even known faces I can see quite sharp, with the true color of hair and cheeks. It is odd that I see these faces mostly in profile, whereas those described [in the previous extract] were all full-face. Here are some of the final results of these experiments:

"1) Some time after the pictures have arisen they vanish or change into others, without my being able to prevent it.

"2) When the color does not integrally belong to the object, I cannot always control it. A face, e.g., never seems to me blue, but always in its natural color; a red cloth, on the other hand, I can sometimes change to a blue one.

"3) I have sometimes succeeded in seeing pure colors without objects; they then fill the entire field of view.

"4) I often fail to see objects which are not known to me, mere fictions of my fancy, and instead of them there will appear familiar objects of a similar sort; for instance, I once tried to see a brass sword-hilt with a brass guard, instead of which the more familiar picture of a rapier-guard appeared.

"5) Most of these subjective appearances, especially when they were bright, left after-images behind them when the eyes were quickly opened during their presence. For example, I thought of a silver

stirrup, and after I had looked at it a while I opened my eyes and for a long while afterwards saw its after-image.

"These experiments succeeded best when I lay quietly on my back and closed my eyes. I could bear no noise about me, as this kept the vision from attaining the requisite intensity. The experiments succeed with me now so easily that I am surprised they did not do so at first, and I feel as though they ought to succeed with everyone. The important point in them is to get the image sufficiently intense by the exclusive direction of the attention upon it, and by the removal of all disturbing impressions."^[74]

The negative after-images which succeeded upon Meyer's imagination when he opened his eyes are a highly interesting, though rare, phenomenon. So far as I know there is only one other published report of a similar experience.^[75] It would seem that in such a case the neural process corresponding to the imagination must be the entire tract concerned in the actual sensation, even down as far as the retina. This leads to a new question to which we may now turn—of what is

THE NEURAL PROCESS WHICH UNDERLIES IMAGINATION?

The commonly-received idea is that it is only a milder degree of the same process which took place when the thing now imagined was sensibly perceived. Professor Bain writes:

"Since a sensation in the first instance diffuses nerve-currents through the interior of the brain outwards to the organs of expression and movement,—the persistence of that sensation, after the outward exciting cause is withdrawn, can be but a continuance of the same diffusive currents, perhaps less intense, but not otherwise different. The shock remaining in the ear and brain, after the sound of thunder, must pass through the same circles, and operate in the same way as during the actual sound. We can have no reason for believing that, in this self-sustaining condition, the impression changes its seat, or passes into some new circles that have the special property of retaining it. Every part actuated *after* the shock must have been actuated *by* the

shock, only more powerfully. With this single difference of intensity, the mode of existence of a sensation existing after the fact is essentially the same as its mode of existence during the fact.... Now if this be the case with impressions *persisting* when the cause has ceased, what view are we to adopt concerning impressions *reproduced* by mental causes alone, or without the aid of the original, as in ordinary recollection? What is the manner of occupation of the brain with a resuscitated feeling of resistance, a smell or a sound? There is only one answer that seems admissible. *The renewed feeling occupies the very same parts, and in the same manner, as the original feeling, and no other parts, nor in any other assignable manner.* I imagine that if our present knowledge of the brain had been present to the earliest speculators, this is the only hypothesis that would have occurred to them. For where should a past feeling be embodied, if not in the same organs as the feeling when present? It is only in this way that its identity can be preserved; a feeling differently embodied would be a different feeling."^[76]

It is not plain from Professor Bain's text whether by the 'same parts' he means only the same parts *inside the brain*, or the same *peripheral* parts also, as those occupied by the original feeling. The examples which he himself proceeds to give are almost all cases of imagination of *movement*, in which the peripheral organs are indeed affected, for actual movements of a weak sort are found to accompany the idea. This is what we should expect. All currents tend to run forward in the brain and discharge into the muscular system; and the idea of a movement tends to do this with peculiar facility. But the question remains: Do currents run *backward*, so that if the optical centres (for example) are excited by 'association' and a visual object is imagined, a current runs *down to the retina* also, and excites that sympathetically with the higher tracts? In other words, *can peripheral sense-organs be excited from above, or only from without? Are they excited in imagination?* Professor Bain's instances are almost silent as to this point. All he says is this:

"We might think of a blow on the hand until the skin were actually irritated and inflamed. The attention very much directed to any part of the body, as the great toe, for instance, is apt to produce a distinct

feeling in the part, which we account for only by supposing a revived nerve-current to flow there, making a sort of false sensation, an influence from within mimicking the influences from without in sensation proper.—(See the writings of Mr. Braid, of Manchester, on Hypnotism, etc.)"

If I may judge from my own experience, all feelings of this sort are consecutive upon motor currents invading the skin and producing contraction of the muscles there, the muscles whose contraction gives 'goose-flesh' when it takes place on an extensive scale. I never get a *feeling* in the skin, however strongly I *imagine* it, until some actual change in the condition of the skin itself has occurred. The truth seems to be that the cases where peripheral sense-organs are directly excited in consequence of imagination are exceptional rarities, if they exist at all. *In common cases of imagination it would seem more natural to suppose that the seat of the process is purely cerebral, and that the sense-organ is left out.* Reasons for such a conclusion would be briefly these:

- 1) In imagination the *starting-point* of the process must be in the brain. Now we know that currents usually flow one way in the nervous system; and for the peripheral sense-organs to be excited in these cases, the current would have to flow backward.
- 2) There is between imagined objects and felt objects a difference of conscious quality which may be called almost absolute. It is hardly possible to confound the liveliest image of fancy with the weakest real sensation. The felt object has a plastic reality and outwardness which the imagined object wholly lacks. Moreover, as Fechner says, in imagination the attention feels as if drawn backwards to the brain; in sensation (even of after-images) it is directed forward towards the sense-organ.^[77] The difference between the two processes feels like one of kind, and not like a mere 'more' or 'less' of the same.^[78] If a sensation of sound were only a strong imagination, and an imagination a weak sensation, there ought to be a border-line of experience where we never could tell whether we were hearing a weak sound or imagining a strong one. In comparing a present sensation felt with a past one imagined, it will be remembered that we often judge the imagined one to *have been the stronger* (see above, Vol. I p. 500, note).

This is inexplicable if the imagination be simply a weaker excitement of the sensational process.

To these reasons the following objections may be made:

To 1): The current demonstrably *does* flow backward down the optic nerve in Meyer's and Féré's negative after-image. Therefore it *can* flow backward; therefore it *may* flow backward in some, however slight, degree, in all imagination.^[79]

To 2): The difference alleged is not absolute, and sensation and imagination *are* hard to discriminate where the sensation is so weak as to be just perceptible. At night hearing a very faint striking of the hour by a far-off clock, our imagination reproduces both rhythm and sound, and it is often difficult to tell which was the last real stroke. So of a baby crying in a distant part of the house, we are uncertain whether we still hear it, or only imagine the sound. Certain violin-players take advantage of this in diminuendo terminations. After the pianissimo has been reached they continue to bow as if still playing, but are careful not to touch the strings. The listener hears in imagination a degree of sound fainter still than the preceding pianissimo. This phenomenon is not confined to hearing:

"If we slowly approach our finger to a surface of water, we often deceive ourselves about the moment in which the wetting occurs. The apprehensive patient believes himself to feel the knife of the surgeon whilst it is still at some distance."^[80]

Visual perception supplies numberless instances in which the same sensation of vision is perceived as one object or another according to the interpretation of the mind. Many of these instances will come before us in the course of the next two chapters; and in [Chapter XIX](#) similar illusions will be described in the other senses. Taken together, all these facts would force us to admit that *the subjective difference between imagined and felt objects is less absolute than has been claimed, and that the cortical processes which underlie imagination and sensation are not quite as discrete as one at first is tempted to suppose. That peripheral sensory processes are ordinarily involved in imagination seems improbable; that they may sometimes be aroused from the cortex downwards cannot, however, be dogmatically denied.*

The imagination-process CAN then pass over into the sensation-process. In other words, genuine sensations *can* be centrally originated. When we come to study hallucinations in the chapter on Outer Perception, we shall see that this is by no means a thing of rare occurrence. At present, however, we must admit that *normally the two processes do NOT pass over into each other*; and we must inquire why. One of two things must be the reason. Either

1. Sensation-processes occupy a different *locality* from imagination-processes; or
2. Occupying the same locality, they have an *intensity* which under normal circumstances currents from other cortical regions are incapable of arousing, and to produce which currents from the periphery are required.

It seems almost certain (after what was said in Chapter II. pp. 49-51) *that the imagination-process differs from the sensation-process by its intensity rather than by its locality.* However it may be with lower animals, the assumption that ideational and sensorial centres are locally distinct appears to be supported by no facts drawn from the observation of human beings. After occipital destruction, the hemianopsia which results in man is sensorial blindness, not mere loss of optical ideas. Were there centres for crude optical sensation below the cortex, the patients in these cases would still feel light and darkness. Since they do not preserve even this impression on the lost half of the field, we must suppose that there are no centres for vision of any sort whatever below the cortex, and that the corpora quadrigemina and other lower optical ganglia are organs for reflex movement of eye-muscles and not for conscious sight. Moreover there are no facts which oblige us to think that, within the occipital cortex, one part is connected with sensation and another with mere ideation or imagination. The pathological cases assumed to prove this are all better explained by disturbances of conduction between the optical and other centres (see [p. 50](#)). In bad cases of hemianopsia the patient's images depart from him together with his sensibility to light. They depart so completely that he does not even know what is the matter with him. To perceive that one is blind to the right half of the field of view one must have an idea of that part of the field's possible existence. But the defect in these patients has to be revealed

to them by the doctor, they themselves only knowing that there is 'something wrong' with their eyes. What you have no idea of you cannot miss; and their not definitely missing this great region out of their sight seems due to the fact that their very idea and memory of it is lost along with the sensation. A man blind of his eyes merely, sees *darkness*. A man blind of his visual brain-centres can no more see darkness out of the parts of his retina which are connected with the brain-lesion than he can see it out of the skin of his back. He cannot see at all in that part of the field; and he cannot think of the light which he ought to be feeling *there*, for the very notion of the existence of that particular 'there' is cut out of his mind.^[81]

Now if we admit that sensation and imagination are due to the activity of the same centres in the cortex, we can see a very good teleological reason why they should correspond to discrete kinds of process in these centres, and why the process which gives the sense that the object is really there ought normally to be arousable only by currents entering from the periphery and not by currents from the neighboring cortical parts. We can see, in short, why *the sensational process* OUGHT TO BE DISCONTINUOUS WITH ALL NORMAL IDEATIONAL PROCESSES, HOWEVER INTENSE. For, as Dr. Münsterberg justly observes:

"Were there not this peculiar arrangement we should not distinguish reality and fantasy, our conduct would not be accommodated to the facts about us, but would be inappropriate and senseless, and we could not keep ourselves alive.... That our thoughts and memories should be copies of sensations with their intensity greatly reduced is thus a consequence deducible logically from the natural adaptation of the cerebral mechanism to its environment."^[82]

Mechanically the discontinuity between the ideational and the sensational kinds of process must mean that when the greatest ideational intensity has been reached, an order of *resistance* presents itself which only a new order of force can break through. The current from the periphery is the new order of force required; and what happens after the resistance is overcome is the sensational process. We may suppose that the latter consists in some new and more violent sort of disintegration of the neural matter, which now explodes at a deeper level than at other times.

Now how shall we conceive of the 'resistance' which prevents this sort of disintegration from taking place, this sort of intensity in the process from being attained, so much of the time? It must be either an intrinsic resistance, some force of cohesion in the neural molecules themselves; or an extrinsic influence, due to other cortical cells. When we come to study the process of hallucination we shall see that both factors must be taken into account. There is a degree of inward molecular cohesion in our brain-cells which it probably takes a sudden inrush of destructive energy to spring apart. Incoming peripheral currents possess this energy from the outset. Currents from neighboring cortical regions might attain to it if they could *accumulate* within the centre which we are supposed to be considering. But since during waking hours every centre communicates with others by association-paths, no such accumulation can take place. The cortical currents which run in run right out again, awakening the next ideas; the level of tension in the cells does not rise to the higher explosion-point; and the latter must be gained by a sudden current from the periphery or not at all.

[49] Prof. Jastrow has ascertained by statistical inquiry among the blind that if their blindness have occurred before a period embraced between the fifth and seventh years the visual centres seem to decay, and visual dreams and images are gradually outgrown. If sight is lost after the seventh year, visual imagination seems to survive through life. See Prof. J.'s interesting article on the Dreams of the Blind, in the New Princeton Review for January 1888.

[50] Impression means sensation for Hume.

[51] Treatise on Human Nature, part i. § vii.

[52] Huxley's Hume, pp. 92-94.

[53] On Intelligence (N. Y.), vol. ii. p. 139.

[54] Principles, Introd. § 13. Compare also the passage quoted above, vol. I, p. 469.

[55] The differences noted by Fechner between after-images and images of imagination proper are as follows:

After Images.

Feel coercive;

Seem unsubstantial, vaporous;

Imagination-images.

Feel subject to our spontaneity;

Have, as it were, more body;

Are sharp in outline;

Are blurred;

Are bright;

Are darker than even the darkest black of the after-images;

Are almost colorless;

Have lively coloration;

Are continuously enduring;

Incessantly disappear, and have to be renewed by an effort of will. At last even this fails to revive them.

Cannot be voluntarily changed.

Can be exchanged at will for others.

Are exact copies of originals.

Cannot violate the necessary laws of appearance of their originals—e.g., a man cannot be imagined from in front and behind at once. The imagination must walk round him, so to speak;

Are more easily got with shut than with open eyes;

Are more easily had with open than with shut eyes;

Seem to move when the head or eyes move;

Need not follow movements of head or eyes.

The field within which they appear (with closed eyes) is dark, contracted,

The field is extensive in three dimensions, and objects can be

flat, close to the eyes, in front, and the images have no perspective;

imagined in it above or behind almost as easily as in front.

The attention seems directed forwards towards the sense-organ, in observing after-images.

In imagining, the attention feels as if drawn backwards towards the brain.

Finally, Fechner speaks of the impossibility of attending to both after-images and imagination-images at once, even when they are of the same object and might be expected to combine. All these differences are true of Fechner; but many of them would be untrue of other persons. I quote them as a type of observation which any reader with sufficient patience may repeat. To them may be added, as a universal proposition, that after-images seem larger if we project them on a distant screen, and smaller if we project them on a near one, whilst no such change takes place in mental pictures.

[56] [I am myself a good draughtsman, and have a very lively interest in pictures, statues, architecture and decoration, and a keen sensibility to artistic effects. But I am an extremely poor visualizer, and find myself often unable to reproduce in my mind's eye pictures which I have most carefully examined.—W. J.]

[57] See also McCosh and Osborne, Princeton Review, Jan. 1884. There are some good examples of high development of the Faculty in the London Spectator, Dec. 28, 1878, pp. 1631, 1634, Jan. 4, 11, 25, and March 18, 1879.

[58] Take the following report from one of my students: "I am unable to form in my mind's eye any visual likeness of the table whatever. After many trials, I can only get a hazy surface, with nothing on it or about it. I can see no variety in color, and no positive limitations in extent, while I cannot see what I see well enough to determine its position in respect to my eye, or to endow it with any quality of size. I am in the same position as to the word *dog*. I cannot see it in my mind's eye at all; and so cannot tell whether I should have to run my eye along it, if I did see it."

[59] Progrès Médical, 21 juillet. I abridge from the German report of the case in Wilbrand: Die Seelenblindheit (188).

[60] In a letter to Charcot this interesting patient adds that his character also is changed: "I was formerly receptive, easily made enthusiastic, and possessed a rich fancy. Now I am quiet and cold, and fancy never carries my thoughts away.... I am much less susceptible than formerly to anger or sorrow. I lately lost my dearly-beloved mother; but felt far less grief at the bereavement than if I had been able to see in my mind's eye her physiognomy and the phases of her suffering, and especially less than if I had been able to witness in imagination the outward effects of her untimely loss upon the members of the family."

[61] Psychologie du Raisonnement (1886), p. 25.

[62] [I am myself a very poor visualizer, and find that I can seldom call to mind even a single letter of the alphabet in purely retinal terms. I must trace the letter by running my mental eye over its contour in order that the image of it shall have any distinctness at all. On questioning a large number of other people, mostly students, I find that perhaps half of them say they have no such difficulty in seeing letters mentally. Many affirm that they can see an entire word at once, especially a short one

like 'dog,' with no such feeling of creating the letters successively by tracing them with the eye.—W. J.]

[63] It is hardly needful to say that in modern primary education, in which the blackboard is so much used, the children are taught their letters, etc., by all possible channels at once, sight, hearing, and movement.

[64] See an interesting case of a similar sort, reported by Farges, in *l'Encéphale*, 7me Année, p. 545.

[65] *Philosophical Transactions*, 1841, p. 65.

[66] *Studien über die Sprachvorstellungen* (1880), and *Studien über die Bewegungsvorstellungen* (1882).

[67] Prof. Stricker admits that by practice he has succeeded in making his eye-movements 'act vicariously' for his leg-movements in imagining men walking.

[68] *Bewegungsvorstellungen*, p. 6.

[69] Bain: *Senses and Intellect*, p. 339.

[70] *Studien über Sprachvorstellungen*, 28, 31, etc. Cf. pp. 49-50, etc. Against Stricker, see Stumpf, *Tonpsychol.*, 155-162, and *Revue Philosophique*, xx. 617. See also Paulhan, *Rev. Philosophique*, xvi. 405. Stricker replies to Paulhan in vol. xviii. p. 685. P. retorts in vol. xix p. 118. Stricker reports that out of 100 persons questioned he found only *one* who had *no* feeling in his lips when silently thinking the letters M, B, P; and out of 60 only *two* who were conscious of no internal articulation whilst reading (pp. 59-60).

[71] I think it must be admitted that some people have no vivid substantive images in *any* department of their sensibility. One of my students, an intelligent youth, denied so pertinaciously that there was *anything* in his mind *at all* when he thought, that I was much perplexed by his case. I myself certainly have no such vivid play of nascent movements or motor images as Professor Stricker describes. When I seek to represent a row of soldiers marching, all I catch is a view of stationary legs first in one phase of movement and then in another, and these views are extremely imperfect and momentary. Occasionally (especially when I try to stimulate my imagination, as by repeating Victor Hugo's lines about the regiment,

"Leur pas est si correct, sans tarder ni courir,
Qu'on croit voir des ciseaux se fermer et s'ouvrir,")

I seem to get an instantaneous glimpse of an actual movement, but it is to the last degree dim and uncertain. All these images seem at first as if purely retinal. I think, however, that rapid eye-movements accompany them, though these latter give rise to such slight feelings that they are almost impossible of detection. Absolutely no leg-movements of my own are there; in fact, to call such up arrests my imagination of the soldiers. My optical images are in general very dim, dark, fugitive, and contracted. It would be utterly impossible to *draw* from them, and yet I perfectly well distinguish one from the other. My auditory images are excessively inadequate reproductions of their originals. I have *no* images of taste or smell. Touch-imagination is fairly distinct, but comes very little into play with most objects thought of. Neither is all my thought verbalized; for I have shadowy schemes of relation, as apt to terminate in a nod of the head or an expulsion of the breath as in a definite word. On the whole, vague images or sensations of movement inside of my head towards the various parts of space in which the terms I am thinking of either lie or are momentarily symbolized to lie together with movements of the breath through my pharynx and nostrils, form a by no means inconsiderable part of my *thought-stuff*. I doubt whether my difficulty in giving a clearer account is wholly a matter of inferior power of introspective attention, though that doubtless plays its part. Attention, *ceteris*

paribus, must always be inferior in proportion to the feebleness of the internal images which are offered it to hold on to.

[72] Geo. Herm. Meyer, *Untersuchungen üb. d. Physiol. d. Nervenfaser* (1843), p. 233. For other cases see Tuke's *Influence of Mind upon Body*, chaps. ii. and vii.

[73] Meyer, *op. cit.* p. 238.

[74] Meyer, *op. cit.* pp. 238-41.

[75] That of Dr. Ch. Féré in the *Revue Philosophique*, xx. 364. Johannes Müller's account of hypnagogic hallucinations floating before the eyes for a few moments after these had been opened, seems to belong more to the category of spontaneous hallucinations (see his *Physiology*, London, 1843, p. 1394). It is impossible to tell whether the words in Wundt's *Vorlesungen*, i. 387, refer to a personal experience of his own or not; probably not. *Il va sans dire* that an inferior visualizer like myself can get no such after-images. Nor have I as yet succeeded in getting report of any from my students.

[76] *Senses and Intellect*, p. 338.

[77] See above, [note 55](#).

[78] V. Kandinsky (*Kritische u. klinische Betrachtungen im Gebiete der Sinnestäuschungen* (Berlin, 1885), p. 135 ff.) insists that in even the liveliest pseudo-hallucinations (see below, [Chapter XX](#)), which may be regarded as the intensest possible results of the imaginative process, there is no outward objectivity perceived in the thing represented, and that a *ganzer Abgrund* separates these 'ideas' from true hallucination and objective perception.

[79] It seems to also flow backwards in certain hypnotic hallucinations. Suggest to a 'Subject' in the hypnotic trance that a sheet of paper has a red cross upon it, then pretend to remove the imaginary cross, whilst you tell the Subject to look fixedly at a dot upon the paper, and he will presently tell you that he sees a 'bluish-green' cross. The genuineness of the result has been doubted, but there seems no good reason for rejecting M. Binet's account (*Le Magnetisme Animal*, 1887, p. 188). M. Binet, following M. Parinaud, and on the faith of a certain experiment, at one time believed, the optical brain-centres and not the retina to be the seat of ordinary negative after-images. The experiment is this: Look fixedly, with one eye open, at a colored spot on a white background. Then close that eye and look fixedly with the *other* eye at a plain surface. A negative after-image of the colored spot will presently appear. (*Psychologie du Raisonnement*, 1886, p. 45.) But Mr. Delabarre has proved (*American Journal of Psychology*, ii. 326) that this after-image is due, not to a higher cerebral process, but to the fact that the retinal process in the *closed* eye affects consciousness at certain moments, and that its object is then projected into the field seen by the eye which is open. M. Binet informs me that he is converted by the proofs given by Mr. Delabarre.

The fact remains, however, that the negative after-images of Herr Meyer, M. Féré, and the hypnotic subjects, form an exception to all that we know of nerve-currents, if they are due to a refluent centrifugal current to the retina. It may be that they will hereafter be explained in some other way. Meanwhile we can only write them down as a paradox. Sig. Sergi's theory that there is *always* a refluent wave in perception hardly merits serious consideration (*Psychologie Physiologique*, pp. 99, 189). Sergi's theory has recently been reaffirmed with almost incredible crudity by Lombroso and Ottolenghi in the *Revue Philosophique*, xxix. 70 (Jan. 1890).

[80] Lotze, *Med. Psych.* p. 509.

[81] See an important article by Binet in the *Revue Philosophique*, xxvi. 481 (1888); also Dufour, in *Revue Méd. de la Suisse Romande*, 1889. No. 8, cited in the *Neurologisches Centralblatt*, 1890. p. 48.

[82] *Die Willenshandlung* (1888), pp. 129-40.

CHAPTER XIX.

THE PERCEPTION OF 'THINGS.'

PERCEPTION AND SENSATION COMPARED.

A pure sensation we saw above, [p. 7](#), to be an abstraction never realized in adult life. Any quality of a thing which affects our sense-organs does also more than that: it arouses processes in the hemispheres which are due to the organization of that organ by past experiences, and the result of which in consciousness are commonly described as ideas which the sensation suggests. The first of these ideas is that of the *thing* to which the sensible

quality belongs. *The consciousness of particular material things present to sense* is nowadays called *perception*.^[83] The consciousness of such things may be more or less complete; it may be of the mere name of the thing and its other essential attributes, or it may be of the thing's various remoter relations. It is impossible to draw any sharp line of distinction between the barer and the richer consciousness, because the moment we get beyond the first crude sensation all our consciousness is a matter of suggestion, and the various suggestions shade gradually into each other, being one and all products of the same psychological machinery of association. In the directer consciousness fewer, in the remoter more, associative processes are brought into play.

Perception thus differs from sensation by the consciousness of farther facts associated with the object of the sensation:

"When I lift my eyes from the paper on which I am writing I see the chairs and tables and walls of my room, each of its proper shape and at its proper distance. I see, from my window, trees and meadows, and horses and oxen, and distant hills. I see each of its proper size, of its proper form, and at its proper distance; and these particulars appear as immediate informations of the eye, as the colors which I see by means of it. Yet philosophy has ascertained that we derive nothing from the eye whatever but sensations of color.... How, then, is it that we receive accurate information, by the eye, of size and shape and distance? By association merely. The colors upon a body are different, according to its figure, its shape, and its size. But the sensations of color and what we may here, for brevity, call the sensations of extension, of figure, of distance, have been so often united, felt in conjunction, that the sensation of the color is never experienced without raising the ideas of the extension, the figure, the distance, in such intimate union with it, that they not only cannot be separated, but are actually supposed to be seen. The sight, as it is called, of figure, or distance, appearing as it does a simple sensation, is in reality a complex state of consciousness—a sequence in which the antecedent, a sensation of color, and the consequent, a number of ideas, are so closely combined by association that they appear not one idea, but one sensation."

This passage from James Mill^[84] gives a clear statement of the doctrine which Berkeley in his Theory of Vision made for the first time an integral part of Psychology. Berkeley compared our visual sensations to the words of a language, which are but signs or occasions for our intellects to pass to what the speaker means. As the sounds called words have no inward affinity with the ideas they signify, so neither have our visual sensations, according to Berkeley, any inward affinity with the things of whose presence they make us aware. Those things are *tangibles*; their real properties, such as shape, size, mass, consistency, position, reveal themselves only to touch. But the visible signs and the tangible significates are by long custom so "closely twisted, blended, and incorporated together, and the prejudice is so confirmed and riveted in our thoughts by a long tract of time, by the use of language, and want of reflection,"^[85] that we think we *see* the whole object, tangible and visible alike, in one simple indivisible act.

Sensational and reproductive brain-processes combined, then, are what give us the content of our perceptions. Every concrete particular material thing is a conflux of sensible qualities, with which we have become acquainted at various times. Some of these qualities, since they are more constant, interesting, or practically important, we regard as essential constituents of the thing. In a general way, such are the tangible shape, size, mass, etc. Other properties, being more fluctuating, we regard as more or less accidental or inessential. We call the former qualities the reality, the latter its appearances. Thus, I hear a sound, and say 'a horse-car'; but the sound is not the horse-car, it is one of the horse-car's least important manifestations. The real horse-car is a feelable, or at most a feelable and visible, thing which in my imagination the sound calls up. So when I get, as now, a brown eye-picture with lines not parallel, and with angles unlike, and call it my big solid rectangular walnut library-table, that picture is not the table. It is not even like the table as the table is for vision, when rightly seen. It is a distorted perspective view of three of the sides of what I mentally *perceive* (more or less) in its totality and undistorted shape. The back of the table, its square corners, its size, its heaviness, are features of which I am conscious when I look, almost as I am conscious of its name. The suggestion of the name is of course due to mere custom. But no less is that of the back, the size, weight, squareness, etc.

Nature, as Reid says, is frugal in her operations, and will not be at the expense of a particular instinct to give us that knowledge which experience and habit will soon produce. Reproduced sights and contacts tied together with the present sensation in the unity of a *thing* with a name, these are the complex objective stuff out of which my actually perceived table is made. Infants must go through a long education of the eye and ear before they can perceive the realities which adults perceive. *Every perception is an acquired perception.*^[86]

Perception may then be defined, in Mr. Sully's words, as that process by which the mind

"supplements a sense-impression by an accompaniment or escort of revived sensations, the whole aggregate of actual and revived sensations being solidified or 'integrated' into the form of a percept, that is, an apparently immediate apprehension or cognition of an object now present in a particular locality or region of space."^[87]

Every reader's mind will supply abundant examples of the process here described; and to write them down would be therefore both unnecessary and tedious. In the chapter on Space we have already discussed some of the more interesting ones; for in our perceptions of shape and position it is really difficult to decide how much of our sense of the object is due to reproductions of past experience, and how much to the immediate sensations of the eye. I shall accordingly confine myself in the rest of this chapter to certain additional generalities connected with the perceptive process.

The first point is relative to that 'solidification' or 'integration,' whereof Mr. Sully speaks, of the present with the absent and merely represented sensations. Cerebrally taken, these words mean no more than this, that the process aroused in the sense-organ has shot into various paths which habit has already organized in the hemispheres, and that instead of our having the sort of consciousness which would be correlated with the simple sensorial process, we have that which is correlated with this more complex process.

This, as it turns out, is the consciousness of that more complex 'object,' the whole 'thing,' instead of being the consciousness of that more simple object, the few qualities or attributes which actually impress our peripheral nerves. This consciousness must have the unity which every 'section' of our stream of thought retains so long as its objective content does not sensibly change. More than this we cannot say; we certainly ought not to say what usually is said by psychologists, and treat the perception as a sum of distinct psychic entities, the present sensation namely, *plus* a lot of images from the past, all 'integrated' together in a way impossible to describe. The perception is one state of mind or nothing—as I have already so often said.

In many cases it is easy to compare the psychic results of the sensational with those of the perceptive process. We then see a marked difference in the way in which the impressed portions of the object are felt, in consequence of being cognized along with the reproduced portion, in the higher state of mind. Their sensible quality changes under our very eye. Take the already-quoted catch, *Pas de lieu Rhône que nous*: one may read this over and over again without recognizing the sounds to be identical with those of the words *paddle your own canoe*. As we seize the English meaning the sound itself appears to change. Verbal sounds are usually perceived with their meaning at the moment of being heard. Sometimes, however, the associative irradiations are inhibited for a few moments (the mind being preoccupied with other thoughts) whilst the words linger on the ear as mere echoes of acoustic sensation. Then, usually, their interpretation suddenly occurs. But at that moment one may often surprise a change in the very *feel* of the word. Our own language would sound very different to us if we heard it without understanding, as we hear a foreign tongue. Rises and falls of voice, odd sibilants and other consonants, would fall on our ear in a way of which we can now form no notion. Frenchmen say that English sounds to them like the *gazouillement des oiseaux*—an impression which it certainly makes on no native ear. Many of us English would describe the sound of Russian in similar terms. All of us are conscious of the strong inflections of voice and explosives and gutturals of German speech in a way in which no German can be conscious of them.

This is probably the reason why, if we look at an isolated printed word and repeat it long enough, it ends by assuming an entirely unnatural aspect. Let the reader try this with any word on this page. He will soon begin to wonder

if it can possibly be the word he has been using all his life with that meaning. It stares at him from the paper like a glass eye, with no speculation in it. Its body is indeed there, but its soul is fled. It is reduced, by this new way of attending to it, to its sensational nudity. We never before attended to it in this way, but habitually got it clad with its meaning the moment we caught sight of it, and rapidly passed from it to the other words of the phrase. We apprehended it, in short, with a cloud of associates, and thus perceiving it, we felt it quite otherwise than as we feel it now divested and alone.

Another well-known change is when we look at a landscape with our head upside down. Perception is to a certain extent baffled by this manoeuvre; gradations of distance and other space-determinations are made uncertain; the reproductive or associative processes, in short, decline; and, simultaneously with their diminution, the colors grow richer and more varied, and the contrasts of light and shade more marked. The same thing occurs when we turn a painting bottom upward. We lose much of its meaning, but, to compensate for the loss, we feel more freshly the value of the mere tints and shadings, and become aware of any lack of purely sensible harmony or balance which they may show.^[88] Just so, if we lie on the floor and look up at the mouth of a person talking behind us. His lower lip here takes the habitual place of the upper one upon our retina, and seems animated by the most extraordinary and unnatural mobility, a mobility which now strikes us because (the associative processes being disturbed by the unaccustomed point of view) we get it as a naked sensation and not as part of a familiar object perceived.

On a later page other instances will meet us. For the present these are enough to prove our point. Once more we find ourselves driven to admit that when qualities of an object impress our sense and we thereupon perceive the object, the sensation as such of those qualities does not still exist inside of the perception and form a constituent thereof. The sensation is one thing and the perception another, and neither can take place at the same time with the other, because their cerebral conditions are not the same. They may *resemble* each other, but in no respect are they identical states of mind.

PERCEPTION IS OF DEFINITE AND PROBABLE THINGS.

The chief cerebral conditions of perception are the paths of association irradiating from the sense-impression, which may have been already formed. If a certain sensation be strongly associated with the attributes of a certain thing, that thing is almost sure to be perceived when we get the sensation. Examples of such things would be familiar people, places, etc., which we recognize and name at a glance. But *where the sensation is associated with more than one reality*, so that either of two discrepant sets of residual properties may arise, the perception is doubtful and vacillating, and *the most that can then be said of it is that it will be of a PROBABLE thing*, of the thing which would most usually have given us that sensation.

In these ambiguous cases it is interesting to note that perception is rarely abortive; *some* perception takes place. The two discrepant sets of associates do not neutralize each other or mix and make a blur. What we more commonly get is first one object in its completeness, and then the other in its completeness. In other words, *all brain-processes are such as give rise to what we may call FIGURED consciousness*. If paths are irradiated at all, they are irradiated in consistent systems, and occasion thoughts of definite objects, not mere hodge-podges of elements. Even where the brain's functions are half thrown out of gear, as in aphasia or dropping asleep, this law of figured consciousness holds good. A person who suddenly gets sleepy whilst reading aloud will read wrong; but instead of emitting a mere broth of syllables, he will make such mistakes as to read 'supper-time' instead of 'sovereign,' 'overthrow' instead of 'opposite,' or indeed utter entirely imaginary phrases, composed of several definite words, instead of phrases of the book. So in aphasia: where the disease is mild the patient's mistakes consist in using entire wrong words instead of right ones. Only in the gravest lesions does he become quite inarticulate. These facts show how subtle is the associative link; how delicate yet how strong that connection among brain-paths which makes any number of them, once excited together, thereafter tend to vibrate as a systematic whole. A small group of elements, '*this*,' common to two systems, A and B, may touch off A or B according as accident decides the next step (see Fig. 47). If it happen that a single point leading from '*this*' to B is momentarily a little more pervious than any leading from '*this*' to A, then that little advantage will upset the equilibrium in favor of the entire system B. The currents will sweep first through that point and thence into all the paths of B, each increment of advance making A more and more impossible. The thoughts correlated with

A and B, in such a case, will have objects different, though similar. The similarity will, however, consist in some very limited feature if the 'this' be small.

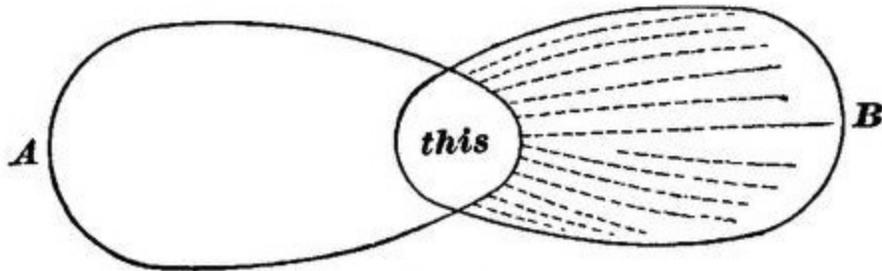


FIG. 47.

Thus the faintest sensations will give rise to the perception of definite things if only they resemble those which the things are wont to arouse. In fact, a sensation must be strong and distinct in order not to suggest an object and, if it is a nondescript feeling, really to seem one. The auræ of epilepsy, globes of light, fiery vision, roarings in the ears, the sensations which electric currents give rise to when passed through the head, these are unfigured because they are strong. Weaker feelings of the same sort would probably suggest objects. Many years ago, after reading Maury's book, *Le Sommeil et les Rêves*, I began for the first time to observe those ideas which faintly flit through the mind at all times, words, visions, etc., disconnected with the main stream of thought, but discernible to an attention on the watch for them. A horse's head, a coil of rope, an anchor, are, for example, ideas which have come to me unsolicited whilst I have been writing these latter lines. They can often be explained by subtle links of association, often not at all. But I have not a few times been surprised, after noting some such idea, to find, on shutting my eyes, an after-image left on the retina by some bright or dark object recently looked at, and which had evidently suggested the idea. 'Evidently,' I say, because the general shape, size, and position of object thought-of and of after-image were the same, although the idea had details which the retinal image lacked. We shall probably never know just what part retinal after-images play in determining the train of our thoughts. Judging by my own experiences I should suspect it of being not insignificant.^[89]

ILLUSIONS.

Let us now, for brevity's sake, treat A and B in Fig. 47 as if they stood for objects instead of brain-processes. And let us furthermore suppose that A and B are, both of them, objects which might probably excite the sensation which I have called '*this*,' but that on the present occasion A and not B is the one which actually does so. If, then, on this occasion '*this*' suggests A and not B, the result is a *correct perception*. But if, on the contrary, '*this*' suggests B and not A, the result is a *false perception*, or, as it is technically called, an *illusion*. But the *process* is the same, whether the perception be true or false.

Note that in every illusion what is false is what is inferred, not what is immediately given. The '*this*,' if it were felt by itself alone, would be all right, it only becomes misleading by what it suggests. If it is a sensation of sight, it may suggest a tactile object, for example, which later tactile experiences prove to be not there. *The so-called 'fallacy of the senses,' of which the ancient sceptics made so much account, is not fallacy of the senses proper, but rather of the intellect, which interprets wrongly what the senses give.*^[90]

So much premised, let us look a little closer at these illusions. They are due to two main causes. *The wrong object is perceived either because*

1) *Although not on this occasion the real cause, it is yet the habitual, inveterate, or most probable cause of 'this;'* or because

2) *The mind is temporarily full of the thought of that object, and therefore 'this' is peculiarly prone to suggest it at this moment.*

I will give briefly a number of examples under each head. The first head is the more important, because it includes a number of constant illusions to which all men are subject, and which can only be dispelled by much experience.

Illusions of the First Type.



FIG. 48.

One of the oldest instances dates from Aristotle. Cross two fingers and roll a pea, pen-holder, or other small object between them. It will seem double. Professor Croom Robertson has given the clearest analysis of this illusion. He observes that if the object be brought into contact first with the forefinger and next with the second finger, the two contacts seem to come in at different points of space. The forefinger-touch seems higher, though the finger is really lower; the second-finger-touch seems lower, though the finger is really higher. "We perceive the contacts as double because we refer them to two distinct parts of space." The touched sides of the two fingers are normally not together in space, and customarily never do touch one thing; the one thing which now touches them, therefore, seems in two places, i.e. seems two things.^[91]

There is a whole batch of illusions which come from optical sensations interpreted by us in accordance with our usual rule, although they are now produced by an unusual object. The *stereoscope* is an example. The eyes see a picture apiece, and the two pictures are a little disparate, the one seen by the right eye being a view of the object taken from a point slightly to the right of that from which the left eye's picture is taken. Pictures thrown on the two eyes by solid objects present this identical disparity. Whence we react on the sensation in our usual way, and perceive a solid. If the pictures be exchanged we perceive a hollow mould of the object, for a hollow mould would cast just such disparate pictures as these. Wheatstone's instrument, the *pseudoscope*, allows us to look at solid objects and see with each eye the other eye's picture. We then perceive the solid object hollow, *if it be an object which might probably be hollow*, but not otherwise. A human face, e.g., never appears hollow to the pseudoscope. In this irregularity of reaction on different objects, some seem hollow, others not; the perceptive process is true to its law, which is *always to react on the sensation in a*

determinate and figured fashion if possible, and in as probable a fashion as the case admits. To couple faces and hollowness violates all our habits of association. For the same reason it is very easy to make an intaglio cast of a face, or the painted inside of a pasteboard mask, look convex, instead of concave as they are.

Our sense of the *position* of things with respect to our eye consists in suggestions of how we must move our hand to touch them. Certain places of the image on the retina, certain actively-produced positions of the eyeballs, are normally linked with the sense of every determinate position which an outer thing may come to occupy. Hence we perceive the usual position, even if the optical sensation be artificially brought from a different part of space. Prisms warp the light-rays in this way, and throw upon the retina the image of an object situated, say, at spot *a* of space in the same manner in which (without the prisms) an object situated at spot *b* would cast its image. Accordingly we feel for the object at *b* instead of *a*. If the prism be before one eye only we see the object at *b* with that eye, and in its right position *a* with the other—in other words, we see it double. If both eyes be armed with prisms with their angle towards the right, we pass our hand to the right of all objects when we try rapidly to touch them. And this illusory sense of their position lasts until a new association is fixed, when on removing the prisms a contrary illusion at first occurs. Passive or unintentional changes in the position of the eyeballs seem to be no more kept account of by the mind than prisms are; so we spontaneously make no allowance for them in our perception of distance and movements. Press one of the eyeballs into a strained position with the finger, and objects move and are translocated accordingly, just as when prisms are used.

Curious *illusions of movement* in objects occur whenever the eyeballs move without our intending it. We shall learn in the following chapter that the original visual feeling of movement is produced by any image passing over the retina. Originally, however, this sensation is definitely referred neither to the object nor to the eyes. Such definite reference grows up later, and obeys certain simple laws. We believe objects to move: 1) whenever we get the retinal movement-feeling, but think our eyes are still; and 2) whenever we think that our eyes move, but fail to get the retinal movement-feeling. We believe objects to be still, on the contrary, 1) whenever we get the retinal movement-feeling, but think our eyes are moving; and 2) whenever

we neither think our eyes are moving, nor get the retinal movement-feeling. Thus the perception of the object's state of motion or rest depends on the notion we frame of our own eye's movement. Now many sorts of stimulation make our eyes move without our knowing it. If we look at a waterfall, river, railroad train, or any body which continuously passes in front of us in the same direction, it carries our eyes with it. This movement can be noticed in our eyes by a bystander. If the object keep passing towards our left, our eyes keep following whatever moving bit of it may have caught their attention at first, until that bit disappears from view. Then they jerk back to the right again, and catch a new bit, which again they follow to the left, and so on indefinitely. This gives them an oscillating demeanor, slow involuntary rotations leftward alternating with rapid voluntary jerks rightward. But *the oscillations continue* for a while after the object has come to a standstill, or the eyes are carried to a new object, and this produces the illusion that things now move in the opposite direction. For we are unaware of the slow leftward automatic movements of our eyeballs, and think that the retinal movement-sensations thereby aroused must be due to a rightward motion of the object seen; whilst the rapid voluntary rightward movements of our eyeballs we interpret as attempts to pursue and catch again those parts of the object which have been slipping away to the left.

Exactly similar oscillations of the eyeballs are produced in *giddiness*, with exactly similar results. Giddiness is easiest produced by whirling on our heels. It is a feeling of the movement of our own head and body through space, and is now pretty well understood to be due to the irritation of the semi-circular canals of the inner ear.^[92] When, after whirling, we stop, we seem to be spinning in the reverse direction for a few seconds, and then objects appear to continue whirling in the same direction in which, a moment previous, our body actually whirled. The reason is that our *eyes normally tend to maintain* their field of view. If we suddenly turn our head leftwards it is hard to make the eyes follow. They roll in their orbits rightwards, by a sort of compensating inertia. Even though we *falsely think* our head to be moving leftwards, this consequence occurs, and our eyes move rightwards—as may be observed in any one with vertigo after whirling. As these movements are unconscious, the retinal movement-feelings which they occasion are naturally referred to the objects seen. And the intermittent voluntary twitches of the eyes towards the left, by which we

ever and anon recover them from the extreme rightward positions to which the reflex movement brings them, simply confirm and intensify our impression of a leftward-whirling field of view: we seem to ourselves to be periodically pursuing and overtaking the objects in their leftward flight. The whole phenomenon fades out after a few seconds. And it often ceases if we voluntarily fix our eyes upon a given point.^[93]

Optical vertigo, as these illusions of objective movement are called, results sometimes from brain-trouble, intoxications, paralysis, etc. A man will awaken with a weakness of one of his eye-muscles. An intended orbital rotation will then not produce its expected result in the way of retinal movement-feeling—whence false perceptions, of which one of the most interesting cases will fall to be discussed in later chapters.

There is an illusion of movement of the opposite sort, with which every one is familiar at *railway stations*. Habitually, when we ourselves move forward, our entire field of view glides backward over our retina. When our movement is due to that of the windowed carriage, car, or boat in which we sit, all stationary objects visible through the window give us a sensation of gliding in the opposite direction. Hence, whenever we get this sensation, of a window with *all* objects visible through it moving in one direction, we react upon it in our customary way, and perceive a stationary field of view, over which the window, and we ourselves inside of it, are passing by a motion of our own. Consequently when another train comes alongside of ours in a station, and fills the entire window, and, after standing still awhile, begins to glide away, we judge that it is *our* train which is moving, and that the other train is still. If, however, we catch a glimpse of any part of the station through the windows, or between the cars, of the other train, the illusion of our own movement instantly disappears, and we perceive the other train to be the one in motion. This, again, is but making the usual and probable inference from our sensation.^[94]

Another illusion due to movement is explained by Helmholtz. Most wayside objects, houses, trees, etc., look small when seen out of the windows of a swift train. This is because we perceive them in the first instance unduly

near. And we perceive them unduly near because of their extraordinarily rapid parallaxic flight backwards. When we ourselves move forward all objects glide backwards, as aforesaid; but the nearer they are, the more rapid is this apparent translocation. Relative rapidity of passage backwards is thus so familiarly associated with nearness that when we feel it we perceive nearness. But with a given size of retinal image the nearer an object is, the smaller do we judge its actual size to be. Hence in the train, the faster we go, the nearer do the trees and houses seem, and the nearer they seem, the smaller do they look.^[95]

Other illusions are due to the feeling of convergence being wrongly interpreted. When we converge our eyeballs we perceive an *approximation* of whatever thing we may be looking at. Whatever things do approach whilst we look at them oblige us, so long as they are not very distant, to converge our eyes. Hence approach of the thing is the *probable* objective fact when we feel our eyes converging. Now in most persons the internal recti muscles, to which convergence is due, are weaker than the others; and the entirely passive position of the eyeballs, the position which they assume when covered and looking at nothing in particular, is either that of parallelism or of slight divergence. Make a person look with both eyes at some near object, and then screen the object from *one* of his eyes by a card or book. The chances are that you will see the eye thus screened turn just a little outwards. Remove the screen, and you will now see it turn in as it catches sight of the object again. The other eye meanwhile keeps as it was at first. To most persons, accordingly, all objects seem to *come nearer* when, after looking at them with one eye, both eyes are used; and they seem to *recede* during the opposite change. With persons whose external recti muscles are insufficient, the illusions may be of the contrary kind.

The size of the retinal image is a fruitful source of illusions. Normally, the retinal image grows larger as the object draws near. But the sensation yielded by this enlargement is also given by any object which really grows

in size without changing its distance. Enlargement of retinal image is therefore an ambiguous sign. An opera-glass enlarges the moon. But most persons will tell you that she looks smaller through it, only a great deal nearer and brighter. They read the enlargement as a sign of approach; and the perception of approach makes them actually reverse the sensation which suggests it—by an exaggeration of our habitual custom of making allowance of the apparent enlargement of whatever object approaches us, and reducing it in imagination to its natural size. Similarly, in the theatre the glass brings the stage near, but hardly seems to magnify the people on it.

The well-known increased *apparent size of the moon on the horizon* is a result of association and probability. It is seen through vaporous air, and looks dimmer and duskier than when it rides on high; and it is seen over fields, trees, hedges, streams, and the like, which break up the intervening space and make us the better realize the latter's extent. Both these causes make the moon seem more distant from us when it is low; and as its visual angle grows no less, we deem that it must be a larger body, and we so perceive it. It looks particularly enormous when it comes up directly behind some well-known large object, as a house or tree, distant enough to subtend an angle no larger than that of the moon itself.^[96]

The feeling of accommodation also gives rise to false perceptions of size. Usually we accommodate our eyes for an object as it approaches us. Usually under these circumstances the object throws a larger retinal image. But believing the object to remain the same, we make allowance for this and treat the entire eye-feeling which we receive as significant of nothing but *approach*. When we relax our accommodation and at the same time the retinal image grows smaller, the probable cause is always a *receding* object. The moment we put on convex glasses, however, the accommodation relaxes, but the retinal image grows larger instead of less. This is what would happen if our object, whilst receding, grew. Such a probable object we accordingly perceive, though with a certain vacillation as to the recession, for the growth in apparent size is also a probable sign of approach, and is at moments interpreted accordingly.—Atropin paralyzes the muscles of accommodation. It is possible to get a dose which will

weaken these muscles without laming them altogether. When a known near object is then looked at we have to make the same voluntary strain to accommodate, as if it were a great deal nearer; but as its retinal image is not enlarged in proportion to this suggested approach, we deem that it must have grown smaller than usual. In consequence of this so-called *micropsy*, Aubert relates that he saw a man apparently no larger than a photograph. But the small size again made the man seem farther off. The real distance was two or three feet, and he seemed against the wall of the room.^[97] Of these vacillations we shall have to speak again in the ensuing chapter.^[98]



FIG. 49.

Mrs. C. L. Franklin has recently described and explained with rare acuteness an illusion of which the most curious thing is that it was never noticed before. Take a single pair of crossed lines (Fig. 49), hold them in a horizontal plane before the eyes, and look along them, at such a distance that with the right eye shut, 1, and with the left eye shut, 2, looks like the projection of a vertical line. Look steadily now at the point of intersection of the lines with both eyes open, and you will see a third line sticking up like a pin through the paper at right angles to the plane of the two first lines. The explanation of this illusion is very simple, but so circumstantial that I must refer for it to Mrs. Franklin's own account.^[99] Suffice it that images of the two lines fall on 'corresponding' rows of retinal points, and that the illusory vertical line is the only object capable of throwing such images. A variation of the experiment is this:

"In Fig. 50 the lines are all drawn so as to pass through a common point. With a little trouble one eye can be put into the position of this point—it is only necessary that the paper be held so that, with one eye shut, the other eye sees all the lines leaning neither to the right nor to the left. After a moment one can fancy the lines to be vertical staffs standing out of the plane of the paper.'... This illusion [says Mrs. Franklin] I take to be of purely mental origin. When a line lies anywhere in a plane passing through the apparent vertical meridian of one eye, and is looked at with that eye only... we have no very good means of knowing how it is directed in that plane.... Now of the lines in nature which lie anywhere within such a plane, by far the greater number are vertical lines. Hence we are peculiarly inclined to think that a line which we perceive to be in such a plane is a vertical line. But to see a whole lot of lines at once, all ready to throw their images upon the vertical meridian, is a thing that has hardly ever happened to us, except when they all have been vertical lines. Hence when that happens we have a still stronger tendency to think that what we see before us is a group of vertical lines."

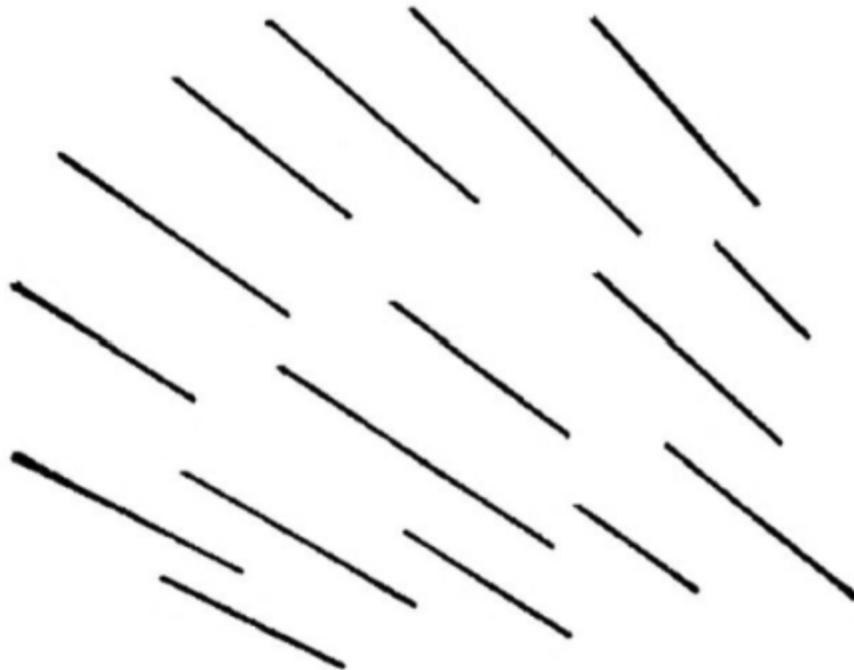


FIG. 50.

In other words, we see, as always, the most probable object.

The foregoing may serve as examples of the first type of illusions mentioned on [page 86](#). I could cite of course many others, but it would be tedious to enumerate all the thaumatropes and zoetropes, dioramas, and juggler's tricks in which they are embodied. In the chapter on Sensation we saw that many illusions commonly ranged under this type are, physiologically considered, of another sort altogether, and that associative processes, strictly so called, have nothing to do with their production.

Illusions of the Second Type.

We may now turn to illusions of the second of the two types discriminated on [page 86](#). In this type we perceive a wrong object because our mind is full of the thought of it at the time, and any sensation which is in the least degree connected with it touches off, as it were, a train already laid, and gives us a sense that the object is really before us. Here is a familiar example:

"If a sportsman, while shooting woodcock in cover, sees a bird about the size and color of a woodcock get up and fly through the foliage, not having time to see more than that it is a bird of such a size and color, he immediately supplies by inference the other qualities of a woodcock, and is afterwards disgusted to find that he has shot a thrush. I have done so myself, and could hardly believe that the thrush was the bird I had fired at, so complete was my mental supplement to my visual perception."^[100]

As with game, so with enemies, ghosts, and the like. Anyone waiting in a dark place and expecting or fearing strongly a certain object will interpret any abrupt sensation to mean that object's presence. The boy playing 'I spy,' the criminal skulking from his pursuers, the superstitious person hurrying through the woods or past the churchyard at midnight, the man lost in the woods, the girl who tremulously has made an evening appointment with her swain, all are subject to illusions of sight and sound which make their hearts beat till they are dispelled. Twenty times a day the lover, perambulating the

streets with his preoccupied fancy, will think he perceives his idol's bonnet before him.

The Proof-reader's Illusion. I remember one night in Boston, whilst waiting for a 'Mount Auburn' car to bring me to Cambridge, reading most distinctly that name upon the signboard of a car on which (as I afterwards learned) 'North Avenue' was painted. The illusion was so vivid that I could hardly believe my eyes had deceived me. All reading is more or less performed in this way.

"Practised novel- or newspaper-readers could not possibly get on so fast if they had to see accurately every single letter of every word in order to perceive the words. More than half of the words come out of their mind, and hardly half from the printed page. Were this not so, did we perceive each letter by itself, typographic errors in well-known words would never be overlooked. Children, whose ideas are not yet ready enough to perceive words at a glance, read them wrong if they are printed wrong, that is, right according to the way of printing. In a foreign language, although it may be printed with the same letters, we read by so much the more slowly as we do not understand, or are unable promptly to perceive the words. But we notice misprints all the more readily. For this reason Latin and Greek and, still better, Hebrew works are more correctly printed, because the proofs are better corrected, than in German works. Of two friends of mine, one knew much Hebrew, the other little; the latter, however, gave instruction in Hebrew in a gymnasium; and when he called the other to help correct his pupils' exercises, it turned out that he could find out all sorts of little errors better than his friend, because the latter's perception of the words as totals was too swift."^[101]

Testimony to personal identity is proverbially fallacious for similar reasons. A man has witnessed a rapid crime or accident, and carries away his mental image. Later he is confronted by a prisoner whom he forthwith perceives in the light of that image, and recognizes or 'identifies' as a participant, although he may never have been near the spot. Similarly at the so-called 'materializing séances' which fraudulent mediums give: in a dark room a man sees a gauze-robed figure who in a whisper tells him she is the spirit of his sister, mother, wife, or child, and falls upon his neck. The darkness, the

previous forms, and the expectancy have so filled his mind with premonitory images that it is no wonder he perceives what is suggested. These fraudulent 'séances' would furnish most precious documents to the psychology of perception, if they could only be satisfactorily inquired into. In the hypnotic trance any suggested object is sensibly perceived. In certain subjects this happens more or less completely after waking from the trance. It would seem that under favorable conditions a somewhat similar susceptibility to suggestion may exist in certain persons who are not otherwise entranced at all.

This suggestibility is greater in the lower senses than in the higher. A German observer writes:

"We know that a weak smell or taste may be very diversely interpreted by us, and that the same sensation will now be named as one thing and the next moment as another. Suppose an agreeable smell of flowers in a room: A visitor will notice it, seek to recognize what it is, and at last perceive more and more distinctly that it is the perfume of roses—until after all he discovers a bouquet of violets. Then suddenly he recognizes the violet-smell, and wonders how he could possibly have hit upon the roses.—Just so it is with taste. Try some meat whose visible characteristics are disguised by the mode of cooking, and you will perhaps begin by taking it for venison, and end by being quite certain that it is venison, until you are told that it is mutton; whereupon you get distinctly the mutton flavor.—In this wise one may make a person taste or smell what one will, if one only makes sure that he shall conceive it beforehand as we wish, by saying to him: 'Doesn't that taste just like, etc.?' or 'Doesn't it smell just like, etc.?' One can cheat whole companies in this way; announce, for instance, at a meal, that the meat tastes 'high,' and almost every one who is not animated by a spirit of opposition will discover a flavor of putrescence which in reality is not there at all.

"In the sense of *feeling* this phenomenon is less prominent, because we get so close to the object that our sensation of it is never incomplete. Still, examples may be adduced from this sense. On superficially feeling of a cloth, one may confidently declare it for velvet, whilst it is perhaps a long-haired cloth; or a person may perhaps not be able to

decide whether he has put on woolen or cotton stockings, and, trying to ascertain this by the feeling on the skin of the feet, he may become aware that he gets the feeling of cotton or wool according as he thinks of the one or the other. When the feeling in our fingers is somewhat blunted by cold, we notice many such phenomena, being then more exposed to confound objects of touch with one another."^[102]

High authorities have doubted this power of imagination to falsify present impressions of sense.^[103] Yet it unquestionably exists. Within the past fortnight I have been annoyed by a smell, faint but unpleasant, in my library. My annoyance began by an escape of gas from the furnace below stairs. This seemed to get lodged in my imagination as a sort of standard of perception; for, several days after the furnace had been rectified, I perceived the 'same smell' again. It was traced this time to a new pair of India rubber shoes which had been brought in from the shop and laid on a table. It persisted in coming to me for several days, however, in spite of the fact that no other member of the family or visitor noticed anything unpleasant. My impression during part of this time was one of uncertainty whether the smell was imaginary or real; and at last it faded out. Everyone must be able to give instances like this from the smell-sense. When we have paid the faithless plumber for pretending to mend our drains, the intellect inhibits the nose from perceiving the same unaltered odor, until perhaps several days go by. As regards the ventilation or heating of rooms, we are apt to feel for some time as we think we ought to feel. If we believe the ventilator is shut, we feel the room close. On discovering it open, the oppression disappears.

An extreme instance is given in the following extract:

"A patient called at my office one day in a state of great excitement from the effects of an offensive odor in the horse-car she had come in, and which she declared had probably emanated from some very sick person who must have been just carried in it. There could be no doubt that something had affected her seriously, for she was very pale, with nausea, difficulty in breathing, and other evidences of bodily and mental distress. I succeeded, after some difficulty and time, in quieting her, and she left, protesting that the smell was unlike anything she had ever before experienced and was something dreadful. Leaving my

office soon after, it so happened that I found her at the street-corner, waiting for a car: we thus entered the car together. She immediately called my attention to the same sickening odor which she had experienced in the other car, and began to be affected the same as before, when I pointed out to her that the smell was simply that which always emanates from the straw which has been in stables. She quickly recognized it as the same, when the unpleasant effects which arose while she was possessed with another perception of its character at once passed away."^[104]

It is the same with touch. Everyone must have felt the sensible quality change under his hand, as sudden contact with something moist or hairy, in the dark, awoke a shock of disgust or fear which faded into calm recognition of some familiar object? Even so small a thing as a crumb of potato on the table-cloth, which we pick up, thinking it a crumb of bread, feels horrible for a few moments to our fancy, and different from what it is.

Weight or muscular feeling is a sensation; yet who has not heard the anecdote of some one to whom Sir Humphry Davy showed the metal sodium which he had just discovered? "Bless me, how heavy it is!" said the man; showing that his idea of what metals as a class ought to be had falsified the sensation he derived from a very light substance.

In the sense of hearing, similar mistakes abound. I have already mentioned the hallucinatory effect of mental images of very faint sounds, such as distant clock-strokes (above, [p. 71](#)). But even when stronger sensations of sound have been present, everyone must recall some experience in which they have altered their acoustic character as soon as the intellect referred them to a different source. The other day a friend was sitting in my room, when the clock, which has a rich low chime, began to strike. "Hollo!" said he, "hear that hand-organ in the garden," and was surprised at finding the real source of the sound. I had myself some years ago a very striking illusion of the sort. Sitting reading late one night, I suddenly heard a most formidable noise proceeding from the upper part of the house, which it seemed to fill. It ceased, and in a moment renewed itself. I went into the hall to listen, but it came no more. Resuming my seat in the room, however, there it was again, low, mighty, alarming, like a rising flood or the *avant-courier* of an awful gale. It came from all space. Quite startled, I again went

into the hall, but it had already ceased once more. On returning a second time to the room, I discovered that it was nothing but the breathing of a little Scotch terrier which lay asleep on the floor. The noteworthy thing is that as soon as I recognized what it was, I was compelled to think it a different sound, and could not then *hear* it as I had heard it a moment before.

In the anecdotes given by Delbœuf and Reid, this was probably also the case, though it is not so stated. Reid says:

"I remember that once lying abed, and having been put into a fright, I heard my own heart beat; but I took it to be one knocking at the door, and arose and opened the door oftener than once, before I discovered that the sound was in my own breast." (Inquiry, chap. iv. § 1.)

Delbœuf's story is as follows:

"The illustrious P. J. van Beneden, senior, was walking one evening with a friend along a woody hill near Chaudfontaine. 'Don't you hear,' said the friend, 'the noise of a hunt on the mountain?' M. van Beneden listens and distinguishes in fact the giving-tongue of the dogs. They listen some time, expecting from one moment to another to see a deer bound by; but the voice of the dogs seems neither to recede nor approach. At last a countryman comes by, and they ask him who it is that can be hunting at this late hour. But he, pointing to some puddles of water near their feet, replies: 'Yonder little animals are what you hear.' And there there were in fact a number of toads of the species *Bombinator igneus*.... This batrachian emits at the pairing season a silvery or rather crystalline note.... Sad and pure, it is a voice in nowise resembling that of hounds giving chase."^[105]

The sense of sight, as we have seen in studying Space, is pregnant with illusions of both the types considered. No sense gives such fluctuating impressions of the same object as sight does. With no sense are we so apt to treat the sensations immediately given as mere signs; with none is the invocation from memory of a *thing*, and the consequent perception of the latter, so immediate. The 'thing' which we perceive always resembles, as we have seen, the object of some absent sensation, usually another optical

figure which in our mind has come to be the standard of reality; and it is this incessant reduction of our optical objects to more 'real' forms which has led some authors into the mistake of thinking that the sensations which first apprehend them are originally and natively of no form at all.^[106]

Of accidental and occasional illusions of sight many amusing examples might be given. Two will suffice. One is a reminiscence of my own. I was lying in my berth in a steamer listening to the sailors holystone the deck outside; when, on turning my eyes to the window, I perceived with perfect distinctness that the chief-engineer of the vessel had entered my state-room, and was standing looking through the window at the men at work upon the guards. Surprised at his intrusion, and also at his intentness and immobility, I remained watching him and wondering how long he would stand thus. At last I spoke; but getting no reply, sat up in my berth, and then saw that what I had taken for the engineer was my own cap and coat hanging on a peg beside the window. The illusion was complete; the engineer was a peculiar-looking man; and I saw him unmistakably; but after the illusion had vanished I found it hard voluntarily to make the cap and coat look like him at all.

The following story, which I owe to my friend Prof. Hyatt, is of a probably not uncommon class:

"During the winter of 1858, while in Venice, I had the somewhat peculiar illusion which you request me to relate. I remember the circumstances very accurately because I have often repeated the story, and have made an effort to keep all the attendant circumstances clear of exaggeration. I was travelling with my mother, and we had taken rooms at a hotel which had been located in an old palace. The room in which I went to bed was large and lofty. The moon was shining brightly, and I remember standing before a draped window, thinking of the romantic nature of the surroundings, remnants of old stories of knights and ladies, and the possibility that even in that room itself love-scenes and sanguinary tragedies might have taken place. The night was so lovely that many of the people were strolling through the narrow lanes or so-called streets, singing as they went, and I laid awake for some time listening to these patrols of serenaders, and of course finally fell asleep. I became aware that some one was leaning

over me closely, and that my own breathing was being interfered with; a decided feeling of an unwelcome presence of some sort awakened me. As I opened my eyes I saw, as distinctly as I ever saw any living person, a draped head about a foot or eighteen inches to the right, and just above my bed. The horror which took possession of my young fancy was beyond anything I have ever experienced. The head was covered by a long black veil which floated out into the moonlight, the face itself was pale and beautiful, and the lower part swathed in the white band commonly worn by the nuns of Catholic orders. My hair seemed to rise up, and a profuse perspiration attested the genuineness of the terror which I felt. For a time I lay in this way, and then gradually gaining more command over my superstitious terrors, concluded to try to grapple with the apparition. It remained perfectly distinct until I reached at it sharply with my hand, and then disappeared, to return again, however, as soon as I sank back into the pillow. The second or third grasp which I made at the head was not followed by a reappearance, and I then saw that the ghost was not a real presence, but depended upon the position of my head. If I moved my eyes either to the left or right of the original position occupied by my head when I awakened, the ghost disappeared, and by returning to about the same position, I could make it reappear with nearly the same intensity as at first. I presently satisfied myself by these experiments that the illusion arose from the effect of the imagination, aided by the actual figure made by a visual section of the moonbeams shining through the lace curtains of the window. If I had given way to the first terror of the situation and covered up my head, I should probably have believed in the reality of the apparition, since I have not by the slightest word, so far as I know, exaggerated the vividness of my feelings."

THE PHYSIOLOGICAL PROCESS IN PERCEPTION.

Enough, has now been said to prove the general law of perception, which is this, that *whilst part of what we perceive comes through our senses from the object before us, another part (and it may be the larger part) always comes (in Lazarus's phrase) out of our own head.*

At bottom this is only one case (and that the simplest case) of the general fact that our nerve-centres are an organ for reacting on sense-impressions, and that our hemispheres, in particular, are given us in order that records of our private past experience may co-operate in the reaction. Of course such a general way of stating the fact is vague; and all those who follow the current theory of ideas will be prompt to throw this vagueness at it as a reproach. Their way of describing the process goes much more into detail. The sensation, they say, awakens 'images' of other sensations associated with it in the past. These images 'fuse,' or are 'combined' by the Ego with the present sensation into a new product, the percept, etc., etc. Something so indistinguishable from this in practical outcome is what really occurs, that one may seem fastidious in objecting to such a statement, specially if have no rival theory of the elementary processes to propose. And yet, if this notion of images rising and flocking and fusing *be* mythological (and we have all along so considered it), why should we entertain it unless confessedly as a mere figure of speech? As such, of course, it is convenient and welcome to pass. But if we try to put an exact meaning into it, all we find is that the brain reacts by paths which previous experiences have worn, and makes us usually perceive the probable thing, i.e., the thing by which on previous occasions the reaction was most frequently aroused.

But we can, I think, without danger of being too speculative, be a little more exact than this, and conceive of a physiological reason why the felt quality of an object changes when, instead of being apprehended in a mere sensation, the object is perceived as a thing. All consciousness seems to depend on a certain slowness of the process in the cortical cells. The rapider currents are, the less feeling they seem to awaken. If a region A, then, be so connected with another region B that every current which enters A immediately drains off into B, we shall not be very strongly conscious of the sort of object that A can make us feel. If B, on the contrary, has no such copious channel of discharge, the excitement will linger there longer ere it diffuses itself elsewhere, and our consciousness of the sort of object that B makes us feel will be strong. Carrying this to an ideal maximum, we may say that if A offer *no* resistance to the transmission forward of the current, and if the current *terminate* in B, then, no matter what causes may initiate the current, we shall get no consciousness of the object peculiar to A, but on the contrary a vivid sensation of the object peculiar to B. And this will be true though at other times the connection between A and B might lie less

open, and every current *then* entering A might give us a strong consciousness of A's peculiar object. In other words, just in proportion as associations are habitual, will the qualities of the suggested thing tend to substitute themselves in consciousness for those of the thing immediately there; or, more briefly, *just in proportion as an experience is probable will it tend to be directly felt*. In all such experiences the paths lie wide open from the cells first affected to those concerned with the suggested ideas. A circular after-image on the receding wall or ceiling is actually *seen* as an ellipse, a square after-image of a cross there is seen as slant-legged, etc., because only in the process correlated with the vision of the latter figures do the inward currents find a pause (see the next chapter).

We must remember this when, in dealing with the eye, we come to point out the erroneousness of the principle laid down by Reid and Helmholtz that true sensations can never be changed by the suggestions of experience.

A certain illusion of which I have not yet spoken affords an additional illustration of this. *When we will to execute a movement and the movement for some reason does not occur, unless the sensation of the part's NOT moving is a strong one, we are apt to feel as if the movement had actually taken place*. This seems habitually to be the case in anæsthesia of the moving parts. Close the patient's eyes, hold his anæsthetic arm still, and tell him to raise his hand to his head; and when he opens his eyes he will be astonished to find that the movement has not taken place. All reports of anæsthetic cases seem to mention this illusion. Sternberg who wrote on the subject in 1885,^[107] lays it down as a law that the intention to move is the same thing as the feeling of the motion. We shall later see that this is false ([Chapter XXV](#)); but it certainly may *suggest* the feeling of the motion with hallucinatory intensity. Sternberg gives the following experiment, which I find succeeds with at least half of those who try it: Rest your palm on the edge of the table with your forefinger hanging over in a position of extreme flexion, and then exert your will to flex it still more. The position of the other fingers makes this impossible, and yet if we do not look to see the finger, we think we feel it move. He quotes from Exner a similar experiment with the jaws: Put some hard rubber or other unindentable

obstacle between your back teeth and bite hard: you think you feel the jaw move and the front teeth approach each other, though in the nature of things no movement can occur.^[108]—The visual suggestion of the path traversed by the finger-tip as the *locus* of the movement—feeling in the joint, which we discussed on [page 41](#), is another example of this semi-hallucinatory power of the suggested thing. Amputated people, as we have learned, still feel their lost feet, etc. This is a necessary consequence of the law of specific energies, for if the central region correlated with the foot give rise to any feeling at all it must give rise to the feeling of a foot.^[109] But the curious thing is that many of these patients can *will the foot to move*, and when they have done so, distinctly *feel the movement to occur*. They can, to use their own language, 'work' or 'wiggle' their lost toes.^[110]

Now in all these various cases we are dealing with data which in normal life are inseparably joined. Of all possible experiences, it is hard to imagine any pair more uniformly and incessantly coupled than the volition to move, on the one hand, and the feeling of the changed position of the parts, on the other. From the earliest ancestors of ours which had feet, down to the present day, the movement of the feet must always have accompanied the will to move them; and here, if anywhere, habit's consequences ought to be found. The process of the willing ought, then, to pour into the process of feeling the command effected, and ought to awaken that feeling in a maximal degree provided no other positively contradictory sensation come in at the same time. In most of us, when the will fails of its effect there is a contradictory sensation. We discern a resistance or the unchanged position of the limb. But neither in anæsthesia nor in amputation can there be any contradictory sensation in the foot to correct us; so imagination has all the force of fact.

'APPERCEPTION.'

In Germany since Herbart's time Psychology has always had a great deal to say about a process called *Apperception*.^[111] The incoming ideas or sensations are said to be 'apperceived' by 'masses' of ideas already in the mind. It is plain that the process we have been describing as perception is, at this rate, an apperceptive process. So are all recognition, classing, and naming; and passing beyond these simplest suggestions, all farther thoughts

about our percepts are apperceptive processes as well. I have myself not used the word apperception because it has carried very different meanings in the history of philosophy,^[112] and 'psychic reaction,' 'interpretation,' 'conception,' 'assimilation,' 'elaboration,' or simply 'thought,' are perfect synonyms for its Herbartian meaning, widely taken. It is, moreover, hardly worth while to pretend to analyze the so-called apperceptive performances beyond the first or perceptive stage, because their variations and degrees are literally innumerable. 'Apperception' is a name for the sum-total of the effects of what we have studied as association; and it is obvious that the things which a given experience will suggest to a man depend on what Mr. Lewes calls his entire psychostatical conditions, his nature and stock of ideas, or, in other words, his character, habits, memory, education, previous experience, and momentary mood. We gain no insight into what really occurs either in the mind or in the brain by calling all these things the 'apperceiving mass,' though of course this may upon occasion be convenient. On the whole I am inclined to think Mr. Lewes's term of 'assimilation' the most fruitful one yet used.^[113]

Professor H. Steinthal has analyzed apperceptive processes with a sort of detail which is simply burdensome.^[114] His introduction of the matter may, however, be quoted. He begins with an anecdote from a comic paper.

"In the compartment of a railway-carriage six persons unknown to each other sit in lively conversation. It becomes a matter of regret that one of the company must alight at the next station. One of the others says that he of all things prefers such a meeting with entirely unknown persons, and that on such occasions he is accustomed neither to ask who or what his companions may be nor to tell who or what he is. Another thereupon says that he will undertake to decide this question, if they each and all will answer him an entirely disconnected question. They began. He drew five leaves from his note-book, wrote a question on each, and gave one to each of his companions with the request that he write the answer below. When the leaves were returned to him, he turned, after reading them, without hesitation to the others, and said to the first, 'You are a man of science'; to the second, 'You are a soldier'; to the third, 'You are a philologist'; to the fourth, 'You are a journalist'; to the fifth, 'You are a farmer.' All admitted that he was right,

whereupon he got out and left the five behind. Each wished to know what question the others had received; and behold, he had given the same question to each. It ran thus:

"What being destroys what it has itself brought forth?"

"To this the naturalist had answered, 'vital force'; the soldier, 'war'; the philologist, 'Kronos'; the publicist, 'revolution'; the farmer, 'a boar'. This anecdote, methinks, if not true, is at least splendidly well invented. Its narrator makes the journalist go on to say: 'Therein consists the joke. Each one answers the first thing that occurs to him, [115] and that is whatever is most newly related to his pursuit in life. Every question is a hole-drilling experiment, and the answer is an opening through which one sees into our interiors.'... So do we all. We are all able to recognize the clergyman, the soldier, the scholar, the business man, not only by the cut of their garments and the attitude of their body, but by what they say and how they express it. We guess the place in life of men by the interest which they show and the way in which they show it, by the objects of which they speak, by the point of view from which they regard things, judge them, conceive them, in short by their mode of *apperceiving*....

"Every man has one group of ideas which relate to his own person and interests, and another which is connected with society. Each has his group of ideas about plants, religion, law, art, etc., and more especially about the rose, epic poetry, sermons, free trade, and the like. Thus the mental content of every individual, even of the uneducated and of children, consists of masses or circles of knowledge of which each lies within some larger circle, alongside of others similarly included, and of which each includes smaller circles within itself.... The perception of a thing like a horse... is a process between the present horse's picture before our eyes, on the one hand, and those fused or interwoven pictures and ideas of all the horses we have ever seen, on the other;... a process between two factors or momenta, of which one existed before the process and was an old possession of the mind (the group of ideas, or concept, namely), whilst the other is but just presented to the mind, and is the immediately supervening factor (the sense-impression). The former apperceives the latter; the latter is apperceived by the former. Out of their combination an apperception-product arises: the

knowledge of the perceived being as a horse. The earlier factor is relatively to the later one active and *a priori*; the supervening factor is given, *a posteriori*, passive.... We may then define Apperception as the movement of two masses of consciousness (Vorstellungsmassen) against each other so as to produce a cognition.

"The *a priori* factor we called active, the *a posteriori* factor passive, but this is only relatively true.... Although the *a priori* moment commonly shows itself to be the more powerful, apperception-processes can perfectly well occur in which the new observation transforms or enriches the apperceiving group of ideas. A child who hitherto has seen none but four-cornered tables apperceives a round one as a table; but by this the apperceiving mass ('table') is enriched. To his previous knowledge of tables comes this new feature that they need not be four-cornered, but may be round. In the history of science it has happened often enough that some discovery, at the same time that it was apperceived, i.e. brought into connection with the system of our knowledge, transformed the whole system. In principle, however, we must maintain that, although either factor is both active and passive, the *a priori* factor is almost always the more active of the two."^[116]

This account of Steinthal's brings out very clearly the *difference between our psychological conceptions and what are called concepts in logic*. In logic a concept is unalterable; but what are popularly called our 'conceptions of things' alter by being used. The aim of 'Science' is to attain conceptions so adequate and exact that we shall never need to change them. There is an everlasting struggle in every mind between the tendency to keep unchanged, and the tendency to renovate, its ideas. Our education is a ceaseless compromise between the conservative and the progressive factors. Every new experience must be disposed of under *some* old head. The great point is to find the head which has to be least altered to take it in. Certain Polynesian natives, seeing horses for the first time, called them pigs, that being the nearest head. My child of two played for a week with the first orange that was given him, calling it a 'ball.' He called the first whole eggs he saw 'potatoes,' having been accustomed to see his 'eggs' broken into a glass, and his potatoes without the skin. A folding pocket-corkscrew he unhesitatingly called 'bad-scissors.' Hardly any one of us can make new heads easily when fresh experiences come. Most of us grow more and more enslaved to the stock conceptions with which we have once become familiar, and less and less capable of assimilating impressions in any but the old ways. Old-fogyism, in short, is the inevitable terminus to which life sweeps us on. Objects which violate our established habits of 'apperception' are simply not taken account of at all; or, if on some occasion we are forced by dint of argument to admit their existence, twenty-four hours later the admission is as if it were not, and every trace of the unassimilable truth has vanished from our thought. Genius, in truth, means little more than the faculty of perceiving in an unhabitual way.

On the other hand, nothing is more congenial, from babyhood to the end of life, than to be able to assimilate the new to the old, to meet each threatening violator or burster of our well-known series of concepts, as it comes in, see through its unwontedness, and ticket it off as an old friend in disguise. This victorious assimilation of the new is in fact the type of all intellectual pleasure. The lust for it is curiosity. The relation of the new to the old, before the assimilation is performed, is wonder. We feel neither curiosity nor wonder concerning things so far beyond us that we have no concepts to refer them to or standards by which to measure them.^[117] The Fuegians, in Darwin's voyage, wondered at the small boats, but took the big

ship as a 'matter of course.' Only what we partly know already inspires us with a desire to know more. The more elaborate textile fabrics, the vaster works in metal, to most of us are like the air, the water, and the ground, absolute existences which awaken no ideas. It is a matter of course that an engraving or a copper-plate inscription should possess that degree of beauty. But if we are shown a *pen*-drawing of equal perfection, our personal sympathy with the difficulty of the task makes us immediately wonder at the skill. The old lady admiring the Academician's picture, says to him: "And is it really all done *by hand*?"

IS PERCEPTION UNCONSCIOUS INFERENCE?

A widely-spread opinion (which has been held by such men as Schopenhauer, Spencer, Hartmann, Wundt, Helmholtz, and lately interestingly pleaded for by M. Binet)^[118] will have it that *perception should be called a sort of reasoning operation, more or less unconsciously and automatically performed*. The question seems at first a verbal one, depending on how broadly the term reasoning is to be taken. If, every time a present sign suggests an absent reality to our mind, we make an inference; and if every time we make an inference we reason; then perception is indubitably reasoning. Only one sees no room in it for any unconscious part. Both associates, the present sign and the contiguous things which it suggests, are above-board, and no intermediary ideas are required. Most of those who have upheld the thesis in question have, however, made a more complex supposition. What they have meant is that perception is a *mediate* inference, and that the middle term is unconscious. When the sensation which I have called 'this' (p. 83, *supra*) is felt, they think that some process like the following runs through the mind:

'This' is M;
but M is A;
therefore 'this' is A.^[119]

Now there seem no good grounds for supposing this additional wheelwork in the mind. The classification of '*this*' as M is itself an act of perception, and should, if all perception were inference, require a still earlier syllogism for its performance, and so backwards *in infinitum*. The only extrication from this coil would be to represent the process in altered guise, thus:

'This' is *like those*;
Those are A;
Therefore 'this' is A.

The major premise here involves no association by contiguity, no *naming* of *those* as M, but only a suggestion of unnamed similar images, a recall of analogous past sensations with which the characters that make up A were habitually conjoined. But here again, what grounds of fact are there for admitting this recall? We are quite unconscious of any such images of the past. And the conception of all the forms of association as resultants of the elementary fact of habit-worn paths in the brain makes such images entirely superfluous for explaining the phenomena in point. Since the brain-process of 'this,' the sign of A, has repeatedly been aroused in company with the process of the full object A, direct paths of irradiation from the one to the other must be already established. And although roundabout paths may also be possible, as from 'this' to 'those,' and then from 'those' to 'A' (paths which would lead to practically the same conclusion as the straighter ones), yet there is no ground whatever for assuming them to be traversed now, especially since appearances point the other way. In *explicit* reasoning, such paths are doubtless traversed; in perception they are in all probability closed. So far, then, from perception being a species of reasoning properly so called, both it and reasoning are co-ordinate varieties of that deeper sort of process known psychologically as the association of ideas, and physiologically as the law of habit in the brain. *To call perception unconscious reasoning is thus either a useless metaphor, or a positively misleading confusion between two different things.*

One more point and we may leave the subject of Perception. *Sir Wm. Hamilton thought that he had discovered a 'great law' which had been wholly overlooked by psychologists, and which, 'simple and universal,' is this: "Knowledge and Feeling,—Perception and Sensation, though always coexistent, are always in the inverse ratio of each other."* Hamilton wrote as if perception and sensation were two coexistent elements entering into a single state of consciousness. Spencer refines upon him by contending that they are two mutually exclusive *states* of consciousness, not two elements

of a single state. If sensation be taken, as both Hamilton and Spencer mainly take it in this discussion, to mean the feeling of *pleasure* or *pain*, there is no doubt that the law, however expressed, is true; and that the mind which is strongly conscious of the pleasantness or painfulness of an experience is *ipso facto* less fitted to observe and analyze its outward cause. [120] Apart from pleasure and pain, however, the law seems but a corollary of the fact that the more concentrated a state of consciousness is, the more vivid it is. When feeling a color, or listening to a tone *per se*, we get it more intensely, notice it better, than when we are aware of it merely as one among many other properties of a total object. The more diffused cerebral excitement of the perceptive state is probably incompatible with quite as strong an excitement of separate parts as the sensational state comports. So we come back here to our own earlier discrimination between the perceptive and the sensational processes, and to the examples which we gave on [pp. 80, 81](#). [121]

HALLUCINATIONS.

Between normal perception and illusion we have seen that there is no break, the *process* being identically the same in both. The last illusions we considered might fairly be called hallucinations. We must now consider the false perceptions more commonly called by that name. [122] In ordinary parlance hallucination is held to differ from illusion in that, whilst there is an object really there in illusion, *in hallucination there is no objective stimulus at all*. We shall presently see that this supposed absence of objective stimulus in hallucination is a mistake, and that hallucinations are often only *extremes* of the perception process, in which the secondary cerebral reaction is out of all normal proportion to the peripheral stimulus which occasions the activity. Hallucinations usually appear abruptly and have the character of being forced upon the subject. But they possess various degrees of apparent *objectivity*. One mistake *in limine* must be guarded against. They are often talked of as mental *images* projected outwards by mistake. But where an hallucination is complete, it is much more than a mental image. *An hallucination is a strictly sensational form of consciousness, as good and true a sensation as if there were a real object there*. The object happens not to be there, that is all.

The milder degrees of hallucination have been designated as *pseudo-hallucinations*. Pseudo-hallucinations and hallucinations have been sharply distinguished from each other only within a few years. Dr. Kandinsky writes of their difference as follows:

"In carelessly questioning a patient we may confound his pseudo-hallucinatory perceptions with hallucinations. But to the unconfused consciousness of the patient himself, even though he be imbecile, the identification of the two phenomena is impossible, at least in the sphere of vision. At the moment of having a pseudo-hallucination of sight, the patient feels himself in an entirely different relation to this subjective sensible appearance, from that in which he finds himself whilst subject to a true visual hallucination. The latter is reality itself; the former, on the contrary, remains always a subjective phenomenon which the individual commonly regards either as sent to him as a sign of God's grace, or as artificially induced by his secret persecutors.... If he knows by his *own experience* what a genuine hallucination is, it is quite impossible for him to mistake the pseudo-hallucination for it.... A concrete example will make the difference clear:

"Dr. N. L.... heard one day suddenly amongst the voices of his persecutors ('coming from a hollow space in the midst of the wall') a rather loud voice impressively saying to him: 'Change your national allegiance.' Understanding this to mean that his only hope consisted in ceasing to be subject to the Czar of Russia, he reflected a moment what allegiance would be better, and resolved to become an English subject. At the same moment he saw a pseudo-hallucinatory lion of natural size, which appeared and quickly laid its fore-paws on his shoulders. He had a lively feeling of these paws as a tolerably painful local pressure (complete hallucination of touch). Then the same voice from the wall said: 'Now you have a lion—now you will rule,' whereupon the patient recollected that the lion was the national emblem of England. The lion appeared to L. very distinct and vivid, but he nevertheless remained conscious, as he afterwards expressed it, that he saw the animal, not with his bodily but with his mental eyes. (After his recovery he called analogous apparitions by the name of 'expressive-plastic ideas.') Accordingly he felt no terror, even though he felt the contact of the claws.... Had the lion been a complete

hallucination, the patient, as he himself remarked after recovery, would have felt great fear, and very likely screamed or taken to flight. Had it been a simple image of the fancy he would not have connected it with the voices, of whose objective reality he was at the time quite convinced."^[123]

From ordinary images of memory and fancy, pseudo-hallucinations differ in being much more vivid, minute, detailed, steady, abrupt, and spontaneous, in the sense that all feeling of our own activity in producing them is lacking. Dr. Kandinsky had a patient who, after taking opium or haschisch, had abundant pseudo-hallucinations and hallucinations. As he also had strong visualizing power and was an educated physician, the three sorts of phenomena could be easily compared. Although projected outwards (usually not farther than the limit of distinctest vision, a foot or so) the pseudo-hallucinations *lacked the character of objective reality* which the hallucinations possessed, but, unlike the pictures of imagination, it was almost impossible to produce them at will. Most of the 'voices' which people hear (whether they give rise to delusions or not) are pseudo-hallucinations. They are described as '*inner*' voices, although their character is entirely unlike the inner speech of the subject with himself. I know two persons who hear such inner voices making unforeseen remarks whenever they grow quiet and listen for them. They are a very common incident of delusional insanity, and at last grow into vivid hallucinations. The latter are comparatively frequent occurrences in sporadic form; and certain individuals are liable to have them often. From the results of the 'Census of Hallucinations,' which was begun by Edmund Gurney, it would appear that, roughly speaking, one person at least in every ten is likely to have had a vivid hallucination at some time in his life.^[124] The following cases from healthy people will give an idea of what these hallucinations are:

"When a girl of eighteen, I was one evening engaged in a very painful discussion with an elderly person. My distress was so great that I took up a thick ivory knitting-needle that was lying on the mantelpiece of the parlor and broke it into small pieces as I talked. In the midst of the discussion I was very wishful to know the opinion of a brother with whom I had an unusually close relationship. I turned round and saw him sitting at the further side of a centre-table, with his arms folded

(an unusual position with him), but, to my dismay, I perceived from the sarcastic expression of his mouth that he was not in sympathy with me, was not 'taking my side,' as I should then have expressed it. The surprise cooled me, and the discussion was dropped.

"Some minutes after, having occasion to speak to my brother, I turned towards him, but he was gone. I inquired when he left the room, and was told that he had not been in it, which I did not believe, thinking that he had come in for a minute and had gone out without being noticed. About an hour and a half afterwards he appeared, and convinced me, with some trouble, that he had never been near the house that evening. He is still alive and well."

Here is another case:

"One night in March 1873 or '74, I cannot recollect which year, I was attending on the sick-bed of my mother. About eight o'clock in the evening I went into the dining-room to fix a cup of tea, and on turning from the sideboard to the table, on the other side of the table before the fire, which was burning brightly, as was also the gas, I saw standing with his hand clasped to his side in true military fashion a soldier of about thirty years of age, with dark, piercing eyes looking directly into mine. He wore a small cap with standing feather; his costume was also of a soldierly style. He did not strike me as being a spirit, ghost, or anything uncanny, only a living man; but after gazing for fully a minute I realized that it was nothing of earth, for he neither moved his eyes nor his body, and in looking closely I could see the fire beyond. I was of course startled, and yet did not run out of the room. I felt stunned. I walked out rapidly, however, and turning to the servant in the hall asked her if she saw anything. She said not. I went into my mother's room and remained talking for about an hour, but never mentioned the above subject for fear of exciting her, and finally forgot it altogether, returning to the dining-room, still in forgetfulness of what had occurred, but repeating, as above, the turning from sideboard to table in act of preparing more tea. I looked casually towards the fire, and there I saw the soldier again. This time I was entirely alarmed, and fled from the room in haste. I called to my father, but when he came he saw nothing."

Sometimes more than one sense is affected. The following is a case:

"In response to your request to write out my experience of Oct. 30, 1886, I will inflict on you a letter.

"On the day above mentioned, Oct. 30, 1886, I was in ——, where I was teaching. I had performed my regular routine work for the day, and was sitting in my room working out trigonometrical formulæ. I was expecting every day to hear of the confinement of my wife, and naturally my thoughts for some time had been more or less with her. She was, by the way, in B——, some fifty miles from me.

"At the time, however, neither she nor the expected event was in my mind; as I said, I was working out trigonometrical formulæ, and I had been working on trigonometry the entire evening. About eleven o'clock, as I sat there buried in sines, cosines, tangents, cotangents, secants, and cosecants, I felt very distinctly upon my left shoulder a touch, and a slight shake, as if somebody had tried to attract my attention by other means and had failed. Without rising I turned my head, and there between me and the door stood my wife, dressed exactly as I last saw her, some five weeks before. As I turned she said: 'It is a little Herman; he has come.' Something more was said, but this is the only sentence I can recall. To make sure that I was not asleep and dreaming, I rose from the chair, pinched myself and walked toward the figure, which disappeared immediately as I rose. I can give no information as to the length of time occupied by this episode, but I know I was awake, in my usual good health. The touch was very distinct, the figure was absolutely perfect, stood about three feet from the door, which was closed, and had not been opened during the evening. The sound of the voice was unmistakable, and I should have recognized it as my wife's voice even if I had not turned and had not seen the figure at all. The tone was conversational, just as if she would have said the same words had she been actually standing there.

"In regard to myself, I would say, as I have already intimated, I was in my usual good health; I had not been sick before, nor was I after the occurrence, not so much as a headache having afflicted me.

"Shortly after the experience above described, I retired for the night and, as I usually do, slept quietly until morning. I did not speculate particularly about the strange appearance of the night before, and though I thought of it some, I did not tell anybody. The following morning I rose, not conscious of having dreamed anything, but I was very firmly impressed with the idea that there was something for me at the telegraph-office. I tried to throw off the impression, for so far as I knew there was no reason for it. Having nothing to do, I went out for a walk; and to help throw off the impression above noted, I walked away from the telegraph-office. As I proceeded, however, the impression became a conviction, and I actually turned about and went to the very place I had resolved not to visit, the telegraph-office. The first person I saw on arriving at said office was the telegraph-operator, who being on terms of intimacy with me, remarked: 'Hello, papa, I've got a telegram for you.' The telegram announced the birth of a boy, weighing nine pounds, and that all were doing well. Now, then, I have no theory at all about the events narrated above; I never had any such experience before nor since; I am no believer in spiritualism, am not in the least superstitious, know very little about 'thought-transference,' 'unconscious cerebration,' etc., etc., but I am absolutely certain about what I have tried to relate.

"In regard to the remark which I heard, 'It is a little Herman,' etc.; I would add that we had previously decided to call the child, if a boy, *Herman*—my own name, by the way."^[125]

The hallucination sometimes carries a change of the general consciousness with it, so as to appear more like a sudden lapse into a dream. The following case was given me by a man of 43, who had never anything resembling it before:

"While sitting at my desk this A. M. reading a circular of the Loyal Legion a very curious thing happened to me, such as I have never experienced. It was perfectly real, so real that it took some minutes to recover from. It seems to me like a direct intromission into some other world. I never had anything approaching it before save when dreaming at night. I was wide awake, of course. But this was the feeling. I had only just sat down and become interested in the circular, when I

seemed to lose myself for a minute and then found myself in the top story of a high building very white and shining and clean, with a noble window immediately at the right of where I sat. Through this window I looked out upon a marvellous reach of landscape entirely new. I never had before such a sense of infinity in nature, such superb stretches of light and color and *cleanness*. I know that for the space of three minutes I was entirely lost, for when I began to come to, so to speak,—sitting in that other world, I debated for three or four minutes more as to which was dream and which was reality. Sitting there I got a faint sense of C.... [the town in which the writer was], away off and dim at first. Then I remember thinking 'Why, I used to live in C....; perhaps I am going back.' Slowly C.... did come back, and I found myself at my desk again. For a few minutes the process of determining where I was was very funny. But the whole experience was perfectly delightful, there was such a sense of brilliancy and clearness and lightness about it. I suppose it lasted in all about seven minutes or ten minutes."

The hallucinations of fever-delirium are a mixture of pseudo-hallucination, true hallucination, and illusion. Those of opium, hasheesh, and belladonna resemble them in this respect. The following vivid account of a fit of hasheesh-delirium has been given me by a friend:

"I was reading a newspaper, and the indication of the approaching delirium was an inability to keep my mind fixed on the narrative. Directly I lay down upon a sofa there appeared before my eyes several rows of human hands, which oscillated for a moment, revolved and then changed to spoons. The same motions were repeated, the objects changing to wheels, tin soldiers, lamp-posts, brooms, and countless other absurdities. This stage lasted about ten minutes, and during that time it is safe to say that I saw at least a thousand different objects. These whirling images did not appear like the realities of life, but had the character of the secondary images seen in the eye after looking at some brightly-illuminated object. A mere suggestion from the person who was with me in the room was sufficient to call up an image of the thing suggested, while without suggestion there appeared all the common objects of life and many unreal monstrosities, which it is

absolutely impossible to describe, and which seemed to be creations of the brain.

"The character of the symptoms changed rapidly. A sort of wave seemed to pass over me, and I became aware of the fact that my pulse was beating rapidly. I took out my watch, and by exercising considerable will-power managed to time the heart-beats, 135 to the minute.

"I could feel each pulsation through my whole system, and a curious twitching commenced, which no effort of the mind could stop.

"There were moments of apparent lucidity, when it seemed as if I could see within myself, and watch the pumping of my heart. A strange fear came over me, a certainty that I should never recover from the effects of the opiate, which was as quickly followed by a feeling of great interest in the experiment, a certainty that the experience was the most novel and exciting that I had ever been through.

"My mind was in an exceedingly impressionable state. Any place thought of or suggested appeared with all the distinctness of the reality. I thought of the Giant's Causeway in Staffa, and instantly I stood within the portals of Fingal's Cave. Great basaltic columns rose on all sides, while huge waves rolled through the chasm and broke in silence upon the rocky shore. Suddenly there was a roar and blast of sound, and the word 'Ishmaral' was echoing up the cave. At the enunciation of this remarkable word the great columns of basalt changed into whirling clothes pins and I laughed aloud at the absurdity.

"(I may here state that the word 'Ishmaral' seemed to haunt my other hallucinations, for I remember that I heard it frequently thereafter.) I next enjoyed a sort of metempsychosis. Any animal or thing that I thought of could be made the being which held my mind. I thought of a fox, and instantly I was transformed into that animal. I could distinctly feel myself a fox, could see my long ears and bushy tail, and by a sort of introvision felt that my complete anatomy was that of a fox. Suddenly the point of vision changed. My eyes seemed to be located at the back of my mouth; I looked out between the parted lips, saw the two rows of pointed teeth, and, closing my mouth with a snap, saw—nothing.

"I was next transformed into a bombshell, felt my size, weight, and thickness, and experienced the sensation of being shot up out of a giant mortar, looking down upon the earth, bursting and falling back in a shower of iron fragments.

"Into countless other objects was I transformed, many of them so absurd that I am unable to conceive what suggested them. For example, I was a little china doll, deep down in a bottle of olive oil, next moment a stick of twisted candy, then a skeleton inclosed in a whirling coffin, and so on *ad infinitum*.

"Towards the end of the delirium the whirling images appeared again, and I was haunted by a singular creation of the brain, which reappeared every few moments. It was an image of a double-faced doll, with a cylindrical body running down to a point like a peg-top.

"It was always the same, having a sort of crown on its head, and painted in two colors, green and brown, on a background of blue. The expression of the Janus-like profiles was always the same, as were the adornments of the body. After recovering from the effects of the drug I could not picture to myself exactly how this singular monstrosity appeared, but in subsequent experiences I was always visited by this phantom, and always recognized every detail of its composition. It was like visiting some long-forgotten spot and seeing some sight that had faded from the memory, but which appeared perfectly familiar as soon as looked upon.

"The effects of the drug lasted about an hour and a half, leaving me a trifle tipsy and dizzy; but after a ten-hour sleep I was myself again, save for a slight inability to keep my mind fixed on any piece of work for any length of time, which remained with me during most of the next day."

THE NEURAL PROCESS IN HALLUCINATION.

Examples of these singular perversions of perception might be multiplied indefinitely, but I have no more space. Let us turn to the question of what the physiological process may be to which they are due. It must, of course, consist of an excitement from within of those centres which are active in

normal perception, identical in kind and degree with that which real external objects are usually needed to induce. The particular process which currents from the sense-organs arouse would seem under normal circumstances to be arousable in no other way. On [p. 72](#) ff. above, we saw that the centres aroused by incoming peripheral currents are probably identical with the centres used in mere imagination; and that the vividness of the sensational kind of consciousness is probably correlated with a discrete degree of *intensity* in the process therein aroused. Referring the reader back to that passage and to what was more lately said on [p. 103](#) ff., I now proceed to complete my theory of the perceptive process by an analysis of what may most probably be believed to take place in hallucination strictly so called.

We have seen ([p. 75](#)) that the free discharge of cells into each other through associative paths is a likely reason why the maximum intensity of function is not reached when the cells are excited by their neighbors in the cortex. At the end of [Chapter XXV](#) we shall return to this conception, and whilst making it still more precise, use it for explaining certain phenomena connected with the will. The idea is that the leakage forward along these paths is too rapid for the inner tension in any centre to accumulate to the maximal explosion-point, unless the exciting currents are greater than those which the various portions of the cortex supply to each other. Currents from the periphery are (as it seems) the only currents whose energy can vanquish the supra-ideational resistance (so to call it) of the cells, and cause the peculiarly intense sort of disintegration with which the sensational quality is linked. *If, however, the leakage forward were to stop*, the tension inside certain cells might reach the explosion-point, even though the influence which excited them came only from neighboring cortical parts. Let an empty pail with a leak in its bottom, tipped up against a support so that if it ever became full of water it would upset, represent the resting condition of the centre for a certain sort of feeling. Let water poured into it stand for the currents which are its natural stimulus; then the hole in its bottom will, of course, represent the 'paths' by which it transmits its excitement to other associated cells. Now let two other vessels have the function of supplying it with water. One of these vessels stands for the neighboring cortical cells, and can pour in hardly any more water than goes out by the leak. The pail consequently never upsets in consequence of the supply from this source. A current of water passes through it and does work elsewhere, but in the pail

itself nothing but what stands for *ideational* activity is aroused. The other vessel, however, stands for the peripheral sense-organs, and supplies a stream of water so copious that the pail promptly fills up in spite of the leak, and presently *upsets*; in other words, *sensational* activity is aroused. But it is obvious that if the leak were plugged, the slower stream of supply would also end by upsetting the pail.

To apply this to the brain and to thought, if we take a series of processes A B C D E, associated together in that order, and suppose that the current through them is very fluent, there will be little intensity anywhere until, perhaps, a pause occurs at E. But the moment the current is blocked anywhere, say between C and D, the process in C must grow more intense, and might even be conceived to explode so as to produce a sensation in the mind instead of an idea.

It would seem that some hallucinations are best to be explained in this way. We have in fact a regular series of facts which can all be formulated under the single law that *the substantive strength of a state of consciousness bears an inverse proportion to its suggestiveness*. It is the halting-places of our thought which are occupied with distinct imagery. Most of the words we utter have no time to awaken images at all; they simply awaken the following words. But when the sentence *stops*, an image dwells for awhile before the mental eye (see Vol. I. p. 243). Again, whenever the associative processes are reduced and impeded by the approach of unconsciousness, as in falling asleep, or growing faint, or becoming narcotized, we find a concomitant increase in the intensity of whatever partial consciousness may survive. In some people what M. Maury has called 'hypnagogic' hallucinations^[126] are the regular concomitant of the process of falling asleep. Trains of faces, landscapes, etc., pass before the mental eye, first as fancies, then as pseudo-hallucinations, finally as full-fledged hallucinations forming dreams. If we regard association-paths as paths of drainage, then the shutting off of one after another of them as the encroaching cerebral paralysis advances ought to act like the plugging of the hole in the bottom of the pail, and make the activity more intense in those systems of cells that retain any activity at all. The level rises because the currents are not drained away, until at last the full sensational explosion may occur.

The usual explanation of hypnagogic hallucinations is that they are ideas deprived of their ordinary *reductives*. In somnolence, sensations being

extinct, the mind, it is said, then having no stronger things to compare its ideas with, ascribes to these the fulness of reality. At ordinary times the objects of our imagination are reduced to the *status* of subjective facts by the ever-present contrast of our sensations with them. Eliminate the sensations, however, this view supposes, and the 'images' are forthwith 'projected' into the outer world and appear as realities. Thus is the illusion of dreams also explained. This, indeed, after a fashion gives an account of the facts.^[127] And yet it certainly fails to explain the extraordinary vivacity and completeness of so many of our dream-fantasms. The process of 'imagining' must (in these cases at least^[128]) be not merely relatively, but absolutely and in itself more intense than at other times. The fact is, it is not a process of imagining, but a genuine sensational process; and the theory in question is therefore false as far as that point is concerned.

Dr. Hughlings Jackson's explanation of the epileptic seizure is acknowledged to be masterly. It involves principles exactly like those which I am bringing forward here. The 'loss of consciousness' in epilepsy is due to the most highly organized brain-processes being exhausted and thrown out of gear. The less organized (more instinctive) processes, ordinarily inhibited by the others, are then exalted, so that we get as a mere consequence of relief from the inhibition, the meaningless or maniacal action which so often follows the attack.^[129]

Similarly the *subsultus tendinorum* or jerking of the muscles which so often startles us when we are on the point of falling asleep, may be interpreted as due to the rise (in certain lower motor centres) of the ordinary 'tonic' tension to the explosion-point, when the inhibition commonly exerted by the higher centres falls too suddenly away.

One possible condition of hallucination then stands revealed, whatever other conditions there may be. *When the normal paths of association between a centre and other centres are thrown out of gear, any activity which may exist in the first centre tends to increase in intensity until finally the point may be reached at which the last inward resistance is overcome, and the full sensational process explodes.*^[130] Thus it will happen that

causes of an amount of activity in brain-cells which would ordinarily result in a weak consciousness may produce a very strong consciousness when the overflow of these cells is stopped by the torpor of the rest of the brain. A slight peripheral irritation, then, if it reaches the centres of consciousness at all during sleep, will give rise to the dream of a violent sensation. All the books about dreaming are full of anecdotes which illustrate this. For example, M. Maury's nose and lips are tickled with a feather while he sleeps. He dreams he is being tortured by having a pitch-plaster applied to his face, torn off, lacerating the skin of nose and lips. Descartes, on being bitten by a flea, dreams of being run through by a sword. A friend tells me, as I write this, of his hair changing its position in his forehead just as he 'dozed off' in his chair a few days since. Instantly he dreamed that some one had struck him a blow. Examples can be quoted *ad libitum*, but these are enough.^[131]

We seem herewith to have an explanation for a certain number of hallucinations. *Whenever the normal forward irradiation of intra-cortical excitement through association-paths is checked, any accidental spontaneous activity or any peripheral stimulation (however inadequate at other times) by which a brain-centre may be visited, sets up a process of full sensational intensity therein.*

In the hallucinations artificially produced in hypnotic subjects, some degree of peripheral excitement seems usually to be required. The brain is asleep as far as its own spontaneous thinking goes, and the words of the 'magnetizer' then awaken a cortical process which drafts off into itself any currents of a related sort which may come in from the periphery, resulting in a vivid objective perception of the suggested thing. Thus, point to a dot on a sheet of paper, and call it 'General Grant's photograph,' and your subject will see a photograph of the General there instead of the dot. The dot gives objectivity to the appearance, and the suggested notion of the General gives it form. Then magnify the dot by a lens; double it by a prism or by nudging the eyeball; reflect it in a mirror; turn it upside down; or wipe it out; and the subject will tell you that the 'photograph' has been enlarged, doubled, reflected, turned about, or made to disappear. In M. Binet's language,^[132]

the dot is the outward *point de repère* which is needed to give objectivity to your suggestion, and without which the latter will only produce a *conception* in the subject's mind.^[133] M. Binet has shown that such a peripheral *point de repère* is used in an enormous number, not only of hypnotic hallucinations, but of hallucinations of the insane. These latter are often *unilateral*; that is, the patient hears the voices always on one side of him, or sees the figure only when a certain one of his eyes is open. In many of these cases it has been distinctly proved that a morbid irritation in the internal ear, or an opacity in the humors of the eye, was the starting point of the current which the patient's diseased acoustic or optical centres clothed with their peculiar products in the way of ideas. *Hallucinations produced in this way are 'ILLUSIONS' and M. Binet's theory, that all hallucinations must start in the periphery, may be called an attempt to reduce hallucination and illusion to one physiological type, the type, namely, to which normal perception belongs.* In every case, according to M. Binet, whether of perception, of hallucination, or of illusion, we get the sensational vividness by means of a current from the peripheral nerves. It may be a mere trace of a current. But that trace is enough to kindle the maximal or supra-ideational process so that the object perceived will have the character of *externality*. What the *nature* of the object shall be will depend wholly on the particular system of paths in which the process is kindled. Part of the thing in all cases comes from the sense-organ, the rest is furnished by the mind. But we cannot by introspection distinguish between these parts; and our only formula for the result is that the brain has *reacted on* the impression in the normal way. Just so in the dreams which we have considered, and in the hallucinations of which M. Binet tells, we can only say that the brain has *reacted* in an abnormal way.

M. Binet's theory accounts indeed for a multitude of cases, but certainly not for all. The prism does not always double the false appearance,^[134] nor does the latter always disappear when the eyes are closed. Dr. Hack Tuke^[135] gives several examples in sane people of well-exteriorized hallucinations which did not respond to Binet's tests; and Mr. Edmund Gurney^[136] gives a number of reasons why intensity in a cortical process may be expected to result from local pathological activity just as much as its peculiar nature does. For Binet, an abnormally or exclusively active part of the cortex gives the *nature* of what shall appear, whilst a peripheral

sense-organ alone can give the *intensity* sufficient to make it appear projected into real space. But since this intensity is after all but a matter of degree, one does not see why, under rare conditions, the degree in question *might* not be attained by inner causes exclusively. In that case we should have certain hallucinations centrally initiated alongside of the peripherally initiated hallucinations, which are the only sort that M. Binet's theory allows. *It seems probable on the whole, therefore, that centrally initiated hallucinations can exist.* How often they do exist is another question. The existence of hallucinations which affect more than one sense is an argument for central initiation. For grant that the thing seen may have its starting point in the outer world, the voice which it is heard to utter must be due to an influence from the visual region, i.e. must be of central origin.

Sporadic cases of hallucination, visiting people only once in a lifetime (which seem to be by far the most frequent type), are on any theory hard to understand in detail. They are often extraordinarily complete; and the fact that many of them are reported as *veridical*, that is, as coinciding with real events, such as accidents, deaths, etc., of the persons seen, is an additional complication of the phenomenon. The first really scientific study of hallucination in all its possible bearings, on the basis of a large mass of empirical material, was begun by Mr. Edmund Gurney and is continued by other members of the Society for Psychical Research; and the 'Census' is now being applied to several countries under the auspices of the International Congress of Experimental Psychology. It is to be hoped that out of these combined labors something solid will eventually grow. The facts shade off into the phenomena of motor automatism, trance, etc.; and nothing but a wide comparative study can give really instructive results.^[137]

The part played by the peripheral sense-organ in hallucination is just as obscure as we found it in the case of imagination. The things seen often seem opaque and hide the background upon which they are projected. It does not follow from this, however, that the retina is actually involved in the vision. A contrary process going on in the visual centres would prevent the retinal impression made by the outer realities from being felt, and this would in mental terms be equivalent to the hiding of them by the imaginary figure. The negative after-images of mental pictures reported by Meyer and Féré, and the negative after-images of hypnotic hallucinations reported by Binet and others so far constitute the only evidence there is for the retina

being involved. But until these after-images are explained in some other way we must admit the possibility of a centrifugal current from the optical centres downwards into the peripheral organ of sight, paradoxical as the course of such a current may appear.

'PERCEPTION-TIME.'

The time which the perceptive process occupies has been inquired into by various experimenters. Some call it perception-time, some choice-time, some discrimination-time. The results have been already given in Chapter XIII (vol. I, p. 523 ff.), to which the reader is consequently referred.

Dr. Romanes gives an interesting variation of these time-measurements. He found^[138]

"an astonishing difference between different individuals with respect to the rate at which they are able to *read*. Of course reading implies enormously intricate processes of perception both of the sensuous and of the intellectual order; but if we choose for these observations persons who have been accustomed to read much, we may consider that they are all very much on a par with respect to the amount of practice which they have had, so that the differences in their rates of reading may fairly be attributed to real differences in their rates of forming complex perceptions in rapid succession, and not to any merely accidental differences arising from greater or less facility acquired by special practice.

"My experiments consisted in marking a brief printed paragraph in a book which had never been read by any of the persons to whom it was to be presented. The paragraph, which contained simple statements of simple facts, was marked on the margin with pencil. The book was then placed before the reader open, the page, however, being covered with a sheet of paper. Having pointed out to the reader upon this sheet of paper what part of the underlying page the marked paragraph occupied, I suddenly removed the sheet of paper with one hand, while I started a chronograph with the other. Twenty seconds being allowed for reading the paragraph (ten lines octavo), as soon as the time was up I again suddenly placed the sheet of paper over the printed page,

passed the book on to the next reader, and repeated the experiment as before. Meanwhile, the first reader, the moment after the book had been removed, wrote down all that he or she could remember having read. And so on with all the other readers.

"Now the results of a number of experiments conducted on this method were to show, as I have said, astonishing differences in the *maximum* rate of reading which is possible to different individuals, all of whom have been accustomed to extensive reading. That is to say, the difference may amount to 4 to 1; or, otherwise stated, in a given time one individual may be able to read four times as much as another. Moreover, it appeared that there was no relationship between slowness of reading and power of assimilation; on the contrary, when all the efforts are directed to assimilating as much as possible in a given time, the rapid readers (as shown by their written notes) usually give a better account of the portions of the paragraph which have been compassed by the slow readers than the latter are able to give; and the most rapid reader I have found is also the best at assimilating. I should further say that there is no relationship between rapidity of perception as thus tested and intellectual activity as tested by the general results of intellectual work; for I have tried the experiment with several highly distinguished men in science and literature, most of whom I found to be slow readers."^[139]

[83] The word Perception, however, has been variously used. For historical notices, see Hamilton's Lectures on Metaphysics, ii. 96. For Hamilton perception is 'the consciousness of external objects' (*ib.* 28). Spencer defines it oddly enough as "a discerning of the relation or relations between *states of consciousness* partly presentative and partly representative; which states of consciousness must be themselves known to the extent involved in the knowledge of their relations" (Psychol., § 355).

[84] Analysis, i. 97.

[85] Theory of Vision, 51.

[86] The educative process is particularly obvious in the case of the ear, for all sudden sounds seem alarming to babies. The familiar noises of house and street keep them in constant trepidation until such time as they have either learned the objects which emit them, or have become blunted to them by frequent experience of their innocuity.

[87] Outlines, p. 153.

[88] Cf. Helmholtz, Optik, pp. 433, 723, 728, 772; and Spencer, Psychology, vol. ii. p. 249, note.

[89] The more or less geometrically regular phantasms which are produced by pressure on the eyeballs, congestion of the head, inhalation of anæsthetics, etc., might again be cited to prove that faint and vague excitements of sense-organs are transformed into figured objects by the brain, only the facts are not quite clearly interpretable; and the figuring may possibly be due to some retinal peculiarity, as yet unexplored. Beautiful patterns, which would do for wall-papers, succeed each other when the eyeballs are long pressed. Goethe's account of his own phantasm of a flower is well known. It came in the middle of his visual field whenever he closed his eyes and depressed his head, "unfolding itself and developing from its interior new flowers, formed of colored or sometimes green leaves, not natural but of fantastic forms, and symmetrical as the rosettes of sculptors," etc. (quoted in Müller's Physiology, Baly's tr., p. 1397). The fortification- and zigzag-patterns, which are well-known appearances in the field of view in certain functional disorders, have characteristics (steadiness, coerciveness, blotting out of other objects) suggestive of a retinal origin—this is why the entire class of phenomena treated of in this note seem to me still doubtfully connected with the cerebral factor in perception of which the text treats.—I copy from Taine's book on Intelligence (vol. i. p. 61) the translation of an interesting observation by Prof. M. Lazarus, in which the same effect of an after-image is seen. Lazarus himself proposes the name of 'visionary illusions' for such modifications of ideal pictures by peripheral stimulations (Lehre von den Sinnestäuschungen, 1867, p. 19). "I was on the Kaltbad terrace at Rigi, on a very clear afternoon, and attempting to make out the Waldbruder, a rock which stands out from the midst of the gigantic wall of mountains surrounding it, on whose summits we see like a crown the glaciers of Titlis, Uri-Rothsdoek, etc. I was looking alternately with the naked eye and with a spy-glass; but could not distinguish it with the naked eye. For the space of six to ten minutes I had gazed steadfastly upon the mountains, whose color varied according to their several altitudes or declivities between violet, brown, and dark green, and I had fatigued myself to no purpose, when I ceased looking and turned away. At that moment I saw before me (I cannot recollect whether my eyes were shut or open) the figure of an absent friend, like a corpse.... I asked myself at once how I had come to think of my absent friend.—In a few seconds I regained the thread of my thoughts, which my looking for the Waldbruder had interrupted, and readily found that the idea of my friend had by a very simple necessity introduced itself among them. My recollecting him was thus naturally accounted for.—But in addition to this, he had appeared as a corpse. How was this?—At this moment, whether through fatigue or in order to think, I closed my eyes, and found at once the whole field of sight, over a considerable extent, covered with the same corpse-like hue, a greenish-yellow gray. I thought at once that I had here the principle of the desired explanation, and attempted to recall to memory the forms of other persons. And, in fact, these forms too appeared like corpses; standing or sitting, as I wished, all had a corpse-like tint. The

persons whom I wished to see did not all appear to me as sensible phantoms; and again, when my eyes were open. I did not see phantoms, or at all events only saw them faintly, of no determined color.—I then inquired how it was that phantoms of persons were affected by and colored like the visual field surrounding them, how their outlines were traced, and if their faces and clothes were of the same color. But it was then too late, or perhaps the influence of reflection and examination had been too powerful. All grew suddenly pale, and the subjective phenomenon, which might have lasted some minutes longer, had disappeared.—It is plain that here an inward reminiscence, arising in accordance with the laws of association, had combined with an optical after-image. The excessive excitation of the periphery of the optic nerve, I mean the long-continued preceding sensation of my eyes when contemplating the color of the mountain, had indirectly provoked a subjective and durable sensation, that of the complementary color; and my reminiscence, incorporating itself with this subjective sensation, became the corpse-like phantom I have described."

[90] Cf. Th. Reid's *Intellectual Powers*, essay ii. chap. xxii, and A. Binet, in *Mind*, ix. 206. M. Binet points out the fact that what is fallaciously inferred is always an object of some other sense than the 'this.' 'Optical illusions' are generally errors of touch and muscular sensibility, and the fallaciously perceived object and the experiences which correct it are both tactile in these cases.

[91] The converse illusion is hard to bring about. The points *a* and *b*, being normally in contact, mean to us the same space, and hence it might be supposed that when simultaneously touched, as by a pair of callipers, we should feel but one object, whilst as a matter of fact we feel two. It should be remarked in explanation of this that an object placed between the two fingers in their normal uncrossed position always awakens the sense of *two contacts*. When the fingers are *pressed together* we feel *one object* to be between them. And when the fingers are crossed, and their corresponding points *a* and *b* simultaneously *pressed*, we do get something like the illusion of singleness—that is, we get a very doubtful doubleness.

[92] Purkinje, Mach, and Breuer are the authors to whom we mainly owe the explanation of the feeling of vertigo. I have found (*American Journal of Otology*, Oct. 1882) that in deaf-mutes (whose semi-circular canals or entire auditory nerves must often be disorganized) there very frequently exists no susceptibility to giddiness or whirling.

[93] The involuntary continuance of the eye's motions is not the only cause of the false perception in these cases. There is also a true negative after-image of the original retinal movement-sensations, as we shall see in [Chapter XX](#).

[94] We never, so far as I know, get the converse illusion at a railroad station and believe the other train to move when it is still.

[95] Helmholtz: *Physiol. Optik*, 365.

[96] Cf. Berkeley's *Theory of Vision*, §§ 67-79; Helmholtz: *Physiologische Optik*, pp. 630-1; Lechallas in *Revue Philosophique*, xxvi. 49.

[97] *Physiol. Optik*, p. 602.

[98] It seems likely that the strains in the *recti* muscles have something to do with the vacillating judgment in these atropin cases. The internal *recti* contract whenever we accommodate. They squint and produce double vision when the innervation for accommodation is excessive. To see singly, when straining the atropinized accommodation, the contraction of our internal *recti* must be neutralized by a correspondingly excessive contraction of the external *recti*. But this is a sign of the object's recession, etc.

[99] *American Journal of Psychology*, i. 101 ff.

[100] Romanes, *Mental Evolution in Animals*, p. 324.

[101] M. Lazarus: *Das Leben d. Seele*, ii (1857), p. 32. In the ordinary hearing of speech half the words we seem to hear are supplied out of our own head. A language with which we are perfectly familiar is understood, even when spoken in low tones and far off. An unfamiliar language is unintelligible under these conditions. If we do not get a very good seat at a foreign theatre, we fail to follow the dialogue; and what gives trouble to most of us when abroad is not only that the natives speak so fast, but that they speak so indistinctly and so low. The verbal objects for interpreting the sounds by are not alert and ready made in our minds, as they are in our familiar mother-tongue, and do not start up at so faint a cue.

[102] G. H. Meyer, *Untersuchungen*, etc., pp. 242-8.

[103] Helmholtz, P. O. 438. The question will soon come before us again in the chapter on the Perception of Space.

[104] C. F. Taylor, *Sensation and Pain*, p. 37 (N. Y., 1882).

[105] *Examen Critique de la Loi Psychophysique* (1883), p. 61.

[106] Compare A. W. Volkmann's essay 'Ueber Ursprüngliches und Erworbenes in den Raumschauungen,' on p. 139 of his *Untersuchungen im Gebiete der Optik*; and Chapter xiii of Hering's contribution to Hermann's *Handbuch der Physiologie*, vol. iii.

[107] In the Proceedings of the American Society for Psychical Research, pp. 253-4, I have tried to account for some of the variations in this consciousness. Out of 140 persons whom I found to feel their lost foot, some did so *dubiously*. "Either they only feel it occasionally, or only when it pains them, or only when they try to move it; or they only feel it when they 'think a good deal about it' and make an effort to conjure it up. When they 'grow inattentive,' the feeling 'flies back' or 'jumps back,' to the stump. Every degree of consciousness, from complete and permanent hallucination down to something hardly distinguishable from ordinary fancy, seems represented in the sense of the missing extremity which these patients say they have. Indeed I have seldom seen a more plausible lot of evidence for the view that imagination and sensation are but differences of vividness in an identical process than these confessions, taking them altogether, contain. Many patients say they can hardly tell whether they feel or fancy the limb."

[108] Pflüger's *Archiv*, xxxvii. 1.

[109] Not all patients have this additional illusion.

[110] I ought to say that in *almost* all cases the volition is followed by actual contraction of muscles in the *stump*.

[111] Cf. Herbart, *Psychol. als. Wissenschaft*, § 125.

[112] Compare the historical reviews by K. Lange: *Ueber Apperception* (Plauen, 1879), pp. 12-14; by Staude in *Wundt's Philosophische Studien*, i. 149; and by Marty in *Vierteljsch. f. wiss. Phil.*, x. 347 ff.

[113] *Problems*, vol. i. p. 118 ff.

[114] See his *Einleitung in die Psychologie u. Sprachwissenschaft* (1881) p. 166 ff.

[115] One of my colleagues, asking himself the question after reading the anecdote, tells me that he replied 'Harvard College,' the faculty of that body having voted, a few days previously, to keep back the degrees of members of the graduating class who might be disorderly on class-day night. W. J.

[116] *Op. cit.* pp. 166-171.

[117] The great maxim in pedagogy is to knit every new piece of knowledge on to a pre-existing curiosity—i.e., to assimilate its matter in some way to what is already known. Hence the advantage

of "comparing all that is far off and foreign to something that is near home, of making the unknown plain by the example of the known, and of connecting all the instruction with the personal experience of the pupil.... If the teacher is to explain the distance of the sun from the earth, let him ask.... 'If anyone there in the sun fired off a cannon straight at you, what should you do?' 'Get out of the way' would be the answer. 'No need of that,' the teacher might reply. 'You may quietly go to sleep in your room, and get up again, you may wait till your confirmation-day, you may learn a trade, and grow as old as I am,—*then* only will the cannon-ball be getting near, *then* you may jump to one side! See, so great as that is the sun's distance!'" (K. Lange, Ueber Apperception, 1879, p. 76—a charming though prolix little work.)

[118] A. Schopenhauer, Satz vom Grunde, chap. iv. H. Spencer, Psychol., part vi. chaps. ix, x. E. v. Hartmann, Phil. of the Unconscious (B), chaps. vii, viii. W. Wundt, Beiträge, pp. 422 ff.; Vorlesungen, iv, xiii. H. Helmholtz, Physiol. Optik, pp. 430, 447. A. Binet, Psychol. du Raisonnement, chaps. iii, v. Wundt and Helmholtz have more recently 'recanted.' See above, vol i. p. 169 note.

[119] When not all M, but only some M, is A, when, in other words, M is 'undistributed' the conclusion is liable to error. Illusions would thus be *logical fallacies*, if true perceptions were valid syllogisms. They would draw false conclusions from undistributed middle terms.

[120] See Spencer, Psychol., ii. p. 250, note, for a physiological hypothesis to account for this fact.

[121] Here is another good example, taken from Helmholtz's Optics, p. 435: "The sight of a man walking is a familiar spectacle to us. We perceive it as a connected whole, and at most notice the most striking of its peculiarities. Strong attention is required, and a special choice of the point of view, in order to feel the perpendicular and lateral oscillations of such a walking figure. We must choose fitting points or lines in the background with which to compare the positions of its head, but if a distant walking man be looked at through an astronomical telescope (which inverts the object), what a singular hopping and rocking appearance he presents! No difficulty now in seeing the body's oscillations, and many other details of the gait.... But, on the other hand, its total character, whether light or clumsy, dignified or graceful, is harder to perceive than in the upright position."

[122] Illusions and hallucinations must both be distinguished from *delusions*. A delusion is a false opinion about a matter of fact, which need not necessarily involve, though it often does involve, false perceptions of sensible things. We may, for example, have religious delusions, medical delusions, delusions about our own importance, about other peoples' characters, etc., *ad libitum*. The delusions of the insane are apt to affect certain typical forms, often very hard to explain. But in many cases they are certainly theories which the patients invent to account for their abnormal bodily sensations. In other cases they are due to hallucinations of hearing and of sight. Dr. Clouston (Clinical Lectures on Mental Disease, lecture iii *ad fin.*) gives the following special delusions as having been found in about a hundred melancholy female patients who were afflicted in this way. There were delusions of

general persecution;	being destitute;
general suspicion;	being followed by the police;
being poisoned;	being very wicked;
being killed;	impending death;
being conspired against;	impending calamity;
being defrauded;	the soul being lost;
being preached against in church;	having no stomach;

being pregnant;	having no inside;
having a bone in the throat;	having neither stomach nor brains;
having lost much money;	being covered with vermin;
being unfit to live;	letters being written about her;
that she will not recover;	property being stolen;
that she is to be murdered;	her children being killed;
that she is to be boiled alive;	having committed theft;
that she is to be starved;	the legs being made of glass;
that the flesh is boiling;	having horns on the head;
that the head is severed	being chloroformed;
from the body;	having committed murder;
that children are burning;	fear of being hanged;
that murders take place around;	being called names by person;
that it is wrong to take food;	being acted on by spirits;
being in hell;	being a man;
being tempted of the devil;	the body being transformed;
being possessed of the devil;	insects coming from the body;
having committed an	rape being practised on her;
unpardonable sin;	having a venereal disease;
unseen agencies working;	being a fish;
her own identity;	being dead;
being on fire;	having committed suicide of the soul.

[123] V. Kandinsky: Kritische u. Klinische Betrachtungen im Gebiete d. Sinnestäuschungen (1886), p. 42.

[124] See Proceedings of Soc. for Psych. Research, Dec. 1889, pp. 7, 183. The International Congress for Experimental Psychology has now charge of the Census, and the present writer is its agent for America.

[125] This case is of the class which Mr. Myers terms 'veridical.' In a subsequent letter the writer informs me that his vision occurred some five hours *before* the child was born.

[126] Le Sommeil et les Rêves (1865), chaps. iii, iv.

[127] This theory of incomplete rectification of the inner images by their usual reductives is most brilliantly stated by M. Taine in his work on Intelligence, book ii. chap. i.

[128] Not, of course, in all cases, because the cells remaining active are themselves on the way to be overpowered by the general (unknown) condition to which sleep is due.

[129] For a full account of Jackson's theories, see his 'Croonian Lectures' published in the Brit. Med. Journ. for 1884. Cf. also his remarks in the Discussion of Dr. Mercier's paper on Inhibition in 'Brain,' xi. 361.

The loss of vivacity in the images in the process of waking, as well as the gain of it in falling asleep, are both well described by M. Taine, who writes (on Intelligence, i. 50, 58) that often in the daytime, when fatigued and seated in a chair, it is sufficient for him to close one eye with a handkerchief, when, "by degrees, the sight of the other eye becomes vague, and it closes. All external sensations are gradually effaced, or cease, at all events, to be remarked; the internal images, on the other hand, feeble and rapid during the state of complete wakefulness, become intense, distinct, colored, steady, and lasting: there is a sort of ecstasy, accompanied by a feeling of expansion and of comfort. Warned by frequent experience, I know that sleep is coming on, and that I must not disturb the rising vision; I remain passive, and in a few minutes it is complete. Architecture, landscapes, moving figures, pass slowly by, and sometimes remain, with incomparable clearness of form and fulness of being; sleep comes on, and I know no more of the real world I am in. Many times, like M. Maury, I have caused myself to be gently roused at different moments of this state, and have thus been able to mark its characters.—The intense image which seems an external object is but a more forcible continuation of the feeble image which an instant before I recognized as internal; some scrap of a forest, some house, some person which I vaguely imagined on closing my eyes, has in a minute become present to me with full bodily details, so as to change into a complete hallucination. Then, waking up on a hand touching me, I feel the figure decay, lose color, and evaporate: what had appeared a substance is reduced to a shadow.... In such a case, I have often seen, for a passing moment, the image *grow pale*, waste away, and evaporate; sometimes, on opening the eyes, a fragment of landscape or the skirt of a dress appears still to float over the fire-irons or on the black hearth." This persistence of dream-objects for a few moments after the eyes are opened seems to be no extremely rare experience. Many cases of it have been reported to me directly. Compare Müller's Physiology, Baly's tr., p. 945.

[130] I say the 'normal' paths, because hallucinations are not incompatible with *some* paths of association being left. Some hypnotic patients will not only have hallucinations of objects suggested to them, but will amplify them and act out the situation. But the paths here seem excessively narrow, and the reflections which ought to make the hallucination incredible do not occur to the subject's mind. In general, the narrower a train of 'ideas' is, the vividder the consciousness is of each. Under ordinary circumstances, the entire brain probably plays a part in draining any centre which may be ideationally active. When the drainage is reduced in any way it probably makes the active process more intense.

[131] M. A. Maury gives a number: *op. cit.* pp. 126-8.

[132] M. Binet's highly important experiments, which were first published in vol. XVII of the Revue Philosophique (1884), are also given in full in chapter ix of his and Féré's work on 'Animal Magnetism' in the International Scientific Series. Where there is no dot on the paper, nor any other visible mark, the subject's judgment about the 'portrait' would seem to be guided by what he sees happening to the entire sheet.

[133] It is a difficult thing to distinguish in a hypnotic patient between a genuine sensorial hallucination of something suggested and a conception of it merely, coupled with belief that it is there. I have been surprised at the vagueness with which such subjects will often trace upon blank paper the outlines of the pictures which they say they 'see' thereupon. On the other hand, you will hear them say that they find no difference between a real flower which you show them and an imaginary flower which you tell them is beside it. When told that one is imaginary and that they must pick out the real one, they sometimes say the choice is impossible, and sometimes they point to the imaginary flower.

[134] Only the other day, to three hypnotized girls, I failed to double a hallucination with a prism. Of course it may not have been a fully-developed hallucination.

[135] Brain, xi. 441.

[136] Mind, x. 161, 316; and Phantasms of the Living (1886), i. 470-488.

[137] In Mr. Gurney's work, just cited, a very large number of veridical cases are critically discussed.

[138] Mental Evolution in Animals, p. 186.

[139] *Literature.* The best treatment of perception with which I am acquainted is that in Mr. James Sully's book on 'Illusions' in the International Scientific Series. On hallucinations the literature is large. Gurney, Kandinsky (as already cited), and some articles by Kraepelin in the *Vierteljahrschrift für Wissenschaftliche Philosophie*, vol. v (1881), are the most systematic studies recently made. All works on Insanity treat of them. Dr. W. W. Ireland's works, 'The Blot upon the Brain' (1886) and 'Through the Ivory Gate' (1890) have much information on the subject. Gurney gives pretty complete references to older literature. The most important thing on the subject from the point of view of theory is the article by Mr. Myers on the Demon of Socrates in the Proceedings of the Society for Psychical Research for 1889, p. 522.

CHAPTER XX.

THE PERCEPTION OF SPACE.^[140]

THE FEELING OF CRUDE EXTENSIVITY.

In the sensations of hearing, touch, sight, and pain we are accustomed to distinguish from among the other elements the element of voluminousness. We call the reverberations of a thunderstorm more voluminous than the squeaking of a slate-pencil; the entrance into a warm bath gives our skin a more massive feeling than the prick of a pin; a little neuralgic pain, fine as a cobweb, in the face, seems less extensive than the heavy soreness of a boil or the vast discomfort of a colic or a lumbago; and a solitary star looks smaller than the noonday sky. In the sensation of dizziness or subjective motion, which recent investigation has proved to be connected with stimulation of the semi-circular canals of the ear, the spatial character is very prominent. Whether the 'muscular sense' directly yields us knowledge of space is still a matter of litigation among psychologists. Whilst some go so far as to ascribe our entire cognition of extension to its exclusive aid, others deny to it all extensive quality whatever. Under these circumstances

we shall do better to adjourn its consideration; admitting, however, that it seems at first sight as if we felt something decidedly more voluminous when we contract our thigh-muscles than when we twitch an eyelid or some small muscle in the face. It seems, moreover, as if this difference lay in the feeling of the thigh-muscles themselves.

In the sensations of smell and taste this element of varying vastness seems less prominent but not altogether absent. Some tastes and smells appear less extensive than complex flavors, like that of roast meat or plum pudding, on the one hand, or heavy odors like musk or tuberose, on the other. The epithet *sharp* given to the acid class would seem to show that to the popular mind there is something narrow and, as it were, streaky, in the impression they make, other flavors and odors being bigger and rounder.

The sensations derived from the inward organs are also distinctly more or less voluminous. Repletion and emptiness, suffocation, palpitation, headache, are examples of this, and certainly not less spatial is the consciousness we have of our general bodily condition in nausea, fever, heavy drowsiness, and fatigue. Our entire cubic content seems then sensibly manifest to us as such, and feels much larger than any local pulsation, pressure, or discomfort. Skin and retina are, however, the organs in which the space-element plays the most active part. Not only does the maximal vastness yielded by the retina surpass that yielded by any other organ, but the intricacy with which our attention can subdivide this vastness and perceive it to be composed of lesser portions simultaneously coexisting alongside of each other is without a parallel elsewhere.^[141] The ear gives a greater vastness than the skin, but is considerably less able to subdivide it.^[142]

Now my first thesis is that this element, discernible in each and every sensation, though more developed in some than in others, is the original sensation of space, out of which all the exact knowledge about space that we afterwards come to have is woven by processes of discrimination, association, and selection. 'Extensity,' as Mr. James Ward calls it,^[143] on this view, becomes an element in each sensation just as intensity is. The

latter every one will admit to be a distinguishable though not separable ingredient of the sensible quality. In like manner extensity, being an entirely peculiar kind of feeling indescribable except in terms of itself, and inseparable in actual experience from some sensational quality which it must accompany, can itself receive no other name than that of *sensational element*.

It must now be noted that *the vastness hitherto spoken of is as great in one direction as in another*. Its dimensions are so vague that in it there is no question as yet of surface as opposed to depth; 'volume' being the best short name for the sensation in question. *Sensations of different orders are roughly comparable, inter se, with respect to their volumes*. This shows that the spatial quality in each is identical wherever found, for different qualitative elements, e.g. warmth and odor, are incommensurate. Persons born blind are reported surprised at the largeness with which objects appear to them when their sight is restored. Franz says of his patient cured of cataract: "He saw everything much larger than he had supposed from the idea obtained by his sense of touch. Moving, and especially living, objects appeared very large."^[144] Loud sounds have a certain enormousness of feeling. It is impossible to conceive of the explosion of a cannon as filling a small space. In general, sounds seem to occupy all the room between us and their source; and in the case of certain ones, the cricket's song, the whistling of the wind, the roaring of the surf, or a distant railway train, to have no definite starting point.

In the sphere of vision we have facts of the same order. 'Glowing' bodies, as Hering says, give us a perception "which seems *roomy (raumhaft)* in comparison with that of strictly surface color. A glowing iron looks luminous through and through, and so does a flame."^[145] A luminous fog, a band of sunshine, affect us in the same way. As Hering urges:

"We must distinguish *roomy* from superficial, as well as distinctly from indistinctly bounded, sensations. The dark which with closed eyes one sees before one is, for example, a roomy sensation. We do not see a black surface like a wall in front of us, but a space filled with darkness, and even when we succeed in seeing this darkness as terminated by a black wall there still remains in front of this wall the dark space. The same thing happens when we find ourselves with open

eyes in an absolutely dark room. This sensation of darkness is also vaguely bounded. An example of a distinctly bounded roomy sensation is that of a clear and colored fluid seen in a glass; the yellow of the wine is seen not only on the bounding surface of the glass; the yellow sensation fills the whole interior of the glass. By day the so-called empty space between us and objects seen appears very different from what it is by night. The increasing darkness settles not only upon the things but also *between* us and the things, so as at last to cover them completely and fill the space alone. If I look into a dark box I find it *filled* with darkness, and this is seen not merely as the dark-colored sides or walls of the box. A shady corner in an otherwise well-lighted room is full of a darkness which is not only *on* the walls and floor but *between* them in the space they include. Every sensation is there where I experience it, and if I have it at once at every point of a certain roomy space, it is then a voluminous sensation. A cube of transparent green glass gives us a spatial sensation; an opaque cube painted green, on the contrary, only sensations of surface."^[146]

There are certain quasi-motor sensations in the head when we change the direction of the attention, which equally seem to involve three dimensions. If with closed eyes we think of the top of the house and then of the cellar, of the distance in front of us and then of that behind us, of space far to the right and then far to the left, we have something far stronger than an idea,—an actual feeling, namely, as if something in the head moved into another direction. Fechner was, I believe, the first to publish any remarks on these feelings. He writes as follows:

"When we transfer the attention from objects of one sense to those of another we have an indescribable feeling (though at the same time one perfectly determinate and reproducible at pleasure) of altered direction, or differently localized tension (*Spannung*). We feel a strain forward in the eyes, one directed sideways in the ears, increasing with the degree of our attention, and changing according as we look at an object carefully, or listen to something attentively; wherefore we speak of *straining the attention*. The difference is most plainly felt when the attention vibrates rapidly between eye and ear. This feeling localizes itself with most decided difference in regard to the various sense-

organs according as we wish to discriminate a thing delicately by touch, taste, or smell.

"But now I have, when I try to vividly recall a picture of memory or fancy, a feeling perfectly analogous to that which I experience when I seek to grasp a thing keenly by eye or ear; and this analogous feeling is very differently localized. While in sharpest possible attention to real objects (as well as to after-images) the strain is plainly forwards, and, when the attention changes from one sense to another, only alters its direction between the sense-organs, leaving the rest of the head free from strain, the case is different in memory or fancy; for here the feeling withdraws entirely from the external sense-organs, and seems rather to take refuge in that part of the head which the brain fills. If I wish, for example, to recall a place or person, it will arise before me with vividness, not according as I strain my attention forwards, but rather in proportion as I, so to speak, retract it backwards."^[147]

It appears probable that the feelings which Fechner describes are in part constituted by imaginary semi-circular canal sensations.^[148] These undoubtedly convey the most delicate perception of change in direction; and when, as here, the changes are not perceived as taking place in the external world, they occupy a vague internal space located within the head.^[149]

In the skin itself there is a vague form of projection into the third dimension to which Hering has called attention.

"Heat is not felt only against the cutaneous surface, but when communicated through the air may appear extending more or less out from the surface into the third dimension of surrounding space.... We can determine in the dark the place of a radiant body by moving the hand to and fro, and attending to the fluctuation of our feeling of warmth. The feeling itself, however, is not projected fully into the spot at which we localize the hot body, but always remains in the neighborhood of the hand."

The interior of one's mouth-cavity feels larger when explored by the tongue than when looked at. The crater of a newly-extracted tooth, and the movements of a loose tooth in its socket, feel quite monstrous. A midge

buzzing against the drum of the ear will often seem as big as a butterfly. The spatial sensibility of the tympanic membrane has hitherto been very little studied, though the subject will well repay much trouble. If we approach it by introducing into the outer ear some small object like the tip of a rolled-up tissue-paper lamplighter, we are surprised at the large radiating sensation which its presence gives us, and at the sense of clearness and openness which comes when it is removed. It is immaterial to inquire whether the far-reaching sensation here be due to actual irradiation upon distant nerves or not. We are considering now, not the objective causes of the spatial feeling, but its subjective varieties, and the experiment shows that the same object gives more of it to the inner than to the outer cuticle of the ear. The pressure of the air in the tympanic cavity upon the membrane gives an astonishingly large sensation. We can increase the pressure by holding our nostrils and closing our mouth and forcing air through our Eustachian tubes by an expiratory effort; and we can diminish it by either inspiring or swallowing under the same conditions of closed mouth and nose. In either case we get a large round tridimensional sensation inside of the head, which seems as if it must come from the affection of an organ much larger than the tympanic membrane, whose surface hardly exceeds that of one's little-finger-nail.

The tympanic membrane is furthermore able to render sensible differences in the pressure of the external atmosphere, too slight to be felt either as noise or in this more violent way. If the reader will sit with closed eyes and let a friend approximate some solid object, like a large book, noiselessly to his face, he will immediately become aware of the object's presence and position—likewise of its departure. A friend of the writer, making the experiment for the first time, discriminated unhesitatingly between the three degrees of solidity of a board, a lattice-frame, and a sieve, held close to his ear. Now as this sensation is never used by ordinary persons as a means of perception, we may fairly assume that its felt quality, in those whose attention is called to it for the first time, belongs to it *quâ* sensation, and owes nothing to educational suggestions. But this felt quality is most distinctly and unmistakably one of vague spatial vastness in three dimensions—quite as much so as is the felt quality of the retinal sensation when we lie on our back and fill the entire field of vision with the empty blue sky. When an object is brought near the ear we immediately feel shut in, contracted; when the object is removed, we suddenly feel as if a

transparency, clearness, openness, had been made outside of us. And the feeling will, by any one who will take the pains to observe it, be acknowledged to involve the third dimension in a vague, unmeasured state.

[150]

The reader will have noticed, in this enumeration of facts, that *voluminousness of the feeling seems to bear very little relation to the size of the organ that yields it*. The ear and eye are comparatively minute organs, yet they give us feelings of great volume. The same lack of exact proportion between size of feeling and size of organ affected obtains within the limits of particular sensory organs. An object appears smaller on the lateral portions of the retina than it does on the fovea, as may be easily verified by holding the two forefingers parallel and a couple of inches apart, and transferring the gaze of one eye from one to the other. Then the finger not directly looked at will appear to shrink, and this whatever be the direction of the fingers. On the tongue a crumb, or the calibre of a small tube, appears larger than between the fingers. If two points kept equidistant (blunted compass- or scissors-points, for example) be drawn across the skin so as really to describe a pair of parallel lines, the lines will appear farther apart in some spots than in others. If, for example, we draw them horizontally across the face, so that the mouth falls between them, the person experimented upon will feel as if they began to diverge near the mouth and to include it in a well-marked ellipse. In like manner, if we keep the compass-points one or two centimetres apart, and draw them down the forearm over the wrist and palm, finally drawing one along one finger, the other along its neighbor, the appearance will be that of a single line, soon breaking into two, which become more widely separated below the wrist, to contract again in the palm, and finally diverge rapidly again towards the finger-tips. The dotted lines in Figs. 51 and 52 represent the true path of the compass-points; the full lines their apparent path.

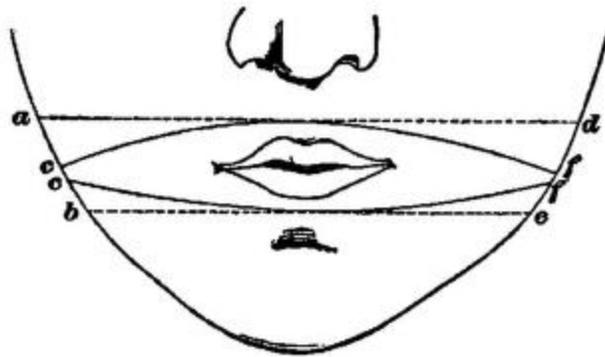


FIG. 51 (after Weber).

The same length of skin, moreover, will convey a more extensive sensation according to the manner of stimulation. If the edge of a card be pressed against the skin, the distance between its extremities will seem shorter than that between two compass-tips touching the same terminal points.^[151]

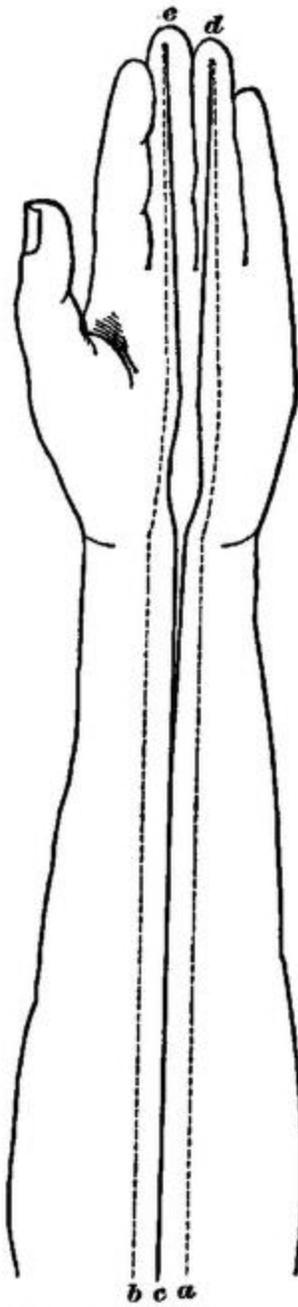


FIG. 52 (after Weber).

In the eye, intensity of nerve-stimulation seems to increase the *volume* of the feeling as well as its brilliancy. If we raise and lower the gas alternately, the whole room and all the objects in it seem alternately to enlarge and contract. If we cover half a page of small print with a gray glass, the print seen through the glass appears decidedly smaller than that seen outside of it, and the darker the glass the greater the difference. When a circumscribed

opacity in front of the retina keeps off part of the light from the portion which it covers, objects projected on that portion may seem but half as large as when their image falls outside of it.^[152] The inverse effect seems produced by certain drugs and anæsthetics. Morphine, atropine, daturine, and cold blunt the sensibility of the skin, so that distances upon it seem less. Haschish produces strange perversions of the general sensibility. Under its influence one's body may seem either enormously enlarged or strangely contracted. Sometimes a single member will alter its proportion to the rest; or one's back, for instance, will appear entirely absent, as if one were hollow behind. Objects comparatively near will recede to a vast distance, a short street assume to the eye an immeasurable perspective. Ether and chloroform occasionally produce not wholly dissimilar results. Panum, the German physiologist, relates that when, as a boy, he was etherized for neuralgia, the objects in the room grew extremely small and distant, before his field of vision darkened over and the roaring in his ears began. He also mentions that a friend of his in church, struggling in vain to keep awake, saw the preacher grow smaller and smaller and more and more distant. I myself on one occasion observed the same recession of objects during the beginning of chloroformization. In various cerebral diseases we find analogous disturbances.

Can we assign the physiological conditions which make the elementary sensible largeness of one sensation vary so much from that of another? Only imperfectly. One factor in the result undoubtedly is the number of nerve-terminations simultaneously excited by the outward agent that awakens the sensation. When many skin-nerves are warmed, or much retinal surface illuminated, our feeling is larger than when a lesser nervous surface is excited. The single sensation yielded by two compass-points, although it seems simple, is yet felt to be much bigger and blunter than that yielded by one. The touch of a single point may always be recognized by its quality of sharpness. This page looks much smaller to the reader if he closes one eye than if both eyes are open. So does the moon, which latter fact shows that the phenomenon has nothing to do with parallax. The celebrated boy couched for the cataract by Chesselden thought, after his first eye was operated, "all things he saw extremely large," but being couched of his second eye, said "that objects at first appeared large to this eye, but not so large as they did at first to the other; and looking upon the same object with

both eyes, he thought it looked about twice as large as with the first couched eye only, but not double, that we can anyways discover."

The greater extensiveness that the feeling of certain parts of the same surface has over other parts, and that one order of surface has over another (retina over skin, for example), may also to a certain extent be explained by the operation of the same factor. It is an anatomical fact that the most spatially sensitive surfaces (retina, tongue, finger-tips, etc.) are supplied by nerve-trunks of unusual thickness, which must supply to every unit of surface-area an unusually large number of terminal fibres. But the variations of felt extension obey probably only a very rough law of numerical proportion to the number of fibres. A sound is not twice as voluminous to two ears as to one; and the above-cited variations of feeling, when the same surface is excited under different conditions, show that the feeling is a resultant of several factors of which the anatomical one is only the principal. Many ingenious hypotheses have been brought forward to assign the co-operating factors where different conditions give conflicting amounts of felt space. Later we shall analyze some of these cases in detail, but it must be confessed here in advance that many of them resist analysis altogether.^[153]

THE PERCEPTION OF SPATIAL ORDER.

So far, all we have established or sought to establish is the existence of the vague form or *quale* of spatiality as an inseparable element bound up with the other peculiarities of each and every one of our sensations. The numerous examples we have adduced of the variations of this extensive element have only been meant to make clear its strictly sensational character. In very few of them will the reader have been able to explain the variation by an added intellectual element, such as the suggestion of a recollected experience. In almost all it has seemed to be the immediate psychic effect of a peculiar sort of nerve-process excited; and all the nerve-processes in question agree in yielding what space they do yield, to the mind, in the shape of a simple total vastness, in which, *primitively* at least, no *order of parts* or of *subdivisions* reigns.

Let no one be surprised at this notion of a space without order. There may be a space without order just as there may be an order without space.^[154]

And the primitive perceptions of space are certainly of an unordered kind. The order which the spaces first perceived potentially include must, before being distinctly apprehended by the mind, be woven into those spaces by a rather complicated set of intellectual acts. The primordial largenesses which the sensations yield must be *measured and subdivided* by consciousness, and *added* together, before they can form by their synthesis what we know as the real Space of the objective world. In these operations, imagination, association, attention, and selection play a decisive part; and although they nowhere add any new material to the space-data of sense, they so shuffle and manipulate these data and hide present ones behind imagined ones that it is no wonder if some authors have gone so far as to think that the sense-data have no spatial worth at all, and that the intellect, since it makes the subdivisions, also gives the spatial quality to them out of resources of its own.

As for ourselves, having found that all our sensations (however as yet unconnected and undiscriminated) are of extensive objects, *our next problem, is: How do we ARRANGE these at first chaotically given spaces into the one regular and orderly 'world of space' which we now know?*

To begin with, there is no reason to suppose that the several sense-spaces of which a sentient creature may become conscious, each filled with its own peculiar content, should tend, simply *because they are many*, to enter into any definite spatial intercourse with each other, or lie in any particular order of positions. Even in ourselves we can recognize this. Different feelings may coexist in us without assuming any particular spatial order. The sound of the brook near which I write, the odor of the cedars, the comfort with which my breakfast has filled me, and my interest in this paragraph, all lie distinct in my consciousness, but in no sense outside or alongside of each other. Their spaces are interfused and at most fill the same vaguely objective world. Even where the qualities are far less disparate, we may have something similar. If we take our subjective and corporeal sensations alone, there are moments when, as we lie or sit motionless, we find it very difficult to feel distinctly the length of our back or the direction of our feet from our shoulders. By a strong effort we can succeed in dispersing our

attention impartially over our whole person, and then we feel the real shape of our body in a sort of unitary way. But in general a few parts are strongly emphasized to consciousness and the rest sink out of notice; and it is then remarkable how vague and ambiguous our perception of their relative order of location is. Obviously, for the orderly arrangement of a multitude of sense-spaces in consciousness, something more than their mere separate existence is required. What is this further condition?

If a number of sensible extents are to be perceived alongside of each other and in definite order they must appear as parts in a vaster sensible extent which can enter the mind simply and all at once. I think it will be seen that the difficulty of estimating correctly the form of one's body by pure feeling arises from the fact that it is very hard to feel its totality as a unit at all. The trouble is similar to that of thinking forwards and backwards simultaneously. When conscious of our head we tend to grow unconscious of our feet, and there enters thus an element of time-succession into our perception of ourselves which transforms the latter from an act of intuition to one of construction. This element of constructiveness is present in a still higher degree, and carries with it the same consequences, when we deal with objective spaces too great to be grasped by a single look. The relative positions of the shops in a town, separated by many tortuous streets, have to be thus constructed from data apprehended in succession, and the result is a greater or less degree of vagueness.

That a sensation *be discriminated as a part* from out of a larger enveloping space is then the *conditio sine quâ non* of its being apprehended in a definite spatial order. The problem of ordering our feelings in space is then, in the first instance, a problem of discrimination, but not of discrimination pure and simple; for then not only coexistent sights but coexistent sounds would necessarily assume such order, which they notoriously do not. Whatever is discriminated will appear as a small space within a larger space, it is true, but this is but the very rudiment of order. For the location of it within that space to become precise, other conditions still must supervene; and the best way to study what they are will be to pause for a little and *analyze what the expression 'spatial order' means.*

Spatial order is an abstract term. The concrete perceptions which it covers are figures, directions, positions, magnitudes, and distances. To single out any one of these things from a total vastness is partially to introduce order into the vastness. To subdivide the vastness into a multitude of these things is to apprehend it in a completely orderly way. Now what are these things severally? To begin with, no one can for an instant hesitate to say that some of them are qualities of sensation, just as the total vastness is in which they lie. Take figure: a square, a circle, and a triangle appear in the first instance to the eye simply as three different kinds of impressions, each so peculiar that we should recognize it if it were to return. When Nunnely's patient had his cataracts removed, and a cube and a sphere were presented to his notice, he could at once perceive a difference in their shapes; and though he could not say which was the cube and which the sphere, he saw they were not of the same figure. So of lines: if we can notice lines at all in our field of vision, it is inconceivable that a vertical one should not affect us differently from an horizontal one, and should not be recognized as affecting us similarly when presented again, although we might not yet know the name 'vertical,' or any of its connotations, beyond this peculiar affection of our sensibility. So of angles: an obtuse one affects our feeling immediately in a different way from an acute one. Distance-apart, too, is a simple sensation—the sensation of a line joining the two distant points: lengthen the line, you alter the feeling and with it the distance felt.

Space-relations.

But with distance and direction we pass to the category of *space-relations*, and are immediately confronted by an opinion which makes of all relations something *toto cælo* different from all facts of feeling or imagination whatsoever. A relation, for the Platonizing school in psychology, is an energy of pure thought, and, as such, is quite incommensurable with the data of sensibility between which it may be perceived to obtain.

We may consequently imagine a disciple of this school to say to us at this point: "Suppose you *have* made a separate specific sensation of each line and each angle, what boots it? You have still the order of directions and of distances to account for; you have still the relative magnitudes of all these felt figures to state; you have their respective positions to define before you

can be said to have brought order into your space. And not one of these determinations can be effected except through an act of relating thought, so that your attempt to give an account of space in terms of pure sensibility breaks down almost at the very outset. *Position*, for example, can never be a sensation, for it has nothing intrinsic about it; it can only obtain *between* a spot, line, or other figure and *extraneous co-ordinates*, and can never be an element of the sensible datum, the line or the spot, in itself. Let us then confess that Thought alone can unlock the riddle of space, and that Thought is an adorable but unfathomable mystery."

Such a method of dealing with the problem has the merit of shortness. Let us, however, be in no such hurry, but see whether we cannot get a little deeper by patiently considering what these space-relations are.

'Relation' is a very slippery word. It has so many different concrete meanings that the use of it as an abstract universal may easily introduce bewilderment into our thought. We must therefore be careful to avoid ambiguity by making sure, wherever we have to employ it, what its precise meaning is in that particular sphere of application. At present we have to do with space-relations, and no others. Most 'relations' are feelings of an entirely different order from the terms they relate. The relation of similarity, e.g., may equally obtain between jasmine and tuberose, or between Mr. Browning's verses and Mr. Story's; it is itself neither odorous nor poetical, and those may well be pardoned who have denied to it all sensational content whatever. But just as, in the field of quantity, the relation between two numbers is another number, so *in the field of space the relations are facts of the same order with the facts they relate. If these latter be patches in the circle of vision, the former are certain other patches between them.* When we speak of the relation of direction of two points toward each other, we mean simply the sensation of the line that joins the two points together. *The line is the relation;* feel it and you feel the relation, see it and you see the relation; nor can you in any conceivable way think the latter except by imagining the former (however vaguely), or describe or indicate the one except by pointing to the other. And the moment you have imagined the line, the relation stands before you in all its completeness, with nothing further to be done. Just so the relation of *direction* between two lines is identical with the peculiar sensation of shape of the space enclosed between them. This is commonly called an angular relation.

If these relations are sensations, no less so are the relations of position. *The relation of position between the top and bottom points of a vertical line is that line*, and nothing else. The relations of position between a point and a horizontal line below it are potentially numerous. There is one more important than the rest, called its distance. This is the sensation, ideal or actual, of a perpendicular drawn from the point to the line.^[155] Two lines, one from each extremity of the horizontal to the point, give us a peculiar sensation of triangularity. This feeling may be said to constitute the *locus* of all the relations of position of the elements in question. *Rightness and leftness, upness and downness, are again pure sensations* differing specifically from each other, and generically from everything else. Like all sensations, they can only be indicated, not described. If we take a cube and label one side *top*, another *bottom*, a third *front*, and a fourth *back*, there remains no form of words by which we can describe to another person which of the remaining sides is *right* and which *left*. We can only point and say *here* is right and *there* is left, just as we should say *this* is red and *that* blue. Of two points seen beside each other at all, one is always affected by one of these feelings, and the other by the opposite; the same is true of the extremities of any line.^[156]

Thus it appears indubitable that all space-relations except those of magnitude are nothing more or less than pure sensational objects. But *magnitude* appears to outstep this narrow sphere. We have relations of muchness and littleness between times, numbers, intensities, and qualities, as well as spaces. It is impossible, then, that such relations should form a particular kind of simply spatial feeling. This we must admit: the relation of quantity is generic and occurs in many categories of consciousness, whilst the other relations we have considered are specific and occur in space alone. When our attention passes from a shorter line to a longer, from a smaller spot to a larger, from a feebler light to a stronger, from a paler blue to a richer, from a march tune to a galop, the transition is accompanied in the synthetic field of consciousness by a peculiar feeling of difference which is what we call the sensation of *more*,—more length, more expanse, more light, more blue, more motion. This transitional sensation of *more* must be identical with itself under all these different accompaniments, or we should not give it the same name in every case. We get it when we pass from a short vertical line to a long horizontal one, from a small square to a large

circle, as well as when we pass between those figures whose shapes are congruous. But when the shapes are congruous our consciousness of the relation is a good deal more distinct, and it is most distinct of all when, in the exercise of our analytic attention, we notice, first, a *part*, and then the *whole*, of a *single* line or shape. Then the *more* of the whole actually sticks out, as a separate piece of space, and is so envisaged. The same exact sensation of it is given when we are able to superpose one line or figure on another. This indispensable condition of exact measurement of the *more* has led some to think that the feeling itself arose in every case from original experiences of superposition. This is probably not an absolutely true opinion, but for our present purpose that is immaterial. So far as the subdivisions of a sense-space are to be *measured* exactly against each other, objective forms occupying one subdivision must directly or indirectly be superposed upon the other, and the mind must get the immediate feeling of an outstanding *plus*. And even where we only feel one subdivision to be vaguely larger or less, the mind must pass rapidly between it and the other subdivision, and receive the immediate sensible shock of the *more*.

We seem thus to have accounted for all space-relations, and made them clear to our understanding. They are nothing but sensations of particular lines, particular angles, particular forms of transition, or (in the case of a distinct more) of particular outstanding portions of space after two figures have been superposed. These relation-sensations may actually be produced as such, as when a geometer draws new lines across a figure with his pencil to demonstrate the relations of its parts, or they may be ideal representations of lines, not really drawn. But in either case their entrance into the mind is equivalent to a more detailed subdivision, cognizance, and measurement of the space considered. The bringing of subdivisions to consciousness constitutes, then, the entire process by which we pass from our first vague feeling of a total vastness to a cognition of the vastness in detail. The more numerous the subdivisions are, the more elaborate and perfect the cognition becomes. But inasmuch as all the subdivisions are themselves sensations, and even the feeling of 'more' or 'less' is, where not itself a figure, at least a sensation of transition between two sensations of figure, it follows, for

aught we can as yet see to the contrary, that *all spatial knowledge is sensational at bottom*, and that, as the sensations lie together in the unity of consciousness, no new material element whatever comes to them from a supra-sensible source.^[157]

The bringing of subdivisions to consciousness! This, then, is our next topic. They may be brought to consciousness under three aspects in respect of their *locality*, in respect of their *size*, in respect of their *shape*.

The Meaning of Localization.

Confining ourselves to the problem of locality for the present, let us begin with the simple case of a sensitive surface, only two points of which receive stimulation from without. How, first, are these two points felt as alongside of each other with an interval of space between them? We must be conscious of two things for this: of the duality of the excited points, and of the extensiveness of the unexcited interval. The duality alone, although a necessary, is not a sufficient condition of the spatial separation. We may, for instance, discern two sounds in the same place, sweet and sour in the same lemonade, warm and cold, round and pointed contact in the same place on the skin, etc.^[158] In all discrimination the recognition of the duality of two feelings by the mind is the easier the more strongly the feelings are contrasted in quality. If our two excited points awaken identical qualities of sensation, they must, perforce, appear to the mind as one; and, not distinguished at all, they are, *a fortiori*, not localized apart. Spots four centimetres distant on the back have no qualitative contrast at all, and fuse into a single sensation. Points less than three thousandths of a millimetre apart awaken on the retina sensations so contrasted that we apprehend them immediately as two. Now these unlikenesses which arise so slowly when we pass from one point to another in the back, so much faster on the tongue and finger-tips, but with such inconceivable rapidity on the retina, what are they? Can we discover anything about their intrinsic nature?

The most natural and immediate answer to make is that they are unlikeness of *place* pure and simple. In the words of a German physiologist,^[159] to whom psychophysics owes much:

"The sensations are from the outset (*von vornherein*) localized.... Every sensation as such is from the very beginning affected with the spatial quality, so that this quality is nothing like an external attribute coming to the sensation from a higher faculty, but must be regarded as something immanently residing in the sensation itself."

And yet the moment we reflect on this answer an insuperable logical difficulty seems to present itself. No single *quale* of sensation can, by itself, amount to a consciousness of *position*. Suppose no feeling but that of a single point ever to be awakened. Could that possibly be the feeling of any special *whereness* or *thereness*? Certainly not. *Only when a second point is felt to arise can the first one acquire a determination of up, down, right or left, and these determinations are all relative to that second point.* Each point, so far as it is *placed*, is then only by virtue of what it *is not*, namely, by virtue of another point. This is as much as to say that position has nothing *intrinsic* about it; and that, although a feeling of absolute bigness may, *a feeling of place cannot, possibly form an immanent element in any single isolated sensation.* The very writer we have quoted has given heed to this objection, for he continues (p. 335) by saying that the sensations thus originally localized "are only so *in themselves*, but not in the representation of consciousness, which is not yet present.... They are, in the first instance, devoid of all mutual relations with each other." But such a localization of the sensation 'in itself' would seem to mean nothing more than the susceptibility or *potentiality* of being distinctly localized when the time came and other conditions became fulfilled. Can we now discover anything about such susceptibility in itself before it has borne its ulterior fruits in the developed consciousness?

'Local Signs.'

To begin with, every sensation of the skin and every visceral sensation seems to derive from its topographic seat a peculiar shade of feeling, which it would not have in another place. And this feeling *per se* seems quite another thing from the perception of the place. Says Wundt^[160]:

"If with the finger we touch first the cheek and then the palm, exerting each time precisely the same pressure, the sensation shows

notwithstanding a distinctly marked difference in the two cases. Similarly, when we compare the palm with the back of the hand, the nape of the neck with its anterior surface, the breast with the back; in short, any two distant parts of the skin with each other. And moreover, we easily remark, by attentively observing, that spots even tolerably close together differ in respect of the quality of their feeling. If we pass from one point of our cutaneous surface to another, we find a perfectly gradual and continuous alteration in our feeling, notwithstanding the objective nature of the contact has remained the same. Even the sensations of corresponding points on opposite sides of the body, though similar, are not identical. If, for instance, we touch first the back of one hand and then of the other, we remark a qualitative unlikeness of sensation. It must not be thought that such differences are mere matters of imagination, and that we take the sensations to be different because we represent each of them to ourselves as occupying a different place. With sufficient sharpening of the attention, we may, confining ourselves to the quality of the feelings alone, entirely abstract from their locality, and yet notice the differences quite as markedly."

Whether these local contrasts shade into each other with absolutely continuous gradations, we cannot say. But we know (continues Wundt) that

"they change, when we pass from one point of the skin to its neighbor, with very different degrees of rapidity. On delicately-feeling parts, used principally for touching, such as the finger-tips, the difference of sensation between two closely approximate points is already strongly pronounced; whilst in parts of lesser delicacy, as the arm, the back, the legs, the disparities of sensation are observable only between distant spots."

The internal organs, too, have their specific *qualia* of sensation. An inflammation of the kidney is different from one of the liver; pains in joints and muscular insertions are distinguished. Pain in the dental nerves is wholly unlike the pain of a burn. But very important and curious similarities prevail throughout these differences. Internal pains, whose seat we cannot see, and have no means of knowing unless the character of the pain itself

reveal it, are felt *where* they belong. Diseases of the stomach, kidney, liver, rectum, prostate, etc., of the bones, of the brain and its membranes, are referred to their proper position. Nerve-pains describe the length of the nerve. Such localizations as those of vertical, frontal, or occipital headache of intracranial origin force us to conclude that parts which are neighbors, whether inner or outer, may possess by mere virtue of that fact a common peculiarity of feeling, a respect in which their sensations agree, and which serves as a token of their proximity. These *local* colorings are, moreover, so strong that we cognize them as the same, throughout all contrasts of sensible quality in the accompanying perception. Cold and heat are wide as the poles asunder; yet if both fall on the cheek, there mixes with them something that makes them in *that respect* identical; just as, contrariwise, despite the identity of cold with itself wherever found, when we get it first on the palm and then on the cheek, some difference comes, which keeps the two experiences for ever asunder.^[161]

And now let us revert to the query propounded a moment since: *Can these differences of mere quality in feeling, varying according to locality yet having each sensibly and intrinsically and by itself nothing to do with position, constitute the 'susceptibilities' we mentioned, the conditions of being perceived in position, of the localities to which they belong?* The numbers on a row of houses, the initial letters of a set of words, have no intrinsic kinship with points of space, and yet they are the conditions of our knowledge of where any house is in the row, or any word in the dictionary. Can the modifications of feeling in question be tags or labels of this kind which in no wise originally reveal the position of the spot to which they are attached, but guide us to it by what Berkeley would call a 'customary tie'? Many authors have unhesitatingly replied in the affirmative; Lotze, who in his *Medizinische Psychologie*^[162] first described the sensations in this way, designating them, thus conceived, as *local-signs*. This term has obtained wide currency in Germany, and *in speaking of the 'LOCAL-SIGN THEORY' hereafter, I shall always mean the theory which denies that there can be in a sensation any element of actual locality, of inherent spatial order, any tone as it were which cries to us immediately and without further ado, 'I am here,' or 'I am there.'*

If, as may well be the case, we by this time find ourselves tempted to accept the Local-sign theory in a general way, we have to clear up several farther

matters. If a sign is to lead us to *the thing* it means, we must have some other source of knowledge of that thing. Either the thing has been given in a previous experience of which the sign also formed part—they are *associated*; or it is what Reid calls a 'natural' sign, that is, a feeling which, the first time it enters the mind, evokes from the native powers thereof a cognition of the thing that hitherto had lain dormant. In both cases, however, the sign is one thing, and the thing another. In the instance that now concerns us, *the sign is a quality of feeling and the thing is a position*. Now we have seen that the position of a point is not only revealed, but created, by the existence of other points to which it stands in determinate relations. *If the sign can by any machinery which it sets in motion evoke a consciousness either of the other points, or of the relations, or of both, it would seem to fulfil its function, and reveal to us the position we seek.*

But such a machinery is already familiar to us. It is neither more nor less than the law of habit in the nervous system. When any point of the sensitive surface has been frequently excited simultaneously with, or immediately before or after, other points, and afterwards comes to be excited alone, there will be a tendency for its perceptive nerve-centre to irradiate into the nerve-centres of the other points. Subjectively considered, this is the same as if we said that *the peculiar feeling of the first point SUGGESTS the feeling of the entire region with whose stimulation its own excitement has been habitually ASSOCIATED.*

Take the case of the stomach. When the epigastrium is heavily pressed, when certain muscles contract, etc., the stomach is squeezed, and its peculiar local sign awakes in consciousness simultaneously with the local signs of the other squeezed parts. There is also a sensation of total vastness aroused by the combined irritation, and *somewhere* in this the stomach-feeling seems to lie. Suppose that later a pain arises in the stomach from some non-mechanical cause. It will be tinged by the gastric local sign, and the nerve-centre supporting this latter feeling will excite the centre supporting the dermal and muscular feelings habitually associated with it when the excitement was mechanical. From the combination the same peculiar vastness will again arise. In a word, 'something' in the stomach-sensation 'reminds' us of a total space, of which the diaphragmatic and epigastric sensations also form a part, or, to express it more briefly still, suggests the neighborhood of these latter organs.^[163]

Revert to the case of two excited points on a surface with an unexcited space between them. The general result of previous experience has been that when either point was impressed by an outward object, the same object also touched the immediately neighboring parts. Each point, together with its local sign, is thus associated with a circle of surrounding points, the association fading in strength as the circle grows larger. Each will revive its own circle; but when both are excited together, the strongest revival will be that due to the *combined* irradiation. Now the tract *joining the two excited points* is the only part common to the two circles. And the feelings of this whole tract will therefore awaken with considerable vividness in the imagination when its extremities are touched by an outward irritant. The mind receives with the impression of the two distinct points the vague idea of a line. The twoness of the points comes from the contrast of their local signs: the line comes from the associations into which experience has wrought these latter. If no ideal line arises we have duality without sense of interval; if the line be excited actually rather than ideally, we have the interval given with its ends, in the form of a single extended object felt. E. H. Weber, in the famous article in which he laid the foundations of all our accurate knowledge of these subjects, *laid it down as the logical requisite for the perception of two separated points, that the mind should, along with its consciousness of them, become aware of an unexcited interval as such. I have only tried to show how the known laws of experience may cause this requisite to be fulfilled.* Of course, if the local signs of the entire region offer but little qualitative contrast *inter se*, the line suggested will be but dimly defined or discriminated in length or direction from other possible lines in its neighborhood. This is what happens in the back, where consciousness can sunder two spots, whilst only vaguely apprehending their distance and direction apart.

The relation of position of the two points *is* the suggested interval or line. Turn now to the simplest case, that of *a single excited spot. How can it suggest its position?* Not by recalling any particular line unless experience have constantly been in the habit of marking or tracing some one line from it towards some one neighboring point. Now on the back, belly, viscera, etc., no such tracing habitually occurs. The consequence is that the only suggestion is that of the whole neighboring circle; i.e., *the spot simply recalls the general region in which it happens to lie.* By a process of successive construction, it is quite true that we can also get the feeling of

distance between the spot and some other particular spot. Attention, by reinforcing the local sign of one part of the circle, can awaken a new circle round this part, and so *de proche en proche* we may slide our feeling down from our cheek, say, to our foot. But when we first touched our cheek we had no consciousness of the foot at all.^[164] In the extremities, the lips, the tongue and other mobile parts, the case is different. We there have an instinctive tendency, when a part of lesser discriminative sensibility is touched, to move the member so that the touching object glides along it to the place where sensibility is greatest. If a body touches our hand we move the hand over it till the finger-tips are able to explore it. If the sole of our foot touches anything we bring it towards the toes, and so forth. There thus arise lines of habitual passage from all points of a member to its sensitive tip. These are the lines most readily recalled when any point is touched, and their recall is identical with the consciousness of the distance of the touched point from the 'tip.' I think anyone must be aware when he touches a point of his hand or wrist that it is the relation to the finger-tips of which he is usually most conscious. Points on the forearm suggest either the finger-tips or the elbow (the latter being a spot of greater sensibility^[165]). In the foot it is the toes, and so on. A point can only be cognized in its relations to the entire body at once by awakening a *visual* image of the whole body. Such awakening is even more obviously than the previously considered cases a matter of pure association.

This leads us to the eye. On the retina the fovea and the yellow spot about it form a focus of exquisite sensibility, towards which every impression falling on an outlying portion of the field is moved by an instinctive action of the muscles of the eyeball. Few persons, until their attention is called to the fact, are aware how almost impossible it is to keep a conspicuous visible object in the margin of the field of view. The moment volition is relaxed we find that without our knowing it our eyes have turned so as to bring it to the centre. This is why most persons are unable to keep the eyes steadily converged upon a point in space with nothing in it. The objects against the walls of the room invincibly attract the foveæ to themselves. If we contemplate a blank wall or sheet of paper, we always observe in a moment

that we are directly looking at some speck upon it which, unnoticed at first, ended by 'catching our eye.' Thus *whenever an image falling on the point P of the retina excites attention, it more habitually moves from that point towards the fovea than in any one other direction.* The line traced thus by the image is not always a straight line. When the direction of the point from the fovea is neither vertical nor horizontal but oblique, the line traced is often a curve, with its concavity directed upwards if the direction is upwards, downwards if the direction is downwards. This may be verified by anyone who will take the trouble to make a simple experiment with a luminous body like a candle-flame in a dark enclosure, or a star. Gazing first at some point remote from the source of light, let the eye be suddenly turned full upon the latter. The luminous image will necessarily fall in succession upon a continuous series of points, reaching from the one first affected to the fovea. But by virtue of the slowness with which retinal excitements die away, the entire series of points will for an instant be visible as an after-image, displaying the above peculiarity of form according to its situation.^[166] These radiating lines are neither regular nor invariable in the same person, nor, probably, equally curved in different individuals. We are incessantly drawing them between the fovea and every point of the field of view. Objects remain in their peripheral indistinctness only so long as they are unnoticed. The moment we attend to them they grow distinct through one of these motions—which leads to the idea prevalent among uninstructed persons that we see distinctly all parts of the field of view at once. *The result of this incessant tracing of radii is that whenever a local sign P is awakened by a spot of light falling upon it, it recalls forthwith, even though the eyeball be unmoved, the local signs of all the other points which lie between P and the fovea.* It recalls them in imaginary form, just as the normal reflex movement would recall them in vivid form; and with their recall is given a consciousness more or less faint of the whole line on which they lie. In other words, no ray of light can fall on any retinal spot without the local sign of that spot revealing to us, by recalling the line of its most habitual associates, its direction and distance from the centre of the field. The fovea acts thus as the origin of a system of polar co-ordinates, in relation to which each and every retinal point has through an incessantly-repeated process of association its distance and direction determined. Were P alone illumined and all the rest of the field dark we should still, even with motionless eyes, know whether P lay high or

low, right or left, through the *ideal streak*, different from all other streaks, which *P* alone has the power of awakening.^[167]

And with this we can close the first great division of our subject. We have shown that, within the range of every sense, experience takes *ab initio* the spatial form. We have also shown that in the cases of the retina and skin every sensible total may be subdivided by discriminative attention into sensible parts, which are also spaces, and into relations between the parts, these being sensible spaces too. Furthermore, we have seen (in [note 167](#)) that different parts, once discriminated, necessarily fall into a determinate order, both by reason of definite gradations in their quality, and by reason of the fixed order of time-succession in which movements arouse them. But in all this nothing has been said of the comparative *measurement* of one sensible space-total against another, or of the way in which, by summing our divers simple sensible space-experiences together, we end by constructing what we regard as the unitary, continuous, and infinite objective Space of the real world. To this more difficult inquiry we next pass.

THE CONSTRUCTION OF 'REAL' SPACE.

The problem breaks into two subordinate problems.

(1) *How is the subdivision and measurement of the several sensorial spaces completely effected?* and

(2) *How do their mutual addition and fusion and reduction to the same scale, in a word, how does their synthesis, occur?*

I think that, as in the investigation just finished, we found ourselves able to get along without invoking any data but those that pure sensibility on the one hand, and the ordinary intellectual powers of discrimination and recollection on the other, were able to yield; so here we shall emerge from our more complicated quest with the conviction that all the facts can be accounted for on the supposition that no other mental forces have been at work save those we find everywhere else in psychology: sensibility, namely, for the data; and discrimination, association, memory, and choice for the rearrangements and combinations which they undergo.

1. *The Subdivision of the Original Sense-spaces.*

How are spatial subdivisions brought to consciousness? in other words, How does spatial discrimination occur? The general subject of discrimination has been treated in a previous chapter. Here we need only inquire what are the conditions that make spatial discrimination so much finer in sight than in touch, and in touch than in hearing, smell, or taste.

The first great condition is, that different points of the surface shall differ in the quality of their immanent sensibility, that is, that each shall carry its special local-sign. If the skin felt everywhere exactly alike, a foot-bath could be distinguished from a total immersion, as being smaller, but never distinguished from a wet face. The local-signs are indispensable; two points which have the same local-sign will always be felt as the same point. We do not judge them two unless we have discerned their sensations to be different.^[168] Granted none but homogeneous irritants, that organ would then distinguish the greatest multiplicity of irritants—would count most stars or compass-points, or best compare the size of two wet surfaces—whose local sensibility was the least even. A skin whose sensibility shaded rapidly off from a focus, like the apex of a boil, would be better than a homogeneous integument for spatial perception. The retina, with its exquisitely sensitive fovea, has this peculiarity, and undoubtedly owes to it a great part of the minuteness with which we are able to subdivide the total bigness of the sensation it yields. On its periphery the local differences do not shade off very rapidly, and we can count there fewer subdivisions.

But these local differences of feeling, so long as the surface is unexcited from without, are almost null. I cannot feel them by a pure mental act of attention unless they belong to quite distinct parts of the body, as the nose and the lip, the finger-tip and the ear; their contrast needs the reinforcement of outward excitement to be felt. In the spatial muchness of a colic—or, to call it by the more spacious-sounding vernacular, of a 'bellyache'—one can with difficulty distinguish the north-east from the south-west corner, but can do so much more easily if, by pressing one's finger against the former region, one is able to make the pain there more intense.

The local differences require then an adventitious sensation, superinduced upon them, to awaken the attention. After the attention has once been

awakened in this way, it may continue to be conscious of the unaided difference; just as a sail on the horizon may be too faint for us to notice until someone's finger, placed against the spot, has pointed it out to us, but may then remain visible after the finger has been withdrawn. But all this is true only on condition that separate points of the surface may be *exclusively* stimulated. If the whole surface at once be excited from without, and homogeneously, as, for example, by immersing the body in salt water, local discrimination is not furthered. The local-signs, it is true, all awaken at once; but in such multitude that no one of them, with its specific quality, stands out in contrast with the rest. If, however, a single extremity be immersed, the contrast between the wet and dry parts is strong, and, at the surface of the water especially, the local-signs attract the attention, giving the feeling of a ring surrounding the member. Similarly, two or three wet spots separated by dry spots, or two or three hard points against the skin, will help to break up our consciousness of the latter's bigness. In cases of this sort, where points receiving an identical kind of excitement are, nevertheless, felt to be locally distinct, and the objective irritants are also judged multiple,—e.g., compass-points on skin or stars on retina,—the ordinary explanation is no doubt just, and we judge the outward causes to be multiple because we have discerned the local feelings of their sensations to be different.

Capacity for partial stimulation is thus the second condition favoring discrimination. A sensitive surface which has to be excited in all its parts at once can yield nothing but a sense of undivided largeness. This appears to be the case with the olfactory, and to all intents and purposes with the gustatory, surfaces. Of many tastes and flavors, even simultaneously presented, each affects the totality of its respective organ, each appears with the whole vastness given by that organ, and appears interpenetrated by the rest.^[169]

I should have been willing some years ago to name without hesitation a third condition of discrimination—saying it would be most developed in that organ which is susceptible of the *most various qualities* of feeling. The retina is unquestionably such an organ. The colors and shades it perceives are infinitely more numerous than the diversities of skin-sensation. And it can feel at once white and black, whilst the ear can in nowise so feel sound and silence. But the late researches of Donaldson, Blix, and Goldscheider,

[170] on specific points for heat, cold, pressure, and pain in the skin; the older ones of Czermak (repeated later by Klug in Ludwig's laboratory), showing that a hot and a cold compass-point are no more easily discriminated as two than two of equal temperature; and some unpublished experiments of my own—all disincite me to make much of this condition now.^[171] There is, however, one quality of sensation which is particularly exciting, and that is the *feeling of motion over any of our surfaces*. The erection of this into a separate elementary quality of sensibility is one of the most recent of psychological achievements, and is worthy of detaining us a while at this point.

The Sensation of Motion over Surfaces.

The feeling of motion has generally been assumed by physiologists to be impossible until the positions of *terminus a quo* and *terminus ad quem* are severally cognized, and the successive occupancies of these positions by the moving body are perceived to be separated by a distinct interval of time.^[172] As a matter of fact, however, we cognize only the very slowest motions in this way. Seeing the hand of a clock at XII and afterwards at VI, we judge that it has moved through the interval. Seeing the sun now in the east and again in the west, I infer it to have passed over my head. But we can only *infer* that which we already generically know in some more direct fashion, and it is experimentally certain that we have the feeling of motion given us as a direct and simple *sensation*. Czermak long ago pointed out the difference between seeing the motion of the second-hand of a watch, when we look directly at it, and noticing the fact of its having altered its position when we fix our gaze upon some other point of the dial-plate. In the first case we have a specific quality of sensation which is absent in the second. If the reader will find a portion of his skin—the arm, for example—where a pair of compass-points an inch apart are felt as one impression, and if he will then trace lines a tenth of an inch long on that spot with a pencil-point, he will be distinctly aware of the point's motion and vaguely aware of the direction of the motion. The perception of the motion here is certainly not derived from a pre-existing knowledge that its starting and ending points are separate positions in space, because positions in space ten times wider apart fail to be discriminated as such when excited by the dividers. It is the

same with the retina. One's fingers when cast upon its peripheral portions cannot be counted—that is to say, the five retinal tracts which they occupy are not distinctly apprehended by the mind as five separate positions in space—and yet the slightest *movement* of the fingers is most vividly perceived as movement and nothing else. It is thus certain that our sense of movement, being so much more delicate than our sense of position, cannot possibly be derived from it. *A curious observation by Exner*^[173] completes the proof that movement is a primitive form of sensibility, by showing it to be much more delicate than our sense of succession in time. This very able physiologist caused two electric sparks to appear in rapid succession, one beside the other. The observer had to state whether the right-hand one or the left-hand one appeared first. When the interval was reduced to as short a time as 0.044" the discrimination of temporal order in the sparks became impossible. But Exner found that if the sparks were brought so close together in space that their irradiation-circles overlapped, the eye then felt their flashing as if it were the motion of a single spark from the point occupied by the first to the point occupied by the second, and the time-interval might then be made as small as 0.015" before the mind began to be in doubt as to whether the apparent motion started from the right or from the left. On the skin similar experiments gave similar results.

Vierordt, at almost the same time,^[174] *called attention to certain persistent illusions, amongst which are these:* If another person gently trace a line across our wrist or finger, the latter being stationary, it will feel to us as if the member were moving in the opposite direction to the tracing point. If, on the contrary, we move our limb across a fixed point, it will be seen as if the point were moving as well. If the reader will touch his forehead with his forefinger kept motionless, and then rotate the head so that the skin of the forehead passes beneath the finger's tip, he will have an irresistible sensation of the latter being itself in motion in the opposite direction to the head. So in abducting the fingers from each other; some may move and the rest be still still, but the still ones will feel as if they were actively separating from the rest. These illusions, according to Vierordt, are survivals of a primitive form of perception, when motion was felt as such, but ascribed to the whole content of consciousness, and not yet distinguished as belonging exclusively to one of its parts. When our perception is fully developed we go beyond the mere relative motion of

thing and ground, and can ascribe absolute motion to one of these components of our total object, and absolute rest to another. When, in vision for example, the whole background moves together, we think that it is ourselves or our eyes which are moving; and any object in the foreground which may move relatively to the background is judged by us to be still. But primitively this discrimination cannot be perfectly made. The sensation of the motion spreads over all that we see and infects it. Any relative motion of object and retina both makes the object seem to move, and makes us feel ourselves in motion. Even now when our whole object moves we still get giddy; and we still see an apparent motion of the entire field of view, whenever we suddenly jerk our head and eyes or shake them quickly to and fro. Pushing our eyeballs gives the same illusion. We *know* in all these cases what really happens, but the conditions are unusual, so our primitive sensation persists unchecked. So it does when clouds float by the moon. We *know* the moon is still; but we *see* it move even faster than the clouds. Even when we slowly move our eyes the primitive sensation persists under the victorious conception. If we notice closely the experience, we find that any object towards which we look appears moving to meet our eye.

But the most valuable contribution to the subject is the paper of G. H. Schneider,^[175] who takes up the matter zoologically, and shows by examples from every branch of the animal kingdom that movement is the quality by which animals most easily attract each other's attention. The instinct of 'shamming death' is no shamming of death at all, but rather a paralysis through fear, which saves the insect, crustacean, or other creature from being *noticed at all* by his enemy. It is paralleled in the human race by the breath-holding stillness of the boy playing 'I spy,' to whom the seeker is near; and its obverse side is shown in our involuntary waving of arms, jumping up and down, and so forth, when we wish to attract someone's attention at a distance. Creatures 'stalking' their prey and creatures hiding from their pursuers alike show how immobility diminishes conspicuity. In the woods, if we are quiet, the squirrels and birds will actually touch us. Flies will light on stuffed birds and stationary frogs.^[176] On the other hand, the tremendous shock of feeling the thing we are sitting on begin to move, the exaggerated start it gives us to have an insect unexpectedly pass over our skin, or a cat noiselessly come and snuffle about our hand, the excessive

reflex effects of tickling, etc., show how exciting the sensation of motion is *per se*. A kitten cannot help pursuing a moving ball. Impressions too faint to be cognized at all are immediately felt if they move. A fly sitting is unnoticed,—we feel it the moment it crawls. A shadow may be too faint to be perceived. As soon as it moves, however, we see it. Schneider found that a shadow, with distinct outline, and directly fixated, could still be perceived when moving, although its objective strength might be but half as great as that of a stationary shadow so faint as just to disappear. With a blurred shadow in indirect vision the difference in favor of motion was much greater—namely, 13.3:40.7. If we hold a finger between our closed eyelid and the sunshine we shall not notice its presence. The moment we move it to and fro, however, we discern it. Such visual perception as this reproduces the conditions of sight among the radiates.^[177]

Enough has now been said to show that *in the education of spatial discrimination the motions of impressions across sensory surfaces must have been the principal agent* in breaking up our consciousness of the surfaces into a consciousness of their parts. Even to-day the main function of the peripheral regions of our retina is that of sentinels, which, when beams of light move over them, cry 'Who goes there?' and call the fovea to the spot. Most parts of the skin do but perform the same office for the finger-tips. Of course finger-tips and fovea leave *some* power of direct perception to marginal retina and skin respectively. But it is worthy of note that such perception is best developed on the skin of the most movable parts (the labors of Vierordt and his pupils have well shown this); and that in the blind, whose skin is exceptionally discriminative, it seems to have become so through the inveterate habit which most of them possess of twitching and moving it under whatever object may touch them, so as to become better acquainted with the conformation of the same. Czermak was the first to notice this. It may be easily verified. Of course *movement of surface under object is (for purposes of stimulation) equivalent to movement of object over surface*. In exploring the shapes and sizes of things by either eye or skin the movements of these organs are incessant and unrestrainable. Every such movement draws the points and lines of the object across the surface, imprints them a hundred times more sharply, and drives them home to the attention. The immense part thus played by movements in our perceptive activity is held by many psychologists^[178] to prove that the muscles are

themselves the space-perceiving organ. Not surface-sensibility, but 'the muscular sense,' is for these writers the original and only revealer of objective extension. But they have all failed to notice with what peculiar intensity muscular contractions call surface-sensibilities into play, and that the mere discrimination of impressions (quite apart from any question of measuring the space between them) largely depends on the mobility of the surface upon which they fall.^[179]

2. The Measurement of the sense-spaces against each other.

What precedes is all we can say in answer to the problem of discrimination. Turn now to that of measurement of the several spaces against each other, that being the first step in our constructing out of our diverse space-experiences the one space we believe in as that of the real world.

The first thing that seems evident is that we have no *immediate* power of comparing together with any accuracy the extents revealed by different sensations. Our mouth-cavity feels indeed to itself smaller, and to the tongue larger, than it feels to the finger or eye, our tympanic membrane feels larger than our finger-tip, our lips feel larger than a surface equal to them on our thigh. So much comparison is immediate; but it is vague; and for anything exact we must resort to other help.

The great agent in comparing the extent felt by one sensory surface with that felt by another, is superposition—superposition of one surface upon another, and superposition of one outer thing upon many surfaces. Thus are exact equivalencies and common measures introduced, and the way prepared for numerical results.

Could we not superpose one part of our skin upon another, or one object on both parts, we should hardly succeed in coming to that knowledge of our own form which we possess. The original differences of bigness of our different parts would remain vaguely operative, and we should have no certainty as to how much lip was equivalent to so much forehead, how much finger to so much back.

But with the power of exploring one part of the surface by another we get a direct perception of cutaneous equivalencies. The primitive differences of bigness are overpowered when we feel by an immediate sensation that a

certain length of thigh-surface is in contact with the entire palm and fingers. And when a motion of the opposite finger-tips draws a line first along this same length of thigh and then along the whole of the hand in question, we get a new manner of measurement, less direct but confirming the equivalencies established by the first. In these ways, by superpositions of parts and by tracing lines on different parts by identical movements, a person deprived of sight can soon learn to reduce all the dimensions of his body to a homogeneous scale. By applying the same methods to objects of his own size or smaller, he can with equal ease make himself acquainted with their extension stated in terms derived from his own bulk, palms, feet, cubits, spans, paces, fathoms (armspreads), etc. In these reductions it is to be noticed that *when the resident sensations of largeness of two opposed surfaces conflict, one of the sensations is chosen as the true standard and the other treated as illusory. Thus an empty tooth-socket is believed to be really smaller than the finger-tip which it will not admit, although it may feel larger; and in general it may be said that the hand, as the almost exclusive organ of palpation, gives its own magnitude to the other parts, instead of having its size determined by them. In general, it is, as Fechner says, the extent felt by the more sensitive part to which the other extents are reduced.*^[180]

But even though exploration of one surface by another were impossible, we could always measure our various surfaces against each other by applying the same extended object first to one and then to another. We should of course have the alternative of supposing that the object itself waxed and waned as it glided from one place to another (cf. above, [p. 141](#)); but the principle of simplifying as much as possible our world would soon drive us out of that assumption into the easier one that objects as a rule keep their sizes, and that most of our sensations are affected by errors for which a constant allowance must be made.

In the retina there is no reason to suppose that the bignesses of two impressions (lines or blotches) falling on different regions are primitively felt to stand in any exact mutual ratio. It is only when the impressions come from the *same object* that we judge their sizes to be the same. And this, too, only when the relation of the object to the eye is believed to be on the whole unchanged. When the object by moving changes its relations to the eye the sensation excited by its image even on the same retinal region

becomes so fluctuating that we end by ascribing no absolute import whatever to the retinal space-feeling which at any moment we may receive. So complete does this overlooking of retinal magnitude become that it is next to impossible to compare the visual magnitudes of objects at different distances without making the experiment of superposition. We cannot say beforehand how much of a distant house or tree our finger will cover. The various answers to the familiar question, How large is the moon?—answers which vary from a cartwheel to a wafer—illustrate this most strikingly. The hardest part of the training of a young draughtsman is his learning to feel directly the retinal (i.e. primitively sensible) magnitudes which the different objects in the field of view subtend. To do this he must recover what Ruskin calls the 'innocence of the eye'—that is, a sort of childish perception of stains of color merely as such, without consciousness of what they mean.

With the rest of us this innocence is lost. *Out of all the visual magnitudes of each known object we have selected one as the REAL one to think of, and degraded all the others to serve as its signs.* This 'real' magnitude is determined by æsthetic and practical interests. It is that which we get when the object is at the distance most propitious for exact visual discrimination of its details. This is the distance at which we hold anything we are examining. Farther than this we see it too small, nearer too large. And the larger and the smaller feeling vanish in the act of suggesting this one, their more important *meaning*. As I look along the dining-table I overlook the fact that the farther plates and glasses *feel* so much smaller than my own, for I *know* that they are all equal in size; and the feeling of them, which is a present sensation, is eclipsed in the glare of the knowledge, which is a merely imagined one.

If the inconsistencies of sight-spaces *inter se* can thus be reduced, of course there can be no difficulty in equating sight-spaces with spaces given to touch. In this equation it is probably the touch-feeling which prevails as real and the sight which serves as sign—a reduction made necessary not only by the far greater constancy of felt over seen magnitudes, but by the greater practical interest which the sense of touch possesses for our lives. As a rule, things only benefit or harm us by coming into direct contact with our skin: sight is only a sort of anticipatory touch; the latter is, in Mr. Spencer's phrase, the 'mother-tongue of thought,' and the handmaid's idiom must be

translated into the language of the mistress before it can speak clearly to the mind.^[181]

Later on we shall see that the feelings excited in the joints when a limb moves are used as signs of the path traversed by the extremity. But of this more anon. As for the equating of sound-, smell-, and taste-volumes with those yielded by the more discriminative senses, they are too vague to need any remark. It may be observed of pain, however, that its size has to be reduced to that of the normal tactile size of the organ which is its seat. A finger with a felon on it, and the pulses of the arteries therein, both 'feel' larger than we believe they really 'are.'

It will have been noticed in the account given that *when two sensorial space-impressions, believed to come from the same object, differ, then THE ONE MOST INTERESTING, practically or æsthetically, IS JUDGED TO BE THE TRUE ONE.* This law of interest holds throughout—though a permanent interest, like that of touch, may resist a strong but fleeting one like that of pain, as in the case just given of the felon.

3. The Summation of the Sense-spaces.

Now for the next step in our construction of real space: *How are the various sense-spaces added together into a consolidated and unitary continuum?* For they are, in man at all events, incoherent at the start.

Here again the first fact that appears is that *primitively our space-experiences form a chaos, out of which we have no immediate faculty for extricating them. Objects of different sense-organs, experienced together, do not in the first instance appear either inside or alongside or far outside of each other, neither spatially continuous nor discontinuous, in any definite sense of these words.* The same thing is almost as true of objects felt by different parts of the same organ before discrimination has done its finished work. The most we can say is that all our space-experiences together form an *objective total* and that this *objective total* is vast.

Even now the space inside our mouth, which is so intimately known and accurately measured by its inhabitant the tongue, can hardly be said to have its internal directions and dimensions known in any exact relation to those of the larger world outside. It forms almost a little world by itself. Again, when the dentist excavates a small cavity in one of our teeth, we feel the hard point of his instrument scraping, in distinctly differing directions, a surface which seems to our sensibility vaguely larger than the subsequent use of the mirror tells us it 'really' is. And though the directions of the scraping differ so completely *inter se*, not one of them can be identified with the particular direction in the outer world to which it corresponds. The space of the tooth-sensibility is thus really a little world by itself, which can only become congruent with the outer space-world by farther experiences which shall alter its bulk, identify its directions, fuse its margins, and finally imbed it as a definite part within a definite whole. And even though every joint's rotations should be felt to vary *inter se* as so many differences of direction in a common room; even though the same were true of diverse tracings on the skin, and of diverse tracings on the retina respectively, it would still not follow that feelings of direction, on these different surfaces, are intuitively comparable among each other, or with the other directions yielded by the feelings of the semi-circular canals. It would not follow that we should immediately judge the relations of them all to each other in one space-world.

If with the arms in an unnatural attitude we 'feel' things, we are perplexed about their shape, size, and position. Let the reader lie on his back with his arms stretched above his head, and it will astonish him to find how ill able he is to recognize the geometrical relations of objects placed within reach of his hands. But the geometrical relations here spoken of are nothing but identities recognized between the directions and sizes perceived in this way and those perceived in the more usual ways. The two ways do not fit each other intuitively.

How lax the connection between the system of visual and the system of tactile directions is in man, appears from the facility with which microscopists learn to reverse the movements of their hand in manipulating things on the stage of the instrument. To move the slide to the *seen* left they must draw it to the *felt* right. But in a very few days the habit becomes a second nature. So in tying our cravat, shaving before a mirror, etc., the right

and left sides are inverted, and the directions of our hand movements are the opposite of what they seem. Yet this never annoys us. Only when by accident we try to tie the cravat of another person do we learn that there are two ways of combining sight and touch perceptions. Let any one try for the first time to write or draw while looking at the image of his hand and paper in a mirror, and he will be utterly bewildered. But a very short training will teach him to undo in this respect the associations of his previous lifetime.

Prisms show this in an even more striking way. If the eyes be armed with spectacles containing slightly prismatic glasses with their bases turned, for example, towards the right, every object looked at will be apparently translocated to the left; and the hand put forth to grasp any such object will make the mistake of passing beyond it on the left side. But less than an hour of practice in wearing such spectacles rectifies the judgment so that no more mistakes are made. In fact the new-formed associations are already so strong, that when the prisms are first laid aside again the opposite error is committed, the habits of a lifetime violated, and the hand now passed to the right of every object which it seeks to touch.

The primitive chaos thus subsists to a great degree through life so far as our immediate sensibility goes. We feel our various objects and their bignesses, together or in succession; but so soon as it is a question of the order and relations of many of them at once our intuitive apprehension remains to the very end most vague and incomplete. Whilst we are attending to one, or at most to two or three objects, all the others *lapse*, and the most we feel of them is that they still linger on the outskirts and can be caught again by turning in a certain way. Nevertheless *throughout all this confusion we conceive of a world spread out in a perfectly fixed and orderly fashion, and we believe in its existence. The question is: How do this conception and this belief arise? How is the chaos smoothed and straightened out?*

Mainly by two operations: Some of the experiences are apprehended to exist out- and alongside of each other, and others are apprehended to interpenetrate each other, and to occupy the same room. In this way what was incoherent and irrelative ends by being coherent and definitely related;

nor is it hard to trace the principles, by which the mind is guided in this arrangement of its perceptions, in detail.

In the first place, following the great intellectual law of economy, we simplify, unify, and identify as much as we possibly can. *Whatever sensible data can be attended to together we locate together. Their several extents seem one extent. The place at which each appears is held to be the same with the place at which the others appear. They become, in short, so many properties of ONE AND THE SAME REAL THING.* This is the first and great commandment, the fundamental 'act' by which our world gets spatially arranged.

In this *coalescence in a 'thing,'* one of the coalescing sensations is held to *be* the thing, the other sensations are taken for its more or less accidental *properties*, or modes of appearance.^[182] The sensation chosen to be the thing essentially is the most constant and practically important of the lot; most often it is hardness or weight. But the hardness or weight is never without tactile bulk; and as we can always see something in our hand when we feel something there, we equate the bulk felt with the bulk seen, and thenceforward this common bulk is also apt to figure as of the essence of the 'thing.' Frequently a shape so figures, sometimes a temperature, a taste, etc.; but for the most part temperature, smell, sound, color, or whatever other phenomena may vividly impress us simultaneously with the bulk felt or seen, figure among the accidents. Smell and sound impress us, it is true, when we neither see nor touch the thing; but they are strongest when we see or touch, so we locate the *source* of these properties within the touched or seen space, whilst the properties themselves we regard as overflowing in a weakened form into the spaces filled by other things. *In all this, it will be observed, the sense-data whose spaces coalesce into one are yielded by different sense-organs.* Such data have no tendency to displace each other from consciousness, but can be attended to together all at once. Often indeed they vary concomitantly and reach a maximum together. We may be sure, therefore, that the general rule of our mind is to locate *IN each other all* sensations which are associated in simultaneous experience, and do not interfere with each other's perception.^[183]

Different impressions on the same sense-organ do interfere with each other's perception, and cannot well be attended to at once. Hence *we do not locate them in each other's spaces, but arrange them in a serial order of*

exteriority, each alongside of the rest, in a space larger than that which any one sensation brings. This larger space, however, is an object of conception rather than of direct intuition, and bears all the marks of being constructed piecemeal by the mind. The blind man forms it out of tactile, locomotor, and auditory experiences, the seeing man out of visual ones almost exclusively. As the visual construction is the easiest to understand, let us consider that first.

Every single visual sensation or 'field of view' is limited. To get a new field of view for our object the old one must disappear. But the disappearance may be only partial. Let the first field of view be A B C. If we carry our attention to the limit C, it ceases to be the limit, and becomes the centre of the field, and beyond it appear fresh parts where there were none before: [184] A B C changes, in short, to C D E. But although the parts A B are lost to sight, yet their image abides in the memory; and if we think of our first object A B C as having existed or as still existing at all, we must think of it as it was originally presented, namely, as spread out from C in one direction just as C D E is spread out in another. A B and D E can never coalesce in one place (as they could were they objects of different senses) because they can never be perceived at once: we must lose one to see the other. So (the letters standing now for 'things') we get to conceive of the successive fields of things after the analogy of the several things which we perceive in a single field. They must be out- and alongside of each other, and we conceive that their juxtaposed spaces must make a larger space. A B C + C D E must, in short, be imagined to exist in the form of A B C D E or not imagined at all.

We can usually recover anything lost from sight by moving our attention and our eyes back in its direction; and through these constant changes every field of seen things comes at last to be thought of as always having a fringe of *other things possible to be seen* spreading in all directions round about it. Meanwhile the movements concomitantly with which the various fields alternate are also felt and remembered; and gradually (through association) this and that movement come in our thought to suggest this or that extent of fresh objects introduced. Gradually, too, since the objects vary indefinitely

in kind, we abstract from their several natures and think separately of their mere extents, of which extents the various movements remain as the only constant introducers and associates. More and more, therefore, do we think of movement and seen extent as mutually involving each other, until at last (with Bain and J. S. Mill) we may get to regard them as synonymous, and say, "What is the *meaning of the word extent*, unless it be possible movement?"^[185] We forget in this conclusion that (whatever intrinsic extensiveness the movements may appear endowed with), that seen spreadoutness which is the pattern of the abstract extensiveness which we imagine came to us originally from the retinal sensation.

The muscular sensations of the eyeball *signify* this sort of visible spreadoutness, just as this visible spreadoutness may come in later experience to *signify* the 'real' bulks, distances, lengths and breadths known to touch and locomotion.^[186] To the very end, however, in us seeing men, the quality, the nature, the *sort of thing we mean* by extensiveness, would seem to be the sort of feeling which our retinal stimulations bring.

In one deprived of sight the principles by which the notion of real space is constructed are the same. Skin-feelings take in him the place of retinal feelings in giving the quality of lateral spreadoutness, as our attention passes from one extent of them to another, awakened by an object sliding along. Usually the moving object is our hand; and feelings of movement in our joints invariably accompany the feelings in the skin. But the feeling of the skin is what the blind man *means* by his skin; so the size of the skin-feelings stands as the absolute or real size, and the size of the joint-feelings becomes a sign of these. Suppose, for example, a blind baby with (to make the description shorter) a blister on his toe, exploring his leg with his fingertip and feeling a pain shoot up sharply the instant the blister is touched. The experiment gives him four different kinds of sensation—two of them protracted, two sudden. The first pair are the movement-feeling in the joints of the upper limb, and the movement-feeling on the skin of the leg and foot. These, attended to together, have their extents identified as one objective space—the hand moves through the same space in which the leg lies. The second pair of objects are the pain in the blister, and the peculiar feeling the

blister gives to the finger. Their spaces also fuse; and as each marks the end of a peculiar movement-series (arm moved, leg stroked), the movement-spaces are *emphatically* identified with each other at *that* end. Were there other small blisters distributed down the leg, there would be a number of these emphatic points; the movement-spaces would be identified, not only as totals, but point for point.^[187]

Just so with spaces beyond the body's limits. Continuing the joint-feeling beyond the toe, the baby hits another object, which he can still think of when he brings his hand back to its blister again. That object at the end of that joint-feeling means a new place for him, and the more such objects multiply in his experience the wider does the space of his conception grow. If, wandering through the woods to-day by a new path, I find myself suddenly in a glade which affects my senses exactly as did another I reached last week at the end of a different walk, I believe the two identical affections to present the same persisting glade, and infer that I have attained it by two differing roads. The spaces walked over grow congruent by their extremities; though apart from the common sensation which those extremities give me, I should be under no necessity of connecting one walk with another at all. The case in no whit differs when shorter movements are concerned. If, moving first one arm and then another, the blind child gets the same kind of sensation upon the hand, and gets it again as often as he repeats either process, he judges that he has touched the same object by both motions, and concludes that the motions terminate in a common place. From place to place marked in this way he moves, and adding the places moved through, one to another, he builds up his notion of the extent of the outer world. The seeing man's process is identical; only his units, which may be successive bird's-eye views, are much larger than in the case of the blind.

FEELINGS IN JOINTS AND FEELINGS IN MUSCLES.

1. Feelings of Movement in Joints.

I have been led to speak of feelings which arise in joints. As these feelings have been too much neglected in Psychology hitherto, in entering now somewhat minutely into their study I shall probably at the same time

freshen the interest of the reader, which under the rather dry abstractions of the previous pages may presumably have flagged.

When, by simply flexing my right forefinger on its metacarpal joint, I trace with its tip an inch on the palm of my left hand, is my feeling of the size of the inch purely and simply a feeling in the skin of the palm, or have the muscular contractions of the right hand and forearm anything to do with it? In the preceding pages I have constantly assumed spatial sensibility to be an affair of surfaces. At first starting, the consideration of the 'muscular sense' as a space-measurer was postponed to a later stage. Many writers, of whom the foremost was Thomas Brown, in his *Lectures on the Philosophy of the Human Mind*, and of whom the latest is no less a Psychologist than Prof. Delbœuf,^[188] hold that the consciousness of active muscular motion, aware of its own amount, is the *fons et origo* of all spatial measurement. It would seem to follow, if this theory were true, that two skin-feelings, one of a large patch, one of a small one, possess their difference of spatiality, not as an immediate element, but solely by virtue of the fact that the large one, to get its points *successively* excited, demands more muscular contraction than the small one does. Fixed associations with the several amounts of muscular contraction required in this particular experience would thus explain the apparent sizes of the skin-patches, which sizes would consequently not be primitive data but derivative results.

It seems to me that no evidence of the muscular measurements in question exists; but that all the facts may be explained by surface-sensibility, provided we take that of the joint-surfaces also into account.

The most striking argument, and the most obvious one, which an upholder of the muscular theory is likely to produce is undoubtedly this fact: if, with closed eyes, we trace figures in the air with the extended forefinger (the motions may occur from the metacarpal-, the wrist-, the elbow-, or the shoulder-joint indifferently), what we are *conscious of* in each case, and indeed most acutely conscious of, is the geometric path described by the finger-tip. Its angles, its subdivisions, are all as distinctly felt as if seen by the eye; and yet the surface of the finger-tip receives no impression at all.^[189] But with each variation of the figure, the muscular contractions vary, and so do the feelings which these yield. Are not these latter the sensible data that make us aware of the lengths and directions we discern in the traced line?

Should we be tempted to object to this supposition of the advocate of perception by muscular feelings, that we have *learned* the spatial significance of these feelings by reiterated experiences of *seeing* what figure is drawn when each special muscular grouping is felt, so that in the last resort the muscular space feelings would be derived from retinal-surface feelings, our opponent might immediately hush us by pointing to the fact that in persons born blind the phenomenon in question is even more perfect than in ourselves.

If we suggest that the blind may have originally traced the figures on the cutaneous surface of cheek, thigh, or palm, and may now remember the specific figure which each present movement formerly caused the skin-surface to perceive, he may reply that the delicacy of the motor perception far exceeds that of most of the cutaneous surfaces; that, in fact, we can feel a figure traced only in its differentials, so to speak,—a figure which we merely *start* to trace by our finger-tip, a figure which, traced in the same way *on* our finger-tip by the hand of another, is almost if not wholly unrecognizable.

The champion of the muscular sense seems likely to be triumphant *until we invoke the articular cartilages*, as internal surfaces whose sensibility is called in play by every movement we make, however delicate the latter may be.

To establish the part they play in our geometrizing, it is necessary to review a few facts. It has long been known by medical practitioners that, in patients with cutaneous anæsthesia of a limb, whose muscles also are insensible to the thrill of the faradic current, a very accurate sense of the way in which the limb may be flexed or extended by the hand of another may be preserved.^[190] On the other hand, we may have this sense of movement impaired when the tactile sensibility is well preserved. That the pretended feeling of outgoing innervation can play in these cases no part, is obvious from the fact that the movements by which the limb changes its position are passive ones, imprinted on it by the experimenting physician. The writers who have sought a *rationale* of the matter have consequently been driven

by way of exclusion to assume the articular surfaces to be the seat of the perception in question.^[191]

That the joint-surfaces are sensitive appears evident from the fact that in inflammation they become the seat of excruciating pains, and from the perception by everyone who lifts weights or presses against resistance, that every increase of the force opposing him betrays itself to his consciousness principally by the starting-out of new feelings or the increase of old ones, in or about the joints. If the structure and mode of mutual application of two articular surfaces be taken into account, it will appear that, granting the surfaces to *be* sensitive, no more favorable mechanical conditions could be possible for the delicate calling of the sensibility into play than are realized in the minutely graduated rotations and firmly resisted variations of pressure involved in every act of extension or flexion. Nevertheless it is a great pity that we have as yet no direct testimony, no expressions from patients with healthy joints accidentally laid open, of the impressions they experience when the cartilage is pressed or rubbed.

The first approach to direct evidence, so far as I know, is contained in the paper of Lewinski,^[192] published in 1879. This observer had a patient the inner half of whose leg was anæsthetic. When this patient stood up, he had a curious illusion about the position of his limb, which disappeared the moment he lay down again: he thought himself *knock-kneed*. If, as Lewinski says, we assume the inner half of the joint to share the insensibility of the corresponding part of the skin, then he *ought* to feel, when the joint-surfaces pressed against each other in the act of standing, the outer half of the joint most strongly. But this is the feeling he would also get whenever it was by any chance sought to force his leg into a knock-kneed attitude. Lewinski was led by this case to examine the feet of certain ataxic patients with imperfect sense of position. He found in every instance that when the toes were flexed *and drawn upon* at the same time (the joint-surfaces drawn asunder) all sense of the amount of flexion disappeared. On the contrary, when he pressed a toe *in*, whilst flexing it, the patient's appreciation of the amount of flexion was much improved, evidently because the artificial increase of articular pressure made up for the pathological insensibility of the parts.

Since Lewinski's paper an important experimental research by A. Goldscheider^[193] has appeared, which completely establishes our point. This patient observer caused his fingers, arms, and legs to be passively rotated upon their various joints in a mechanical apparatus which registered both the velocity of movement impressed and the amount of angular rotation. No active muscular contraction took place. The minimal felt amounts of rotation were in all cases surprisingly small, being much less than a single angular degree in all the joints except those of the fingers. Such displacements as these, the author says (p. 490), can hardly be detected by the eye. The point of application of the force which rotated the limb made no difference in the result. Rotations round the hip-joint, for example, were as delicately felt when the leg was hung by the heel as when it was hung by the thigh whilst the movements were performed. Anæsthesia of the skin produced by induction-currents also had no disturbing effect on the perception, nor did the various degrees of pressure of the moving force upon the skin affect it. It became, in fact, all the more distinct in proportion as the concomitant pressure-feelings were eliminated by artificial anæsthesia. When the joints themselves, however, were made artificially anæsthetic the perception of the movement grew obtuse and the angular rotations had to be much increased before they were perceptible. All these facts prove according to Herr Goldscheider, that *the joint surfaces and these alone are the starting point of the impressions by which the movements of our members are immediately perceived.*

Applying this result, which seems invulnerable, to the case of the tracing finger-tip, we see that our perception of the latter gives no countenance to the theory of the muscular sense. *We indubitably localize the finger-tip at the successive points of its path by means of the sensations which we receive from our joints.* But if this is so, it may be asked, why do we feel the figure to be traced, not within the joint itself, but in such an altogether different place? And why do we feel it so much larger than it really is?

I will answer these questions by asking another: Why do we move our joints at all? Surely to gain something more valuable than the insipid joint-feelings themselves. And these more interesting feelings are in the main produced upon the *skin* of the moving part, or of some other part over which it passes, or upon the eye. With movements of the fingers we explore the configuration of all real objects with which we have to deal, our own

body as well as foreign things. Nothing that interests us is located in the joint; everything that interests us either *is* some part of our skin, or is something that we see as we handle it. The cutaneously felt and the seen extents come thus to figure as the important things for us to concern ourselves with. Every time the joint moves, even though we neither see, nor feel cutaneously, the reminiscence of skin-events and sights which formerly coincided with that extent of movement, ideally awakened as the movement's import, and the mind drops the present sign to attend to the import alone. The joint-sensation itself, as such, does not disappear in the process. A little attention easily detects it, with all its fine peculiarities, hidden beneath its vaster suggestions; so that really the mind has two space-perceptions before it, congruent in form but different in scale and place, either of which exclusively it may notice, or both at once,—the joint-space which it *feels* and the real space which it *means*.

The joint-spaces serve so admirably as signs because of their capacity for *parallel variation* to all the peculiarities of external motion. There is not a direction in the real world nor a ratio of distance which cannot be matched by some direction or extent of joint-rotation. Joint-feelings, like all feelings, are roomy. Specific ones are contrasted *inter se* as different directions are contrasted within the same extent. If I extend my arm straight out at the shoulder, the rotation of the shoulder-joint will give me one feeling of movement; if then I sweep the arm forward, the same joint will give me another feeling of movement. Both these movements are felt to happen in space, and differ in specific quality. Why shall not the specificness of the quality just consist in the feeling of a peculiar *direction*?^[194] Why may not the several joint-feelings *be* so many perceptions of movement in so many different directions? That we cannot explain why they *should* is no presumption that they *do* not, for we never can explain why any sense-organ should awaken the sensation it does.

But if the joint-feelings are directions and extents, standing in relation to each other, the task of association in interpreting their import in eye- or skin-terms is a good deal simplified. Let the movement *bc*, of a certain joint, derive its absolute space-value from the cutaneous feeling it is always capable of engendering; then the longer movement *abcd* of the same joint will be judged to have a greater space-value, even though it may never have wholly merged with a skin-experience. So of differences of direction: so

much joint-difference = so much skin-difference; therefore, more joint-difference = more skin-difference. *In fact, the joint-feeling can excellently serve as a map on a reduced scale, of a reality which the imagination can identify at its pleasure with this or that sensible extension simultaneously known in some other way.*

When the joint-feeling in itself acquires an emotional interest,—which happens whenever the joint is inflamed and painful,—the secondary suggestions fail to arise, and the movement is felt where it is, and in its intrinsic scale of magnitude.^[195]

The localization of the joint-feeling in a space simultaneously known otherwise (i.e. to eye or skin), is what is commonly called the *extradition or eccentric projection of the feeling*. In the preceding chapter I said a good deal on this subject; but we must now see a little more closely just what happens in this instance of it. The content of the joint-feeling, to begin with, is an object, and *is* in itself a place. For it to be *placed*, say *in the elbow*, the elbow as seen or handled must already have become another object for the mind, and with its place as thus known, the place which the joint-feeling fills must coalesce. That the latter should be felt 'in the elbow' is therefore a 'projection' of it into the place of another object as much as its being felt in the finger-tip or at the end of a cane can be. But when we say 'projection' we generally have in our mind the notion of a *there* as contrasted with a *here*. What is the *here* when we say that the joint-feeling is *there*? The 'here' seems to be the spot which the mind has chosen for its own post of observation, usually some place within the head, but sometimes within the throat or breast—not a rigorously fixed spot, but a region from any portion of which it may send forth its various acts of attention. Extradition from either of *these* regions is the common law under which we perceive the whereabouts of the north star, of our own voice, of the contact of our teeth with each other, of the tip of our finger, of the point of our cane on the ground, or of a movement in our elbow-joint.

But *for the distance between the 'here' and the 'there' to be felt, the entire intervening space must be itself an object of perception*. The consciousness of this intervening space is the *sine qua non* of the joint-feeling's projection to the farther end of it. When it is filled by our own bodily tissues (as where the projection only goes as far as the elbow or finger-tip) we are sensible of its extent alike by our eye, by our exploring movements, and by the resident

sensations which fill its length. When it reaches beyond the limits of our body, the resident sensations are lacking, but limbs and hand and eye suffice to make it known. Let me, for example, locate a feeling of motion coming from my elbow-joint in the point of my cane a yard beyond my hand. Either I see this yard as I flourish the cane, and the seen end of it then absorbs my sensation just as my seen elbow might absorb it, or I am blind and imagine the cane as an object continuing my arm, either because I have explored both arm and cane with the other hand, or because I have pressed them both along my body and leg. If I project my joint-feeling farther still, it is by a conception rather than a distinct imagination of the space. I *think*: 'farther,' 'thrice as far,' etc.; and thus get a symbolic image of a distant path at which I point.^[196] But the 'absorption' of the joint-feeling by the distant spot, in whatever terms the latter may be apprehended, is never anything but that coalescence into one 'thing' already spoken of on [page 184](#), of whatever different sensible objects interest our attention at once.

2. Feelings of Muscular Contraction.

Readers versed in psychological literature will have missed, in our account thus far, the usual invocation of 'the muscular sense.' This word is used with extreme vagueness to cover all resident sensations, whether of motion or position, in our members, and even to designate the supposed feeling of efferent discharge from the brain. We shall later see good reason to deny the existence of the latter feeling. We have accounted for the better part at least of the resident feelings of motion in limbs by the sensibility of the articular surfaces. The skin and ligaments also must have feelings awakened as they are stretched or squeezed in flexion or extension. And I am inclined to think that *the sensations of our contracting muscles themselves probably play as small a part in building up our exact knowledge of space as any class of sensations which we possess*. The muscles, indeed, play an all-important part, but it is through the remote effect of their contractions on other sensitive parts, not through their own resident sensations being aroused. In other words, *muscular contraction is only indirectly instrumental, in giving us space-perceptions, by its effects on surfaces*. In skin and retina it produces a motion of the stimulus upon the surface; in joints it produces a motion of the surfaces upon each other—such motion being by far the most delicate manner of exciting the surfaces in question. One is tempted to

doubt whether the muscular sensibility as such plays even a subordinate part as *sign* of these more immediately geometrical perceptions which are so uniformly associated with it as effects of the contraction objectively viewed.

For this opinion many reasons can be assigned. First, it seems *a priori* improbable that such organs as muscles should give us feelings whose variations bear any exact proportion to the spaces traversed when they contract. As G. E. Müller says,^[197] their sensory nerves must be excited either chemically or by mechanical compression whilst the contractions last, and in neither case can the excitement be proportionate to the position into which the limb is thrown. The chemical state of the muscle depends on the *previous* work more than on the actually present contraction; and the internal pressure of it depends on the resistance offered more than on the shortening attained. *The intrinsic muscular sensations are likely therefore to be merely those of massive strain or fatigue, and to carry no accurate discrimination with them of lengths of path moved through.*

Empirically we find this probability confirmed by many facts. The judicious A. W. Volkmann observes^[198] that:

"Muscular feeling gives tolerably fine evidence as to the *existence* of movement, but hardly any direct information about its extent or direction. We are not aware that the contractions of a *supinator longus* have a wider range than those of a *supinator brevis*; and that the fibres of a bipenniform muscle contract in opposite directions is a fact of which the muscular feeling itself gives not the slightest intimation. Muscle-feeling belongs to that class of general sensations which tell us of our inner states, but not of outer relations; it does not belong among the space-perceiving senses."

E. H. Weber in his article Tastsinn called attention to the fact that muscular movements as large and strong as those of the diaphragm go on continually without our perceiving them as motion.

G. H. Lewes makes the same remark. When we think of our muscular sensations as movements in space, it is because we have ingrained with them in our imagination a movement on a surface simultaneously felt.

"Thus whenever we breathe there is a contraction of the muscles of the ribs and the diaphragm. Since we *see* the chest expanding, we know it as a movement and can only think of it as such. But the diaphragm itself is not seen, and consequently by no one who is not physiologically enlightened on the point is this diaphragm thought of in movement. Nay, even when told by a physiologist that the diaphragm moves at each breathing, every one who has not seen it moving downward pictures it as an upward movement, because the chest moves upward."^[199]

A personal experience of my own seems strongly to corroborate this view. For years I have been familiar, during the act of gaping, with a large, round, smooth sensation in the region of the throat, a sensation characteristic of gaping and nothing else, but which, although I had often wondered about it, never suggested to my mind the motion of anything. The reader probably knows from his own experience exactly what feeling I mean. It was not till one of my students told me, that I learned its objective cause. If we look into the mirror while gaping, we see that at the moment we have this feeling the hanging palate *rises* by the contraction of its intrinsic muscles. The contraction of these muscles and the compression of the palatine mucous membrane are what occasion the feeling; and I was at first astonished that, coming from so small an organ, it could appear so voluminous. Now the curious point is this—that no sooner had I learned by the eye its objective space-significance, than I found myself enabled mentally to *feel* it as a movement upwards of a body in the situation of the uvula. When I now have it, my fancy *injects* it, so to speak, with the image of the rising uvula; and it *absorbs* the image easily and naturally. In a word, a muscular contraction gave me a sensation whereof I was unable during forty years to interpret a motor meaning, of which two glances of the eye made me permanently the master. To my mind no further proof is needed of the fact that muscular contraction, merely as such, need not be perceived directly as so much motion through space.

Take again the contractions of the muscles which make the eyeball rotate. The feeling of these is supposed by many writers to play the chief part in our perceptions of extent. The space seen between two things *means*, according to these authors, nothing but the amount of contraction which is needed to carry the *fovea* from the first thing to the second. But close the

eyes and note the contractions in themselves (even when coupled as they still are with the delicate surface sensations of the eyeball rolling under the lids), and we are surprised at finding how vague their space-import appears. Shut the eyes and roll them, and you can with no approach to accuracy tell the outer object which shall first be seen when you open them again.^[200] Moreover, if our eye-muscle-contractions had much to do with giving us our sense of seen extent, we ought to have a natural illusion of which we find no trace. Since the feeling in the muscles grows disproportionately intense as the eyeball is rolled into an extreme eccentric position, all places on the extreme *margin* of the field of view ought to appear farther from the centre than they really are, for the fovea cannot get to them without an amount of this feeling altogether in excess of the amount of actual rotation.^[201] When we turn to the muscles of the body at large we find the same vagueness. Goldscheider found that the minimal perceived rotation of a limb about a joint was no less when the movement was 'active' or produced by muscular contraction than when it was 'passively' impressed.^[202] The consciousness of active movement became so blunt when the joint (alone!) was made anæsthetic by faradization, that it became evident that the feeling of contraction could never be used for *fine* discrimination of extents. And that it was not used for coarse discriminations appeared clear to Goldscheider from certain other results which are too circumstantial for me to quote in detail.^[203] His general conclusion is that we feel our movements exclusively in our articular surfaces, and that our muscular contractions in all probability hardly occasion this sort of perception at all.^[204]

My conclusion is that the 'muscular sense' must fall back to the humble position from which Charles Bell raised it, and no longer figure in Psychology as the leading organ in space-perception which it has been so long 'cracked up' to be.

Before making a minuter study of Space as apprehended by the eye, we must turn to see what we can discover of space as known to the blind. But as we do so, let us cast a glance upon the results of the last pages, and ask ourselves once more whether the building up of orderly space-perceptions out of primitive incoherency requires any mental powers beyond those

displayed in ordinary intellectual operations. I think it is obvious—granting the spacial *quale* to exist in the primitive sensations—that discrimination, association, addition, multiplication, and division, blending into generic images, substitution of similars, selective emphasis, and abstraction from uninteresting details, are quite capable of giving us all the space-perceptions we have so far studied, without the aid of any mysterious 'mental chemistry' or power of 'synthesis' to create elements absent from the original data of feeling. It cannot be too strongly urged in the face of mystical attempts, however learned, that there is not a landmark, not a length, not a point of the compass in real space which *is* not some *one* of our feelings, either experienced directly as a presentation or ideally suggested by another feeling which has come to serve as its sign. In degrading some sensations to the rank of signs and exalting others to that of realities signified, we smooth out the wrinkles of our first chaotic impressions and make a continuous order of what was a rather incoherent multiplicity. But the *content* of the order remains identical with that of the multiplicity—sensational both, through and through.

HOW THE BLIND PERCEIVE SPACE.

The blind man's construction of real space differs from that of the seeing man most obviously in the larger part which synthesis plays in it, and the relative subordination of analysis. The seeing baby's eyes take in the whole room at once, and discriminative attention must arise in him before single objects are visually discerned. The blind child, on the contrary, must form his mental image of the room by the addition, piece to piece, of parts which he learns to know successively. With our eyes we may apprehend instantly, in an enormous bird's-eye view, a landscape which the blind man is condemned to build up bit by bit after weeks perhaps of exploration. We are exactly in his predicament, however, for spaces which exceed our visual range. We think the ocean as a whole by multiplying mentally the impression we get at any moment when at sea. The distance between New York and San Francisco is computed in days' journeys; that from earth to sun is so many times the earth's diameter, etc.; and of longer distances still we may be said to have no adequate mental image whatever, but only numerical verbal symbols.

But the symbol will often give us the emotional effect of the perception. Such expressions as the abysmal vault of heaven, the endless expanse of ocean, etc., summarize many computations to the imagination, and give the sense of an enormous horizon. So it seems with the blind. They multiply mentally the amount of a distinctly felt freedom to move, and gain the immediate sense of a vaster freedom still. Thus it is that blind men are never without the consciousness of their horizon. They all enjoy travelling, especially with a companion who can describe to them the objects they pass. On the prairies they feel the great openness; in valleys they feel closed in; and one has told me that he thought few seeing people could enjoy the view from a mountain-top more than he. A blind person on entering a house or room immediately receives, from the reverberations of his voice and steps, an impression of its dimensions, and to a certain extent of its arrangement. The tympanic sense noticed on [p. 140](#), *supra*, comes in to help here, and possibly other forms of tactile sensibility not yet understood. Mr. W. Hanks Levy, the blind author of 'Blindness and the Blind' (London), gives the following account of his powers of perception:

"Whether within a house or in the open air, whether walking or standing still, I can tell, although quite blind, when I am opposite an object, and can perceive whether it be tall or short, slender or bulky. I can also detect whether it be a solitary object or a continuous fence; whether it be a close fence or composed of open rails; and often whether it be a wooden fence, a brick or stone wall, or a quick-set hedge. I cannot usually perceive objects if much lower than my shoulder, but sometimes very low objects can be detected. This may depend on the nature of the objects, or on some abnormal state of the atmosphere. The currents of air can have nothing to do with this power, as the state of the wind does not directly affect it; the sense of hearing has nothing to do with it, as when snow lies thickly on the ground objects are more distinct, although the footfall cannot be heard. I seem to perceive objects through the skin of my face, and to have the impressions immediately transmitted to the brain. The only part of my body possessing this power is my face; this I have ascertained by suitable experiments. Stopping my ears does not interfere with it, but covering my face with a thick veil destroys it altogether. None of the five senses have anything to do with the existence of this power, and

the circumstances above named induce me to call this unrecognized sense by the name of 'facial perception.'... When passing along a street I can distinguish shops from private houses, and even point out the doors and windows, etc., and this whether the doors be shut or open. When a window consists of one entire sheet of glass, it is more difficult to discover than one composed of a number of small panes. From this it would appear that glass is a bad conductor of sensation, or at any rate of the sensation specially connected with this sense. When objects below the face are perceived, the sensation seems to come in an oblique line from the object to the upper part of the face. While walking with a friend in Forest Lane, Stratford, I said, pointing to a fence which separated the road from a field, 'Those rails are not quite as high as my shoulder.' He looked at them, and said they were higher. We, however, measured, and found them about three inches lower than my shoulder. At the time of making this observation I was about four feet from the rails. Certainly in this instance facial perception was more accurate than sight. When the lower part of a fence is brickwork, and the upper part rails, the fact can be detected, and the line where the two meet easily perceived. Irregularities in height, and projections and indentations in walls, can also be discovered."

According to Mr. Levy, this power of seeing with the face is diminished by a fog, but not by ordinary darkness. At one time he could tell when a cloud obscured the horizon, but he has now lost that power, which he has known several persons to possess who are totally blind. These effects of aqueous vapor suggest immediately that fluctuations in the heat radiated by the objects may be the source of the perception. One blind gentleman, Mr. Kilburne, an instructor in the Perkins Institution in South Boston, who has the power spoken of in an unusual degree, proved, however, to have no more delicate a sense of temperature in his face than ordinary persons. He himself supposed that his ears had nothing to do with the faculty until a complete stoppage of them, not only with cotton but with putty on top of it, by abolishing the perception entirely, proved his first impression to be erroneous. Many blind men say immediately that their ears are concerned in the matter.

Sounds certainly play a far more prominent part in the mental life of the blind than in our own. In taking a walk through the country, the mutations

of sound, far and near, constitute their chief delight. And to a great extent their imagination of distance and of objects moving from one distant spot to another seems to consist in thinking how a certain sonority would be modified by the change of place. It is unquestionable that the semi-circular-canal feelings play a great part in defining the points of the compass and the direction of distant spots, in the blind as in us. We *start* towards them by feelings of this sort; and so many directions, so many different-feeling starts.^[205]

The only point that offers any theoretic difficulty is the prolongation into space of the direction, after the start. We saw, ten pages back, that for extradition to occur beyond the skin, the portion of skin in question *and* the space beyond must form a common object for some other sensory surface. The eyes are for most of us this sensory surface; for the blind it can only be other parts of the skin, coupled or not with motion. But the mere gropings of the hands in every direction must end by surrounding the whole body with a sphere of felt space. And this sphere must become enlarged with every movement of locomotion, these movements gaining their space-values from the semi-circular-canal feelings which accompany them, and from the farther and farther parts of large fixed objects (such as the bed, the wainscoting, or a fence) which they bring within the grasp. It might be supposed that a knowledge of space acquired by so many successive discrete acts would always retain a somewhat jointed and so to speak, granulated character. When we who are gifted with sight think of a space too large to come into a single field of view, we are apt to imagine it as composite, and filled with more or less jerky stoppings and startings (think, for instance, of the space from here to San Francisco), or else we reduce the scale symbolically and imagine how much larger on a map the distance would look than others with whose totality we are familiar.

I am disposed to believe, after interrogating many blind persons, that the use of imaginary maps on a reduced scale is less frequent with them than with the rest of us. Possibly the extraordinary changeableness of the visual magnitudes of things makes this habit natural to us, while the fixity of tactile magnitudes keeps them from falling into it. (When the blind young man operated on by Dr. Franz was shown a portrait in a locket, he was vastly surprised that the face could be put into so small a compass: it would have seemed to him, he said, as impossible as to put a bushel into a pint.)

Be this as it may, however, the space which each blind man feels to extend beyond his body is felt by him as one smooth continuum—all trace of those muscular startings and stoppings and reversals which presided over its formation having been eliminated from the memory. It seems, in other words, a generic image of the space-element common to all these experiences, with the unessential particularities of each left out. In truth, *where* in this space a start or a stop may have occurred was quite accidental. It may never occur just there again, and so the attention lets it drop altogether. Even as long a space as that traversed in a several-mile walk will not necessarily appear to a blind man's thought in the guise of a series of locomotor acts. Only where there is some distinct locomotor difficulty, such as a step to ascend, a difficult crossing, or a disappearance of the path, will distinct locomotor images constitute the idea. Elsewhere the space seems continuous, and its parts may even all seem coexistent; though, as a very intelligent blind friend once remarked to me, 'To think of such distances involves probably more mental wear and tear and brain-waste in the blind than in the seeing.' This seems to point to a greater element of successive addition and construction in the blind man's idea.

Our own visual explorations go on by means of innumerable stoppings and startings of the eyeballs. Yet these are all effaced from the final space-sphere of our visual imagination. They have neutralized each other. We can even distribute our attention to the right and left sides simultaneously, and think of those two quarters of space as coexistent. Does the smoothing out of the locomotor interruptions from the blind man's tactile space-sphere offer any greater paradox? Surely not. And it is curious to note that both in him and in us there is one particular locomotor feeling that is apt to assert itself obstinately to the last. We and he alike spontaneously imagine space as lying *in front* of us, for reasons too obvious to enumerate. If we think of the space behind us, we, as a rule, have to *turn round* mentally, and in doing so the front space vanishes. But in this, as in the other things of which we have been talking, individuals differ widely. Some, in imagining a room, can think of all its six surfaces at once. Others mentally turn round, or, at least, imagine the room in several successive and mutually exclusive acts (cf. [p. 54](#), above).

Sir William Hamilton, and J. S. Mill after him, have quoted approvingly an opinion of Platner (an eighteenth-century philosopher) regarding the space-perceptions of the blind. Platner says:

"The attentive observation of a person born blind... has convinced me that the sense of touch by itself is altogether incompetent to afford us the representation of extension and space.... In fact, to those born blind, time serves instead of space. Vicinity and distance mean in their mouths nothing more than the shorter or longer time ... necessary to attain from some one feeling to some other."

After my own observation of blind people, I should hardly have considered this as anything but an eccentric opinion, worthy to pair off with that other belief that color is primitively seen without extent, had it not been for the remarkable Essay on Tactile and Visual Space by M. Ch. Dunan, which appeared in the *Revue Philosophique* for 1888. This author quotes^[206] three very competent witnesses, all officials in institutions for the blind [it does not appear from the text that more than one of them was blind himself], who say that blind people *only live in time*. M. Dunan himself does not share exactly this belief, but he insists that the blind man's and the seeing man's representation of space have *absolutely naught* in common, and that we are deceived into believing that what they mean by space is analogous to what we mean, by the fact that so many of them are but semi-blind and still think in visual terms, and from the farther fact that they all *talk* in visual terms just like ourselves. But on examining M. Dunan's reasons one finds that they all rest on the groundless logical assumption that the perception of a geometrical form which we get with our eyes, and that which a blind man gets with his fingers, must either be absolutely identical or absolutely unlike. They cannot be similar in diversity, "for they are simple notions, and it is of the essence of such to enter the mind or leave it all at once, so that one who has a simple notion at all, possesses it in all its completeness.... Therefore, since it is impossible that the blind should have of the forms in question ideas *completely identical* with our seeing ones, it follows that their ideas must be *radically different from and wholly irreducible to our own*."^[207] Hereupon M. Dunan has no difficulty in finding a blind man who still preserves a crude sensation of diffused light, and who says when questioned that *this light has no extent*. Having 'no extent' appears,

however, on farther questioning, to signify merely not enveloping any particular tactile objects, nor being located within their outline; so that (allowing for latitude of expression) the result tallies perfectly with our own view. A relatively stagnant retinal sensation of diffused light, not varying when different objects are handled, would naturally remain an object quite apart. If the word 'extent' were habitually used to denote tactile extent, this sensation, having no tactile associates whatever, would naturally have 'extent' denied of it. And yet all the while it would be *analogous* to the tactile sensations in having the quality of bigness. Of course it would have no *other* tactile qualities, just as the tactile objects have no other optical qualities than bigness. All sorts of analogies obtain between the spheres of sensibility. Why are 'sweet' and 'soft' used so synonymously in most languages? and why are both these adjectives applied to objects of so many sensible kinds? Rough sounds, heavy smells, hard lights, cold colors, are other examples. Nor does it follow from such analogies as these that the sensations compared need be composite and have some of their parts identical. We saw in Chapter XIII that likeness and difference are an elementary relation, not to be resolved in every case into a mixture of absolute identity and absolute heterogeneity of content (cf. Vol. I, pp. 492-3).

I conclude, then, that although in its more superficial determinations the blind man's space is very different from our space, yet a deep analogy remains between the two. 'Big' and 'little,' 'far' and 'near,' are similar contents of consciousness in both of us. But the *measure* of the bigness and the farness is very different in him and in ourselves. He, for example, can have no notion of what we mean by objects appearing smaller as they move away, because he must always conceive of them as of their constant tactile size. Nor, whatever analogy the two extensions involve, should we expect that a blind man receiving sight for the first time should recognize his new-given optical objects by their familiar tactile names. Molyneux wrote to Locke:

"Suppose a man born blind, and now adult, and taught by his touch to distinguish between a cube and a sphere,... so as to tell, when he felt one and the other, which is the cube, which the sphere. Suppose then the cube and sphere placed on a table and the blind man to be made to

see; query, whether by his sight, before he touched them, he could now distinguish and tell which is the globe, which the cube?"

This has remained in literature as 'Molyneux's query.' Molyneux answered 'No.' And Locke says:^[208]

"I agree with this thinking gentleman whom I am proud to call my friend, and am of opinion that the blind man at first sight would not be able to say which was the globe, which the cube, whilst he only saw them; though he could unerringly name them by his touch and certainly distinguish them by the difference of their figures felt."

This opinion has not lacked experimental confirmation. From Chesselden's case downwards, patients operated for congenital cataract have been unable to name at first the things they saw. "So, Puss, I shall know you another time," said Chesselden's patient, after catching the cat, looking at her steadfastly, and setting her down. Some of this incapacity is unquestionably due to general mental confusion at the new experience, and to the excessively unfavorable conditions for perception which an eye with its lens just extirpated affords. That the analogy of inner nature between the retinal and tactile sensations goes beyond mere extensity is proved by the cases where the patients were the most intelligent, as in the young man operated on by Dr. Franz, who named circular, triangular, and quadrangular figures at first sight.^[209]

VISUAL SPACE.

It is when we come to analyze minutely the conditions of *visual* perception that difficulties arise which have made psychologists appeal to new and *quasi*-mythical mental powers. But I firmly believe that even here exact investigation will yield the same verdict as in the cases studied hitherto. This subject will close our survey of the facts; and if it give the result I foretell, we shall be in the best of positions for a few final pages of critically historical review.

If a common person is asked how he is enabled to see things as they are, he will simply reply, by opening his eyes and looking. This innocent answer has, however, long since been impossible for science. There are various

paradoxes and irregularities about *what* we appear to perceive under seemingly identical optical conditions, which immediately raise questions. To say nothing now of the time-honored conundrums of why we see upright with an inverted retinal picture, and why we do not see double; and to leave aside the whole field of color-contrasts and ambiguities, as not directly relevant to the space-problem,—it is certain that the same retinal image makes us see quite differently-sized and differently-shaped objects at different times, and it is equally certain that the same ocular movement varies in its perceptive import. It ought to be possible, were the act of perception completely and *simply* intelligible, to assign for every distinct judgment of size, shape, and position a distinct optical modification of some kind as its occasion. And the connection between the two ought to be so constant that, given the same modification, we should always have the same judgment. But if we study the facts closely *we soon find no such constant connection between either judgment and retinal modification, or judgment and muscular modification, to exist.* The judgment seems to result from the combination of retinal, muscular and intellectual factors with each other; and any one of them may occasionally overpower the rest in a way which seems to leave the matter subject to no simple law.

The scientific study of the subject, if we omit Descartes, began with Berkeley, and the particular perception he analyzed in his *New Theory of Vision* was that of distance or depth. Starting with the physical assumption that a difference in the distance of a point can make no difference in the nature of its retinal image, since "distance being a line directed endwise to the eye, it projects only one point in the fund of the eye—which point remains invariably the same, whether the distance be longer or shorter," he concluded that distance could not possibly be a visual sensation, but must be an intellectual 'suggestion' from 'custom' of some non-visual experience. According to Berkeley this experience was tactile. His whole treatment of the subject was excessively vague,—no shame to him, as a breaker of fresh ground,—but as it has been adopted and enthusiastically hugged in all its vagueness by nearly the whole line of British psychologists who have succeeded him, it will be well for us to begin our study of vision by refuting his notion that depth cannot possibly be perceived in terms of purely visual feeling.

The Third Dimension.

Berkeleyans unanimously assume that no retinal sensation can primitively be of volume; if it be of extension at all (which they are barely disposed to admit), it can be only of two-, not of three-, dimensional extension. At the beginning of the present chapter we denied this, and adduced facts to show that all objects of sensation are voluminous in three dimensions (cf. [p. 136](#) ff.). It is impossible to lie on one's back on a hill, to let the empty abyss of blue fill one's whole visual field, and to sink deeper and deeper into the merely sensational mode of consciousness regarding it, without feeling that an indeterminate, palpitating, circling depth is as indefeasibly one of its attributes as its breadth. We may artificially exaggerate this sensation of depth. Rise and look from the hill-top at the distant view; represent to yourself as vividly as possible the distance of the uttermost horizon; and then *with inverted head* look at the same. There will be a startling increase in the perspective, a most sensible recession of the maximum distance; and as you raise the head you can actually see the horizon-line again draw near. [\[210\]](#)

Mind, I say nothing as yet about our estimate of the 'real' amount of this depth or distance. I only want to confirm its existence as a natural and inevitable optical consort of the two other optical dimensions. The field of view is always a *volume-unit*. Whatever be supposed to be its absolute and 'real' size, the relative sizes of its dimensions are functions of each other. Indeed, it happens perhaps most often that the breadth- and height-feeling take their absolute measure from the depth-feeling. If we plunge our head into a wash-basin, the felt nearness of the bottom makes us feel the lateral expanse to be small. If, on the contrary, we are on a mountain-top, the distance of the horizon carries with it in our judgment a proportionate height and length in the mountain-chains that bound it to our view. But as aforesaid, let us not consider the question of absolute size now,—it must later be taken up in a thorough way. Let us confine ourselves to the way in which the three dimensions which are seen, get their values fixed *relatively to each other*.

Reid, in his *Inquiry into the Human Mind*, has a section 'Of the Geometry of Visibles,' in which he assumes to trace what the perceptions would be of a race of 'Idomenians' reduced to the sole sense of sight. Agreeing with

Berkeley that sight alone can give no knowledge of the third dimension, he humorously deduces various ingenious absurdities in their interpretations of the material appearances before their eyes.

Now I firmly believe, on the contrary, that one of Reid's Idomenians would frame precisely the same conception of the external world that we do, if he had our intellectual powers.^[211] Even were his very eyeballs fixed and not movable like ours, that would only retard, not frustrate, his education. For the *same object*, by alternately covering in its lateral movements different parts of his retina, would determine the mutual equivalencies of the first two dimensions of the field of view; and by exciting the physiological cause of his perception of depth in various degrees, it would establish a scale of equivalency between the first two and the third.

First of all, one of the sensations given by the object is chosen to represent its 'real' size and shape, in accordance with the principles laid down on [pp. 178](#) and [179](#). *One sensation measures the 'thing' present, and the 'thing' then measures the other sensations.* The peripheral parts of the retina are equated with the central by receiving the image of the same object. This needs no elucidation in case the object does not change its distance or its front. But suppose, to take a more complicated case, that the object is a stick, seen first in its whole length, and then rotated round one of its ends; let this fixed end be the one near the eye. In this movement the stick's image will grow progressively shorter; its farther end will appear less and less separated laterally from its fixed near end; soon it will be screened by the latter, and then reappear on the opposite side, and finally on that side resume its original length. Suppose this movement to become a familiar experience; the mind will presumably react upon it after its usual fashion (which is that of unifying all data which it is in any way possible to unify), and consider it the movement of a constant object rather than the transformation of a fluctuating one. Now, the *sensation of depth* which it receives during the experience is awakened more by the far than by the near end of the object. But how much depth? What shall measure its amount? Why, at the moment the far end is ready to be eclipsed, the difference of its distance from the near end's distance must be judged equal to the stick's whole length; but that length has already been judged equal to a certain optical sensation of breadth. *Thus we find that given amounts of the visual depth-feeling become signs of fixed amounts of the visual breadth-feeling.*

The measurement of distance is, as Berkeley truly said, a result of suggestion and experience. But visual experience alone is adequate to produce it, and this he erroneously denied.

Suppose a colonel in front of his regiment at dress-parade, and suppose he walks at right angles towards the midmost man of the line. As he advances, and surveys the line in either direction, he looks more and more *down* it and less and less *at* it, until, when abreast of the midmost man, he feels the end men to be *most* distant; then when the line casts hardly any lateral image on his retina at all, what distance shall he judge to be that of the end men? Why, half the length of the regiment as it was originally seen, of course; but this length was a moment ago a retinal object spread out laterally before his sight. He has now merely equated a retinal depth-feeling with a retinal breadth-feeling. If the regiment moved, and the colonel stood still, the result would be the same. In such ways as these a creature endowed with eyes alone could hardly fail of measuring out all three dimensions of the space he inhabited. And we ourselves, I think, although we *may* often 'realize' distance in locomotor terms (as Berkeley says we must always do), yet do so no less often in terms of our retinal map, and always in this way the more spontaneously. Were this not so, the three visual dimensions could not possibly feel to us as homogeneous as they do, nor as commensurable *inter se*.

Let us then admit distance to be at least as genuinely optical a content of consciousness as either height or breadth. The question immediately returns, Can any of them be said in any strictness to be optical sensations? We have contended all along for the affirmative reply to this question, but must now cope with difficulties greater than any that have assailed us hitherto.

Helmholtz and Reid on Sensations.

A sensation is, as we have seen in [Chapter XVII](#), the mental affection that follows most immediately upon the stimulation of the sense-tract. Its antecedent is directly physical, no psychic links, no acts of memory, inference, or association intervening. Accordingly, if we suppose the nexus between neural process in the sense-organ, on the one hand, and conscious affection, on the other, to be by nature uniform, *the same process ought always to give the same sensation*; and conversely, *if what seems to be a sensation varies whilst the process in the sense-organ remains unchanged, the reason is presumably that it is really not a sensation but a higher mental product, whereof the variations depend on events occurring in the system of higher cerebral centres.*

Now the *size* of the field of view varies enormously in all three dimensions, without our being able to assign with any definiteness the process in the visual tract on which the variation depends. We just saw how impossible such assignment was in the case where turning down the head produces the enlargement. In general, the maximum feeling of depth or distance seems to take the lead in determining the apparent magnitude of the whole field, and the two other dimensions seem to follow. If, to use the former instance, I look close into a wash-basin, the lateral extent of the field shrinks proportionately to its nearness. If I look from a mountain, the things seen are vast in height and breadth, in proportion to the farness of the horizon. But *when we ask what changes in the eye determine how great this maximum feeling of depth or distance* (which is undoubtedly felt as a unitary vastness) *shall be, we find ourselves unable to point to any one of them as being its absolutely regular concomitant.* Convergence, accommodation, double and disparate images, differences in the parallactic displacement when we move our head, faintness of tint, dimness of outline, and smallness of the retinal image of objects named and known, are all processes that have *something to do* with the perception of 'far' and of 'near'; but the effect of each and any one of them in determining such a perception at one moment may at another moment be reversed by the presence of some other sensible quality in the object, that makes us, evidently by reminding us of past experience, judge it to be at a different distance and of another shape. If we paint the inside of a pasteboard-mask like the outside, and look at it with one eye, the accommodation- and parallax-feelings are there, but fail to make us see it hollow, as it is. Our mental knowledge of the fact that

human faces are always convex overpowers them, and we directly perceive the nose to be nearer to us than the cheek instead of farther of.

The other organic tokens of farness and nearness are proved by similar experiments (of which we shall ere long speak more in detail) to have an equally fluctuating import. They lose all their value whenever the collateral circumstances favor a strong intellectual conviction that the object presented to the gaze is *improbable*—cannot be either *what* or *where* they would make us perceive it to be.

Now the query immediately arises: *Can the feelings of these processes in the eye, since they are so easily neutralized and reversed by intellectual suggestions, ever have been direct sensations of distance at all?* Ought we not rather to assume, since the distances which we see *in spite* of them are conclusions from past experience, that the distances which we see *by means* of them are equally such conclusions? Ought we not, in short, to say unhesitatingly that distance must be an intellectual and not a sensible content of consciousness? and that each of these eye-feelings serves as a mere signal to awaken this content, our intellect being so framed that sometimes it notices one signal more readily and sometimes another?

Reid long ago (Inquiry, c. vi. sec. 17) said:

"It may be taken for a general rule that things which are produced by custom may be undone or changed by disuse or by contrary custom. On the other hand, it is a strong argument that an effect is not owing to custom, but to the constitution of nature, when a contrary custom is found neither to change nor to weaken it."

More briefly, a way of seeing things that can be unlearned was presumably learned, and only what we cannot unlearn is instinctive.

This seems to be Helmholtz's view, for he confirms Reid's maxim by saying in emphatic print:

"No elements in our perception can be sensational which may be overcome or reversed by factors of demonstrably experimental origin. Whatever can be overcome by suggestions of experience must be regarded as itself a product of experience and custom. If we follow this

rule it will appear that only *qualities* are sensational, whilst almost all *spatial* attributes are results of habit and experience."^[212]

This passage of Helmholtz's has obtained, it seems to me, an almost deplorable celebrity. The reader will please observe its very radical import. Not only would he, and does he, for the reasons we have just been ourselves considering, deny distance to be an optical sensation; but, extending the same method of criticism to judgments of size, shape, and direction, and finding no single retinal or muscular process in the eyes to be indissolubly linked with any one of these, he goes so far as to say that all optical space-perceptions whatsoever must have an intellectual origin, and a content that no items of visual sensibility can account for.^[213]

As Wundt and others agree with Helmholtz here, and as their conclusions, if true, are irreconcilable with all the sensationalism which I have been teaching hitherto, it clearly devolves upon me to defend my position against this new attack. But as this chapter on Space is already so overgrown with episodes and details, I think it best to reserve the refutation of their general principle for the next chapter, and simply to assume at this point its untenability. This has of course an arrogant look; but if the reader will bear with me for not very many pages more, I shall hope to appease his mind. Meanwhile I affirm confidently that *the same outer objects actually FEEL different to us according as our brain reacts on them in one way or another by making us perceive them as this or as that sort of thing*. So true is this that one may well, with Stumpf,^[214] reverse Helmholtz's query, and ask: "What would become of our sense-perceptions in case experience were *not* able so to transform them?" Stumpf adds: "All wrong perceptions that depend on peculiarities in the organs are more or less perfectly corrected by the influence of imagination following the guidance of experience."

If, therefore, among the facts of optical space-perception (which we must now proceed to consider in more detail) we find instances of an identical organic eye-process, giving us different perceptions at different times, in consequence of different collateral circumstances suggesting different objective facts to our imagination, we must not hastily conclude, with the school of Helmholtz and Wundt, that the organic eye-process pure and simple, without the collateral circumstances, is incapable of giving us any sensation of a spatial kind at all. We must rather seek to discover *by what*

means the circumstances can so have transformed a space-sensation, which, but for their presence, would probably have been felt in its natural purity. And I may as well say now in advance that we shall find the means to be nothing more or less than association—the *suggestion to the mind of optical objects not actually present*, but more habitually associated with the 'collateral circumstances' than the sensation which they now displace and being imagined now with a quasi-hallucinatory strength. But before this conclusion emerges, it will be necessary to have reviewed the most important facts of optical space-perception, in relation to the organic conditions on which they depend. Readers acquainted with German optics will excuse what is already familiar to them in the following section.^[215]

Let us begin the long and rather tedious inquiry by the most important case. Physiologists have long sought for a simple law by which to connect the seen direction and distance of objects with the retinal impressions they produce. Two principal theories have been held of this matter, the 'theory of identical points,' and the 'theory of projection,'—each incompatible with the other, and each beyond certain limits becoming inconsistent with the facts.

The Theory of Identical Points.



FIG. 54.

This theory starts from the truth that on both retinæ an impression on the upper half makes us perceive an object as below, on the lower half as above, the horizon; and on the right half an object to the left, on the left half one to the right, of the median line. Thus each quadrant of one retina corresponds as a whole to the *similar* quadrant of the other; and within two similar quadrants, *al* and *ar* for example, there should, if the correspondence were consistently carried out, be geometrically similar points which, if impressed at the same time by light emitted from the same object, should cause that

object to appear in the same direction to either eye. Experiment verifies this surmise. If we look at the starry vault with parallel eyes, the stars all seem single; and the laws of perspective show that under the circumstances the parallel light-rays coming from each star must impinge on points within either retina which *are* geometrically similar to each other. The same result may be more artificially obtained. If we take two exactly similar pictures, smaller, or at least no larger, than those on an ordinary stereoscopic slide, and if we look at them as stereoscopic slides are looked at, that is, at one with each eye (a median partition confining the view of either eye to the picture opposite it), we shall see but one flat picture, all of whose parts appear sharp and single.^[216] Identical points being impressed, both eyes see their object in the same direction, and the two objects consequently coalesce into one.

The same thing may be shown in still another way. With fixed head converge the eyes upon some conspicuous objective point behind a pane of glass; then close either eye alternately and make a little ink-mark on the glass, 'covering' the object as seen by the eye which is momentarily open. On looking now with both eyes the ink-marks will seem single, and in the same direction as the objective point. Conversely, let the eyes converge on a single ink-spot on the glass, and then by alternate shutting of them let it be noted what objects behind the glass the spot covers to the right and left eye respectively. Now with both eyes open, both these objects and the spot will appear in the same place, one or other of the three becoming more distinct according to the fluctuations of retinal attention.^[217]

Now what is the direction of this common place? The only way of defining the direction of an object is by *pointing to it*. Most people, if asked to look at an object over the horizontal edge of a sheet of paper which conceals their hand and arm, and then to point their finger at it (raising the hand gradually so that at last a finger-tip will appear above the sheet of paper), are found to place the finger not between either eye and the object, but between the latter and the root of the nose, and this whether both eyes or either alone be used. Hering and Helmholtz express this by saying that we judge of the direction of objects as they would appear to an imaginary cyclopean eye, situated between our two real eyes, and with its optical axis bisecting the angle of convergence of the latter. Our two retinae act, according to Hering, as if they were superposed in the place of this

imaginary double-eye; we see by the corresponding points of each, situated far asunder as they really are, just as we *should* see if they were superposed and could both be excited together.

The judgment of objective singleness and that of identical direction seem to hang necessarily together. And that of identical direction seems to carry with it the necessity of a common origin, between the eyes or elsewhere, from which all the directions felt may seem to be estimated. This is why the cyclopean eye is really a fundamental part of the formulation of the theory of identical retinal points, and why Hering, the greatest champion of this theory, lays so much stress upon it.

It is an immediate consequence of the law of identical projection of images on geometrically similar points that images which fall upon geometrically DISPARATE points of the two retinae should be projected in DISPARATE directions, and that their objects should consequently appear in TWO places, or LOOK DOUBLE. Take the parallel rays from a star falling upon two eyes which converge upon a near object, O, instead of being parallel, as in the previously instanced case. If SL and SR in Fig. 55 be the parallel rays, each of them will fall upon the nasal half of the retina which it strikes.

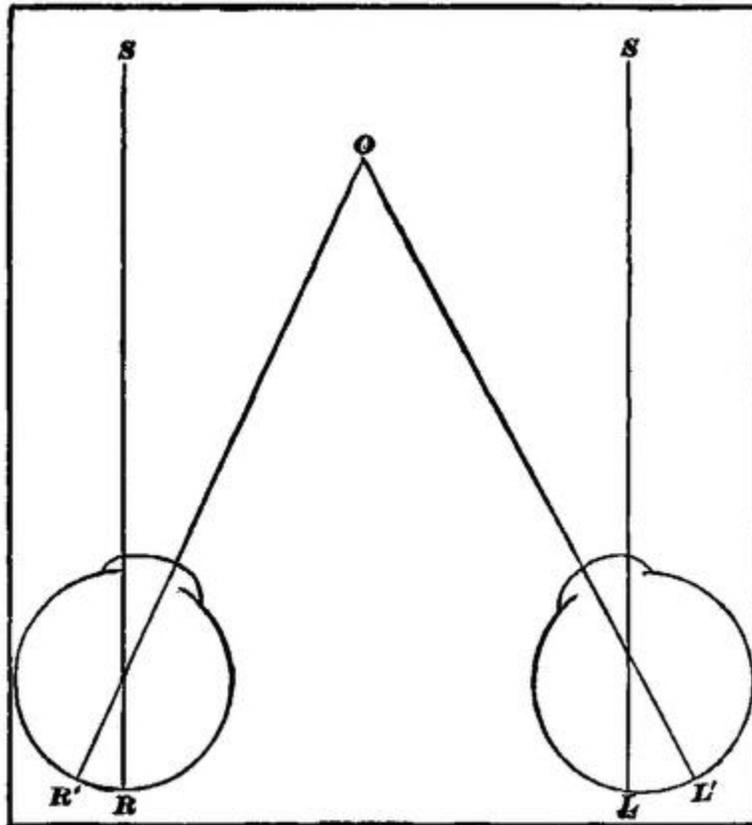


FIG. 55.

But the two nasal halves are disparate, geometrically *symmetrical*, not geometrically *similar*. The image on the left one will therefore appear as if lying in a direction leftward of the cyclopean eye's line of sight; the image of the right one will appear far to the right of the same direction. The star will, in short, be seen double,—'homonymously' double.

Conversely, if the star be looked at directly with parallel axes, O will be seen double, because its images will affect the outer or cheek halves of the two retinae, instead of one outer and one nasal half. The position of the images will here be reversed from that of the previous case. The right eye's image will now appear to the left, the left eye's to the right—the double images will be 'heteronymous.'

The same reasoning and the same result ought to apply where the object's place with respect to the direction of the two optic axes is such as to make its images fall not on non-similar retinal halves, but on non-similar parts of similar halves. Here, of course, the directions of projection will be less widely disparate than in the other case, and the double images will appear to lie less widely apart.

Careful experiments made by many observers according to the so-called haploscopic method confirm this law, and show that *corresponding points, of single visual direction*, exist upon the two retinae. For the detail of these one must consult the special treatises.

Note now an important consequence. If we take a stationary object and allow the eyes to vary their direction and convergence, a purely geometrical study will show that there will be some positions in which its two images impress corresponding retinal points, but more in which they impress disparate points. The former constitute the so-called horopter, and their discovery has been attended with great mathematical difficulty. Objects or parts of objects which lie in the eyes' horopter at any given time cannot appear double. *Objects lying out of the horopter would seem, if the theory of identical points were strictly true, necessarily and always to appear double.*

Here comes the first great conflict of the identity-theory with experience. Were the theory true, we ought all to have an intuitive knowledge of the horopter as the line of distinctest vision. Objects placed elsewhere ought to seem, if not actually double, at least blurred. And yet no living man makes any such distinction between the parts of his field of vision. To most of us the whole field appears single, and it is only by rare accident or by special education that we ever catch a glimpse of a double image. In 1838, Wheatstone, in his truly classical memoir on binocular vision and the stereoscope,^[218] showed that the disparateness of the points on which the two images of an object fall does not within certain limits affect its seen singleness at all, but rather the *distance* at which it shall appear. Wheatstone made an observation, moreover, which subsequently became the bone of much hot contention, in which he strove to show that not only might disparate images fuse, but images on corresponding or identical points might be seen double.^[219]

I am unfortunately prevented by the weakness of my own eyes from experimenting enough to form a decided personal opinion on the matter. It seems to me, however, that the balance of evidence is against the Wheatstonian interpretation, and that disparate points may fuse, without identical points for that reason ever giving double images. The two questions, "Can we see single with disparate points?" and "Can we see double with identical points?" although at the first blush they may appear, as to Helmholtz they appear, to be but two modes of expressing the same

inquiry, are in reality distinct. The first may quite well be answered affirmatively and the second negatively.

Add to this that the experiment quoted from Helmholtz above by no means always succeeds, but that many individuals place their finger between the object and *one* of their eyes, oftenest the right;^[220] finally, observe that the identity-theory, with its Cyclopean starting point for all lines of direction, gives by itself no ground for the *distance* on any line at which an object shall appear, and has to be helped out in this respect by subsidiary hypotheses, which, in the hands of Hering and others, have become so complex as easily to fall a prey to critical attacks; and it will soon seem as if *the law of identical seen directions by corresponding points, although a simple formula for expressing concisely many fundamental phenomena, is by no means an adequate account of the whole matter of retinal perception.*
[221]

The Projection-Theory.

Does the theory of projection fare any better? This theory admits that each eye sees the object in a different direction from the other, along the line, namely, passing from the object through the middle of the pupil to the retina. A point directly fixated is thus seen on the optical axes of both eyes. There is only one point, however, which these two optical axes have in common, and that is the point to which they converge. Everything directly looked at is seen at this point, and is thus seen both single and at its proper distance. It is easy to show the incompatibility of this theory with the theory of identity. Take an objective point (like O in Fig. 50, when the star is looked at) casting its images R' and L' on geometrically dissimilar parts of the two retinae and affecting the outer half of each eye. On the identity-theory it ought necessarily to appear double, whilst on the projection-theory there is no reason whatever why it should not appear single, provided only it be located by the judgment on each line of visible direction, neither nearer nor farther than its point of intersection with the other line.

Every point in the field of view ought, in truth, if the projection-theory were uniformly valid, to appear single, entirely irrespective of the varying positions of the eyes, for from every point of space two lines of visible direction pass to the two retinae; and at the intersection of these lines, or just

where the point is, there, according to the theory, it should appear. *The objection to this theory is thus precisely the reverse of the objection to the identity-theory. If the latter ruled, we ought to see most things double all the time. If the projection-theory ruled, we ought never to see anything double. As a matter of fact we get too few double images for the identity-theory, and too many for the projection-theory.*

The partisans of the projection-theory, beginning with Aguilonius, have always explained double images as the result of an erroneous judgment of the *distance* of the object, the images of the latter being projected by the imagination along the two lines of visible direction either nearer or farther than the point of intersection of the latter. A diagram will make this clear.

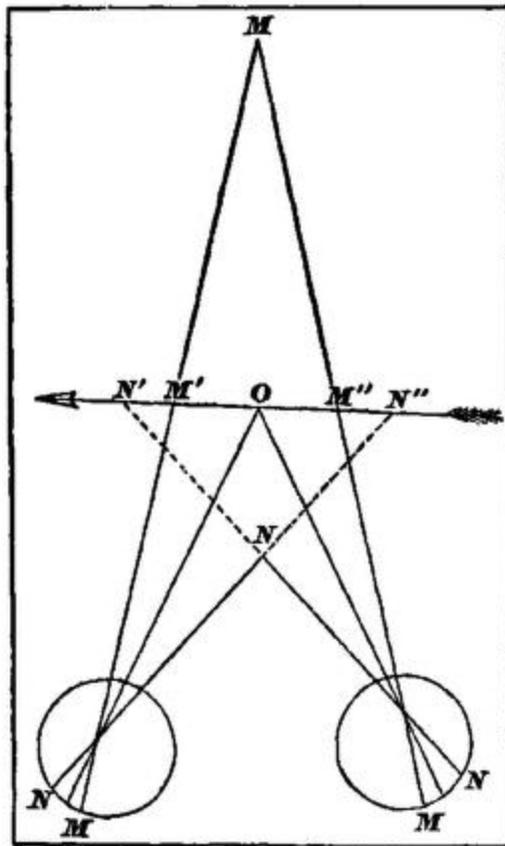


FIG. 56.

Let O be the point looked at, M an object farther, and N an object nearer, than it. Then M and N will send the lines of visible direction MM and NN to the two retinae. If N be judged as far as O, it must necessarily lie where the two lines of visible direction NN intersect the plane of the arrow, or in

two places, at N' and at N". If M be judged as near as O, it must for the same reason form two images at M' and M".

It is, as a matter of fact, true that we often misjudge the distance in the way alleged. If the reader will hold his forefingers, one beyond the other, in the median line, and fixate them alternately, he will see the one not looked at, double; and he will also notice that it appears nearer to the plane of the one looked at, whichever the latter may be, than it really is. Its changes of apparent size, as the convergence of the eyes alter, also prove the change of apparent distance. The distance at which the axes converge seems, in fact, to exert a sort of attraction upon objects situated elsewhere. Being the distance of which we are most acutely sensible, it invades, so to speak, the whole field of our perception. If two half-dollars be laid on the table an inch or two apart, and the eyes fixate steadily the point of a pen held in the median line at varying distances between the coins and the face, there will come a distance at which the pen stands between the left half-dollar and the right eye, and the right half-dollar and the left eye. The two half-dollars will then coalesce into one; and this one will show its apparent approach to the pen-point by seeming suddenly much reduced in size.^[222]

Yet, in spite of this tendency to inaccuracy, we are never actually mistaken about the half-dollar being behind the pen-point. It may not seem far enough off, but still it is farther than the point. In general it may be said that where the objects are known to us, no such illusion of distance occurs in any one as the theory would require. And in some observers, Hering for example, it seems hardly to occur at all. If I look into infinite distance and get my finger in double images, they do not seem infinitely far off. To make objects at different distances seem equidistant, careful precautions must be taken to have them alike in appearance, and to exclude all outward reasons for ascribing to the one a different location from that ascribed to the other. Thus Donders tries to prove the law of projection by taking two similar electric sparks, one behind the other on a dark ground, one seen double; or an iron rod placed so near to the eyes that its double images seem as broad as that of a fixated stove-pipe, the top and bottom of the objects being cut off by screens, so as to prevent all suggestions of perspective, etc. The three objects in each experiment seem in the same plane.^[223]

Add to this the impossibility, recognized by *all* observers, of ever seeing double with the *fovea*, and the fact that authorities as able as those quoted in

the note on Wheatstone's observation deny that they can see double then with identical points, and we are forced to conclude that *the projection-theory, like its predecessor, breaks down. Neither formulates exactly or exhaustively a law for all our perceptions.*

Ambiguity of Retinal Impressions.

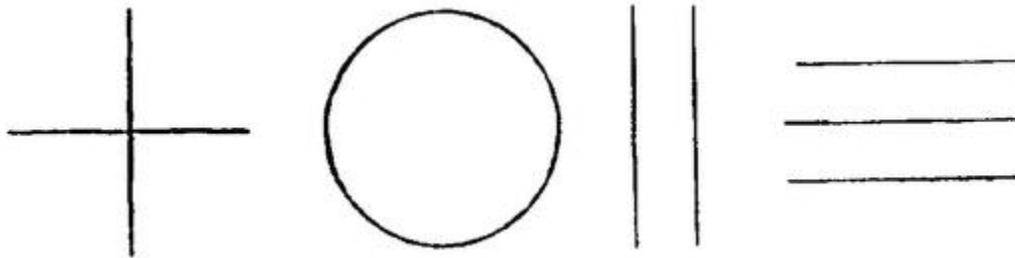


FIG. 57.

What does each theory try to do? To make of seen location a fixed function of retinal impression. Other facts may be brought forward to show how far from fixed are the perceptive functions of retinal impressions. We alluded a while ago to the extraordinary ambiguity of the retinal image as a revealer of magnitude. Produce an after-image of the sun and look at your finger-tip: it will be smaller than your nail. Project it on the table, and it will be as big as a strawberry; on the wall, as large as a plate; on yonder mountain, bigger than a house. And yet it is an unchanged retinal impression. Prepare a sheet with the figures shown in Fig. 57 strongly marked upon it, and get by direct fixation a distinct after-image of each.



FIGS. 58 & 59.

Project the after-image of the cross upon the upper left-hand part of the wall, it will appear as in Fig. 58; on the upper right-hand it will appear as in Fig. 59. The circle similarly projected will be distorted into two different ellipses. If the two parallel lines be projected upon the ceiling or floor far in

front, the farther ends will diverge; and if the three parallel lines be thrown on the same surfaces, the upper pair will seem farther apart than the lower.

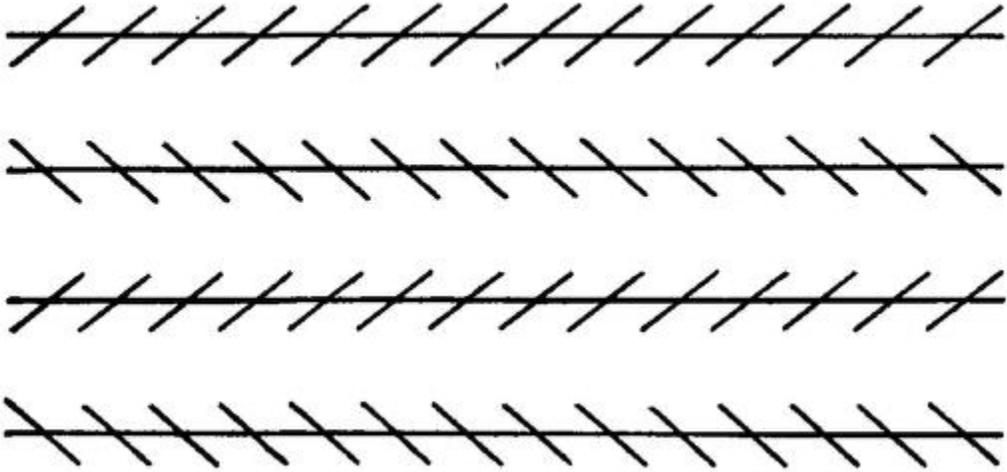


FIG. 60.

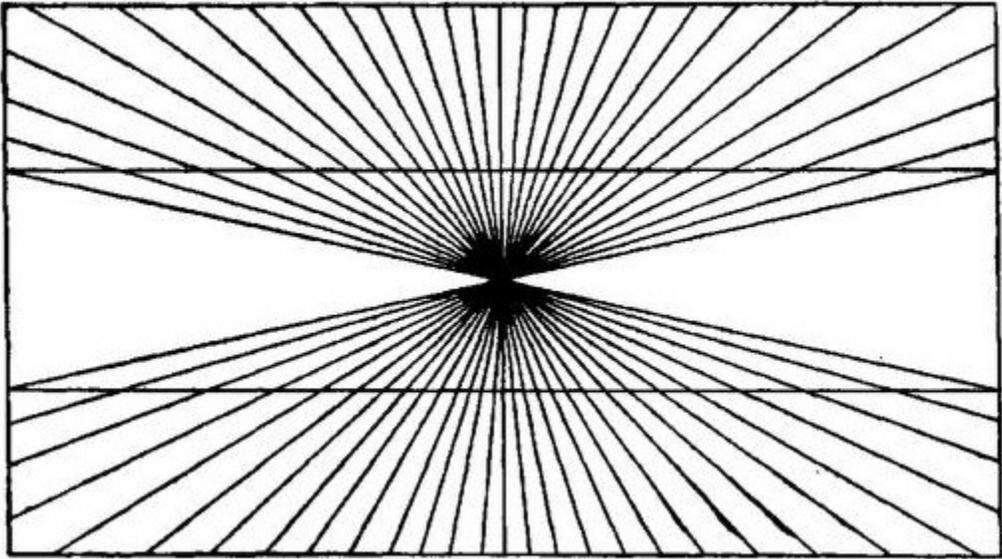


FIG. 61.

Adding certain lines to others has the same distorting effect. In what is known as Zöllner's pattern (Fig. 60), the long parallels tip towards each other the moment we draw the short slanting lines over them yet their retinal images are the same they always were. A similar distortion of parallels appears in Fig 61.

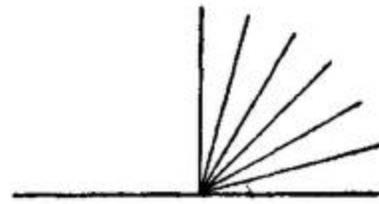
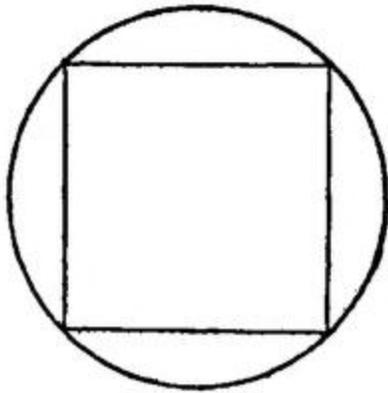


FIG. 62.

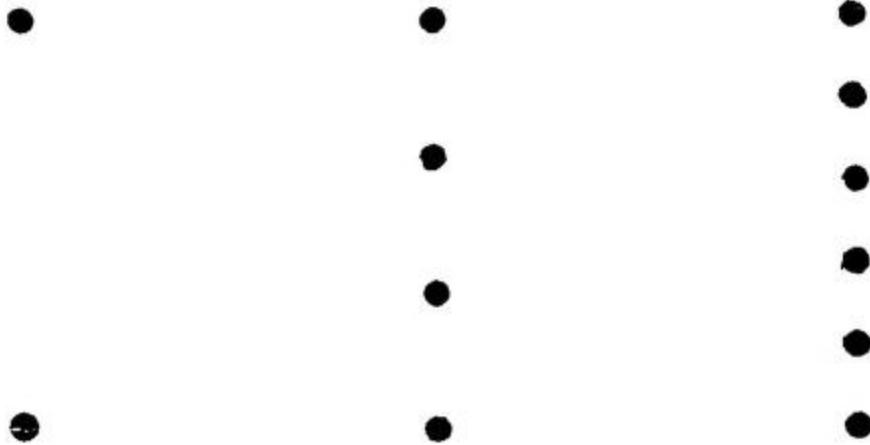


FIG. 63.

Drawing a square inside the circle (Fig. 62) gives to the outline of the latter an indented appearance where the square's corners touch it. Drawing the radii inside of one

[Pg 233] of the right angles in the same figure makes it seem larger than the other. In Fig. 63, the retinal image of the space between the extreme dots is in all three lines the same, yet it seems much larger the moment it is filled up with other dots.

In the stereoscope certain pairs of lines which look single under ordinary circumstances immediately seem double when we add certain other lines to them. [224]

Ambiguous Import of Eye-movements.

These facts show the indeterminateness of the space-import of various *retinal impressions*. Take now the *eye's movements*, and we find a similar vacillation. When we follow a moving object with our gaze, the motion is 'voluntary'; when our eyes oscillate to and fro after we have made ourselves dizzy by spinning around, it is 'reflex'; and when the eyeball is pushed with the finger, it is 'passive.' Now, in all three of these cases we get a feeling from the movement as it effects itself. But the objective perceptions to which the feeling assists us are by no means the same. In the first case we may see a stationary field of view with one moving object in it; in the second, the total field swimming more or less steadily in one direction; in the third, a sudden jump or twist of the same total field.

The feelings of convergence of the eyeballs permit of the same ambiguous interpretation. When objects are near we converge strongly upon them in order to see them; when far, we set our optic axes parallel. But the exact degree of convergence fails to be felt; or rather, being felt, fails to tell us the absolute distance of the object we are regarding. Wheatstone arranged his stereoscope in such a way that the size of the retinal images might change without the convergence altering; or conversely, the convergence might change without the retinal image altering. Under these circumstances, he says,^[225] the object seemed to approach or recede in the first case, without altering its size, in the second, to change its size without altering its distance—just the reverse of what might have been expected. Wheatstone adds, however, that 'fixing the attention' converted each of these perceptions into its opposite. The same perplexity occurs in looking through prismatic glasses, which alter the eyes' convergence. We cannot decide whether the object has come nearer, or grown larger, or both, or neither; and our judgment vacillates in the most surprising way. We may even make our eyes diverge, and the object will none the less appear at a finite distance. When we look through the stereoscope, the picture seems at no determinate distance. These and other facts have led Helmholtz to deny that the feeling of convergence has any very exact value as a distance-measurer.^[226]

With *the feelings of accommodation* it is very much the same. Donders has shown^[227] that the apparent magnifying power of spectacles of moderate convexity hardly depends at all upon their enlargement of the retinal image, but rather on the relaxation they permit of the muscle of accommodation. This suggests an object farther off, and consequently a much larger one,

since its retinal size rather increases than diminishes. But in this case the same vacillation of judgment as in the previously mentioned case of convergence takes place. The recession made the object seem larger, but the apparent growth in size of the object now makes it look as if it came nearer instead of receding. The effect thus contradicts its own cause. Everyone is conscious, on first putting on a pair of spectacles, of a doubt whether the field of view draws near or retreats.^[228]

There is still *another deception, occurring in persons who have had one eye-muscle suddenly paralyzed*. This deception has led Wundt to affirm that the eyeball-feeling proper, the incoming sensation of effected rotation, tells us only of the direction of our eye-movements, but not of their whole extent.^[229] For this reason, and because not only Wundt, but many other authors, think the phenomena in these partial paralyses demonstrate the existence of a feeling of innervation, a feeling of the outgoing nervous current, opposed to every afferent sensation whatever, it seems proper to note the facts with a certain degree of detail.

Suppose a man wakes up some morning with the external rectus muscle of his right eye half paralyzed, what will be the result? He will be enabled only with great effort to rotate the eye so as to look at objects lying far off to the right. Something in the effort he makes will make him feel as if the object lay much farther to the right than it really is. If the left and sound eye be closed, and he be asked to touch rapidly with his finger an object situated towards his right, he will point the finger to the right of it. The current explanation of the 'something' in the effort which causes this deception is that it is the sensation of the outgoing discharge from the nervous centres, the 'feeling of innervation,' to use Wundt's expression, requisite for bringing the open eye with its weakened muscle to bear upon the object to be touched. If that object be situated 20 degrees to the right, the patient has now to innervate as powerfully to turn the eye those 20 degrees as formerly he did to turn the eye 30 degrees. He consequently believes as before that he *has* turned it 30 degrees; until, by a newly-acquired custom, he learns the altered spatial import of all the discharges his brain makes into his right abducens nerve. The 'feeling of innervation,' maintained to exist by this and other observations, plays an immense part in the space-theories of certain philosophers, especially Wundt. I shall elsewhere try to show that the observations by no means warrant the conclusions drawn from them, and

that the feeling in question is probably a wholly fictitious entity.^[230] Meanwhile it suffices to point out that even those who set most store by it are compelled, by the readiness with which the translocation of the field of view becomes corrected and further errors avoided, to admit that the precise space-import of *the supposed sensation of outgoing energy is as ambiguous and indeterminate as that of any other of the eye-feelings we have considered hitherto.*

I have now given what no one will call an understatement of the facts and arguments by which it is sought to banish the credit of directly revealing space from each and every kind of eye-sensation taken by itself. The reader will confess that they make a very plausible show, and most likely wonder whether my own theory of the matter can rally from their damaging evidence. But the case is far from being hopeless; and the introduction of a discrimination hitherto unmade will, if I mistake not, easily vindicate the view adopted in these pages, whilst at the same time it makes ungrudging allowance for all the ambiguity and illusion on which so much stress is laid by the advocates of the intellectualist-theory.

The Choice of the Visual Reality.

We have native and fixed optical space-sensations; *but experience leads us to select certain ones from among them to be the exclusive bearers of reality: the rest become mere signs and suggesters of these.* The factor of *selection*, on which we have already laid so much stress, here as elsewhere is the solving word of the enigma. If Helmholtz, Wundt, and the rest, with an ambiguous retinal sensation before them, meaning now one size and distance, and now another, had not contented themselves with merely saying:—The size and distance are not this sensation, they are something beyond it which it merely calls up, and whose own birthplace is afar—in 'synthesis' (Wundt) or in 'experience' (Helmholtz) as the case may be; if they had gone on definitely to ask and definitely to answer the question, What are the size and distance in their proper selves? they would not only have escaped the present deplorable vagueness of their space-theories, but

they would have seen that the objective spatial attributes 'signified' are simply and solely *certain other optical sensations now absent*, but which the present sensations suggest.

What, for example, is the slant-legged cross which we think we see on the wall when we project the rectangular after-image high up towards our right or left (Figs. 58 and 59)? Is it not in very sooth a retinal sensation itself? An imagined sensation, not a felt one, it is true, but none the less essentially and originally sensational or retinal for that,—the sensation, namely, which we should receive if a 'real' slant-legged cross stood on the wall *in front of us* and threw its image on our eye. That image is not the one our retina now holds. Our retina now holds the image which a cross of square shape throws when in front, but which a cross of the slant-legged pattern *would* throw, provided it were actually on the wall in the distant place at which we look. Call this actual retinal image the 'square' image. The square image is then one of the innumerable images the slant-legged cross can throw. Why should another one, and that an absent one, of those innumerable images be picked out to represent exclusively the slant-legged cross's 'true' shape? Why should that absent and imagined slant-legged image displace the present and felt square image from our mind? Why, when the objective cross gives us so many shapes, as it varies its position, should we think we feel the true shape only when the cross is directly in front? And when that question is answered, how can the absent and represented feeling of a slant-legged figure so successfully intrude itself into the place of a presented square one?

Before answering either question, let us be doubly sure about our facts, and see how true it is that *in our dealings with objects we always do pick out one of the visual images they yield, to constitute the real form or size.*

The matter of size has been already touched upon, so that no more need be said of it here. As regards shape, almost all the retinal shapes that objects throw are perspective 'distortions.' Square table-tops constantly present two acute and two obtuse angles; circles drawn on our wall-papers, our carpets, or on sheets of paper, usually show like ellipses; parallels approach as they recede; human bodies are foreshortened; and the transitions from one to another of these altering forms are infinite and continual. Out of the flux, however, one phase always stands prominent. It is the form the object has when we see it easiest and best: and that is when our eyes and the object

both are in what may be called *the normal position*. In this position our head is upright and our optic axes either parallel or symmetrically convergent; the plane of the object is perpendicular to the visual plane; and if the object is one containing many lines it is turned so as to make them, as far as possible, either parallel or perpendicular to the visual plane. In this situation it is that we compare all shapes with each other; here every exact measurement and decision is made.^[231]

It is very easy to see why the normal situation should have this extraordinary pre-eminence. First, it is the position in which we easiest hold anything we are examining in our hands; second, it is a turning-point between all right- and all left-hand perspective views of a given object; third, it is the only position in which symmetrical figures seem symmetrical and equal angles seem equal; fourth, it is often that starting-point of movements from which the eye is least troubled by axial rotations, by which *superposition*^[232] of the retinal images of different lines and different parts of the same line is easiest produced, and consequently by which the eye can make the best comparative measurements in its sweeps. All these merits single the normal position out to be chosen. No other point of view offers so many æsthetic and practical advantages. Here we believe we see the object as it *is*; elsewhere, only as it seems. Experience and custom soon teach us, however, that the seeming appearance passes into the real one by continuous gradations. They teach us, moreover, that seeming and being may be strangely interchanged. Now a real circle may slide into a seeming ellipse; now an ellipse may, by sliding in the same direction, become a seeming circle; now a rectangular cross grows slant-legged; now a slant-legged one grows rectangular.

Almost any form in oblique vision may be thus a derivative of almost any other in 'primary' vision; and we must learn, when we get one of the former appearances, to translate it into the appropriate one of the latter class; we must learn of what optical 'reality' it is one of the optical signs. Having learned this, we do but obey that law of economy or simplification which dominates our whole psychic life, when we attend exclusively to the 'reality' and ignore as much as our consciousness will let us the 'sign' by which we came to apprehend it. The signs of each probable real thing being multiple and the thing itself one and fixed, we gain the same mental relief by abandoning the former for the latter that we do when we abandon mental

images, with all their fluctuating characters, for the definite and unchangeable *names* which they suggest. The selection of the several 'normal' appearances from out of the jungle of our optical experiences, to serve as the real sights of which we shall think, is psychologically a parallel phenomenon to the habit of thinking in words, and has a like use. Both are substitutions of terms few and fixed for terms manifold and vague.

Sensations which we Ignore.

This service of sensations as mere signs, to be ignored when they have evoked the other sensations which are their significates, was noticed first by Berkeley and remarked in many passages, as the following:

"Signs, being little considered in themselves, or for their own sake, but only in their relative capacity and for the sake of those things whereof they are signs, it comes to pass that the mind overlooks them, so as to carry its attention immediately on to the things signified ... which in truth and strictness are not *seen*, but only *suggested* and *apprehended* by means of the proper objects of sight which alone are seen." (Divine Visual Language, § 12.)

Berkeley of course erred in supposing that the thing suggested was not even *originally* an object of sight, as the sign now is which calls it up. Reid expressed Berkeley's principle in yet clearer language:

"The visible appearances of objects are intended by nature only as signs or indications, and the mind passes instantly to the things signified, without making the least reflection upon the sign, or even perceiving that there is any such thing.... The mind has acquired a confirmed and inveterate habit of inattention to them (the signs). For they no sooner appear than, quick as lightning, the thing signified succeeds and engrosses all our regard. They have no name in language; and although we are conscious of them when they pass through the mind, yet their passage is so quick and so familiar that it is absolutely unheeded; nor do they leave any footsteps of themselves, either in the memory or imagination." (Inquiry, chap. v. §§ 2, 3.)

If we review the facts we shall find every grade of non-attention between the extreme form of overlooking mentioned by Reid (or forms even more extreme still) and complete conscious perception of the sensation present. Sometimes it is literally impossible to become aware of the latter. Sometimes a little artifice or effort easily leads us to discern it together, or in alternation, with the 'object' it reveals. Sometimes the present sensation is held to *be* the object or to reproduce its features in undistorted shape, and *then*, of course, it receives the mind's full glare.

The deepest inattention is to subjective optical sensations, strictly so called, or those which are not signs of outer objects at all. Helmholtz's treatment of these phenomena, *muscæ volitantes*, negative after-images, double images, etc., is very satisfactory. He says:

"We only attend with any ease and exactness to our sensations in so far forth as they can be utilized for the knowledge of outward things; and we are accustomed to neglect all those portions of them which have no significance as regards the external world. So much is this the case that for the most part special artifices and practice are required for the observation of these latter more subjective feelings. Although it might seem that nothing should be easier than to be conscious of one's own sensations, experience nevertheless shows that often enough either a special talent like that showed in eminent degree by Purkinje, or accident or theoretic speculation, are necessary conditions for the discovery of subjective phenomena. Thus, for example, the blind spot on the retina was discovered by Mariotte by the theoretic way; similarly by me the existence of 'summation'-tones in acoustics. In the majority of cases accident is what first led observers whose attention was especially exercised on subjective phenomena to discover this one or that; only where the subjective appearances are so intense that they interfere with the perception of objects are they noticed by all men alike. But if they have once been discovered it is for the most part easy for subsequent observers who place themselves in proper conditions and bend their attention in the right direction to perceive them. But in many cases—for example, in the phenomena of the blind spot, in the discrimination of over-tones and combination-tones from the ground-tone of musical sounds, etc.—such a strain of the attention is required, even with appropriate instrumental aids, that most persons fail. The

very after-images of bright objects are by most men perceived only under exceptionally favorable conditions, and it takes steady practice to see the fainter images of this kind. It is a commonly recurring experience that persons smitten with some eye-disease which impairs vision suddenly remark for the first time the *muscæ volitantes* which all through life their vitreous humor has contained, but which they now firmly believe to have arisen since their malady; the truth being that the latter has only made them more observant of all their visual sensations. There are also cases where one eye has gradually grown blind, and the patient lived for an indefinite time without knowing it, until, through the accidental closure of the healthy eye alone, the blindness of the other was brought to attention.

"Most people, when first made aware of binocular double images, are uncommonly astonished that they should never have noticed them before, although all through their life they had been in the habit of seeing singly only those few objects which were about equally distant with the point of fixation, and the rest, those nearer and farther, which constitute the great majority, had always been double.

"We must then *learn* to turn our attention to our particular sensations, and we learn this commonly only for such sensations as are means of cognition of the outer world. Only so far as they serve this end have our sensations any importance for us in ordinary life. Subjective feelings are mostly interesting only to scientific investigators; were they remarked in the ordinary use of the senses, they could only cause disturbance. Whilst, therefore, we reach an extraordinary degree of firmness and security in objective observation, we not only do not reach this where subjective phenomena are concerned, but we actually attain in a high degree the faculty of overlooking these altogether, and keeping ourselves independent of their influence in judging of objects, even in cases where their strength might lead them easily to attract our attention." (Physiol. Optik, pp. 431-2.)

Even where the sensation is not merely subjective, as in the cases of which Helmholtz speaks, but is a sign of something outward, we are also liable, as Reid says, to overlook its intrinsic quality and attend exclusively to the image of the 'thing' it suggests. But here everyone *can* easily notice the

sensation itself if he will. Usually we see a sheet of paper as uniformly white, although a part of it may be in shadow. But we can in an instant, if we please, notice the shadow as local color. A man walking towards us does not usually seem to alter his size; but we can, by setting our attention in a peculiar way make him appear to do so. The whole education of the artist consists in his learning to see the presented signs as well as the represented things. No matter what the field of view *means*, he sees it also as it *feels*—that is, as a collection of patches of color bounded by lines—the whole forming an optical diagram of whose intrinsic proportions one who is not an artist has hardly a conscious inkling. The ordinary man's attention passes *over* them to their import; the artist's turns back and dwells *upon* them for their own sake. 'Don't draw the thing as it *is*, but as it *looks!*' is the endless advice of every teacher to his pupil; forgetting that what it 'is' is what it would also 'look,' provided it were placed in what we have called the 'normal' situation for vision. In this situation the sensation as 'sign' and the sensation as 'object' coalesce into one, and there is no contrast between them.

Sensations which seem Suppressed.

But a great difficulty has been made of certain peculiar cases which we must now turn to consider. They are *cases in which a present sensation, whose existence is supposed to be proved by its outward conditions being there, seems absolutely suppressed or changed by the image of the 'thing' it suggests.*

This matter carries us back to what was said on [p. 218](#). The passage there quoted from Helmholtz refers to these cases. He thinks they conclusively disprove the original and intrinsic spatiality of any of our retinal sensations; for if such a one, actually present, had an immanent and essential space-determination of its own, that might well be added to and overlaid or even momentarily eclipsed by suggestions of its signification, but how could it possibly be altered or completely *suppressed* thereby? Of actually present sensations, he says, being *suppressed* by suggestions of experience—

"We have not a single well-attested example. In all those illusions which are provoked by *sensations* in the absence of their usually

exciting objects, the mistake never vanishes by the better understanding of the object really present, and by insight into the cause of deception. Phosphenes provoked by pressure on the eyeball, by traction on the entrance of the optic nerve, after-images, etc., remain projected into their apparent place in the field of vision, just as the image projected from a mirror's surface continues to be seen *behind* the mirror, although we *know* that to all these appearances no outward reality corresponds. True enough, we can remove our attention, and keep it removed, from sensations that have no reference to the outer world, those, e.g., of the weaker after-images, and of entoptic objects, etc.... But what would become of our perceptions at all if we had the power not only of ignoring, but of *transforming into their opposites*, any part of them that differed from that outward experience, the image of which, as that of a present reality, accompanies them in the mind?"
[233]

And again:

"On the analogy of all other experience, we should expect that the conquered feelings would persist to our perception, even if only in the shape of recognized illusions. But this is not the case. One does not see how the assumption of originally spatial sensations can explain our optical cognitions, when in the last resort those who believe in these very sensations find themselves obliged to assume that they are *overcome* by our better judgment, based on experience."

These words, coming from such a quarter, necessarily carry great weight. But the authority even of a Helmholtz ought not to shake one's critical composure. And the moment one abandons abstract generalities and comes to close quarters with the particulars, I think one easily sees that no such conclusions as those we have quoted follow from the latter. But profitably to conduct the discussion *we must divide the alleged instances into groups*.

(a) With Helmholtz, *color-perception* is equally with space-perception an intellectual affair. The so-called simultaneous color-contrast, by which one

color modifies another alongside of which it is said, is explained by him as an unconscious inference. In [Chapter XVII](#) we discussed the color-contrast problem; the principles which applied to its solution will prove also applicable to part of the present problem. In my opinion, Hering has definitively proved that, when one color is laid beside another, it modifies the sensation of the latter, not by virtue of any mere mental suggestion, as Helmholtz would have it, but by actually exciting a new nerve-process, to which the modified feeling of color immediately corresponds. The explanation is physiological, not psychological. The transformation of the original color by the inducing color is due to the disappearance of the physiological conditions under which the first color was produced, and to the induction, under the new conditions, of a genuine new sensation, with which the 'suggestions of experience' have naught to do.

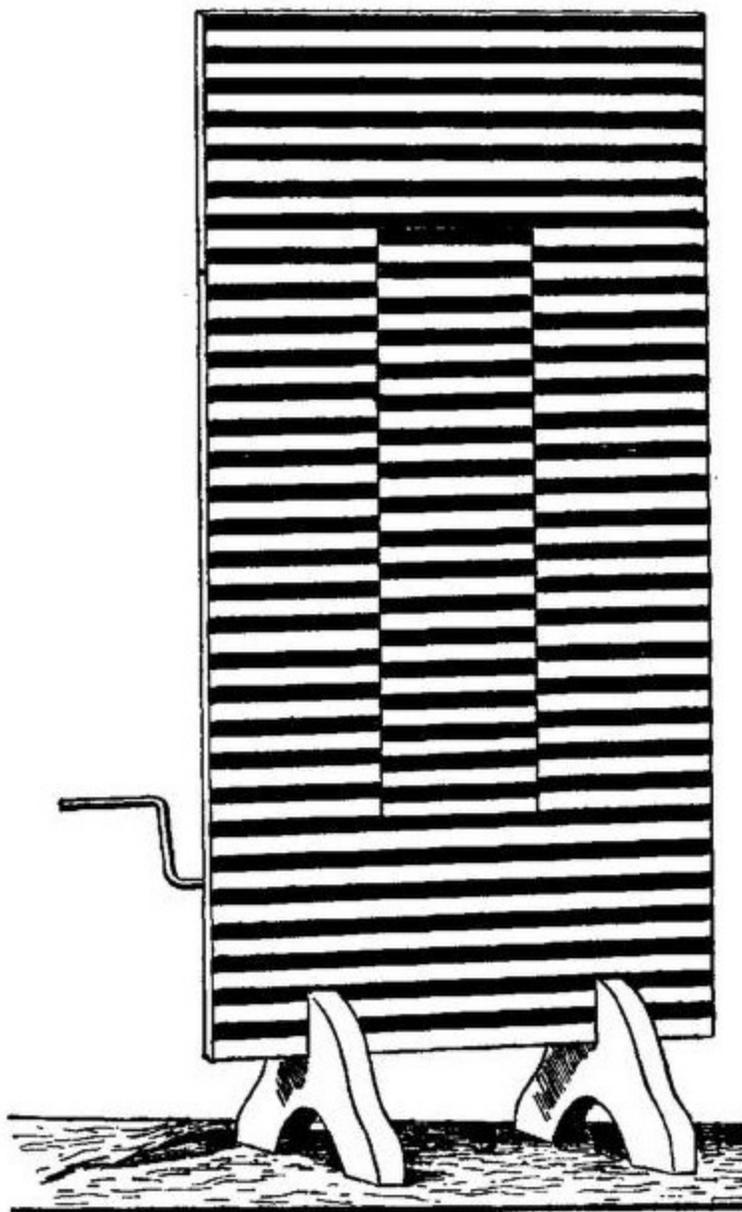


FIG. 64.

That processes in the visual apparatus propagate themselves laterally, if one may so express it, is also shown by the *phenomena of contrast which occur after looking upon motions* of various kinds. Here are a few examples. If, over the rail of a moving vessel, we look at the water rushing along the side, and then transfer our gaze to the deck, a band of planks will appear to us, moving in the opposite direction to that in which, a moment previously, we had been seeing the water move, whilst on either side of this band another band of planks will move as the water did. Looking at a waterfall, or at the road from out of a car-window in a moving tram, produces the same

illusion, which may be easily verified in the laboratory by a simple piece of apparatus. A board with a window five or six inches wide and of any convenient length is supported upright on two feet. On the back side of the board, above and below the window, are two rollers, one of which is provided with a crank. An endless band of any figured stuff is passed over these rollers (one of which can be so adjusted on its bearings as to keep the stuff always taut and not liable to slip), and the surface of the front board is also covered with stuff or paper of a nature to catch the eye. Turning the crank now sets the central band in continuous motion, whilst the margins of the field remain really at rest, but after a while appear moving in the contrary way. Stopping the crank results in an illusory appearance of motion in reverse directions all over the field.

A disk with an Archimedean spiral drawn upon it, whirled round on an ordinary rotating machine, produces still more startling effects.



FIG. 65.

"If the revolution is in the direction in which the spiral line approaches the centre of the disk the entire surface of the latter seems to expand during revolution and to contract after it has ceased; and *vice versa* if the movement of revolution is in the opposite direction. If in the former case the eyes of the observers are turned from the rotating disk towards any familiar object—e.g. the face of a friend—the latter seems to contract or recede in a somewhat striking manner, and to expand or approach after the opposite motion of the spiral."^[234]

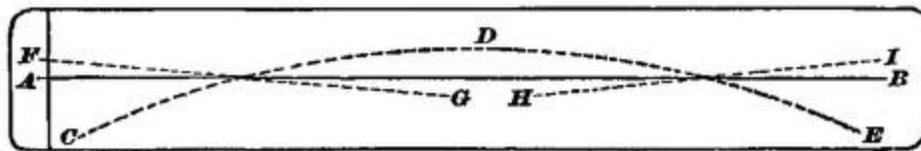


FIG. 66.

An elementary form of these motor illusions seems to be the one described by Helmholtz on pp. 568-571 of his *Optik*. The motion of anything in the field of vision along an acute angle towards a straight line sensibly distorts that line. Thus in Fig. 66: Let AB be a line drawn on paper, CDE the tracing made over this line by the point of a compass steadily followed by the eye, as it moves. As the compass-point passes from C to D, the line appears to move downwards; as it passes from D to E, the line appears to move upwards; at the same time the whole line seems to incline itself in the direction FG during the first half of the compass's movement; and in the direction HI during its last half; the change from one inclination to another being quite distinct as the compass-point passes over D.

Any line across which we draw a pencil-point appears to be animated by a rapid movement of its own towards the pencil-point. This apparent movement of both of two things in relative motion to each other, even when one of them is absolutely still, reminds us of the instances quoted from Vierordt on [page 188](#), and seems to take us back to a primitive stage of perception, in which the discriminations we now make when we feel a movement have not yet been made. If we draw the point of a pencil through 'Zöllner's pattern' (Fig. 60, [p. 232](#)), and follow it with the eye, the whole figure becomes the scene of the most singular apparent unrest, of which Helmholtz has very carefully noted the conditions. The illusion of Zöllner's figure vanishes entirely, or almost so, with most people, if they steadily

look at one point of it with an unmoving eye; and the same is the case with many other illusions.

Now all these facts taken together seem to show—vaguely it is true, but certainly—that present excitements and after-effects of former excitements may alter the result of processes occurring simultaneously at a distance from them in the retina or other portions of the apparatus for optical sensation. In the cases last considered, the moving eye, as it sweeps the fovea over certain parts of the figure, seems thereby to determine a modification in the feeling which the other parts confer, which modification is the figure's 'distortion.' It is true that this statement explains nothing. It only keeps the cases to which it applies from being explained spuriously. The spurious account of these illusions is that they are intellectual, not sensational, that they are secondary, not primary, mental facts. The distorted figure is said to be one which the mind is led to imagine, by falsely drawing an unconscious inference from certain premises of which it is not distinctly aware. And the imagined figure is supposed to be strong enough to suppress the perception of whatever real sensations there may be. But Helmholtz, Wundt, Delbœuf, Zöllner, and all the advocates of unconscious inference are at variance with each other when it comes to the question what these unconscious premises and inferences may be.

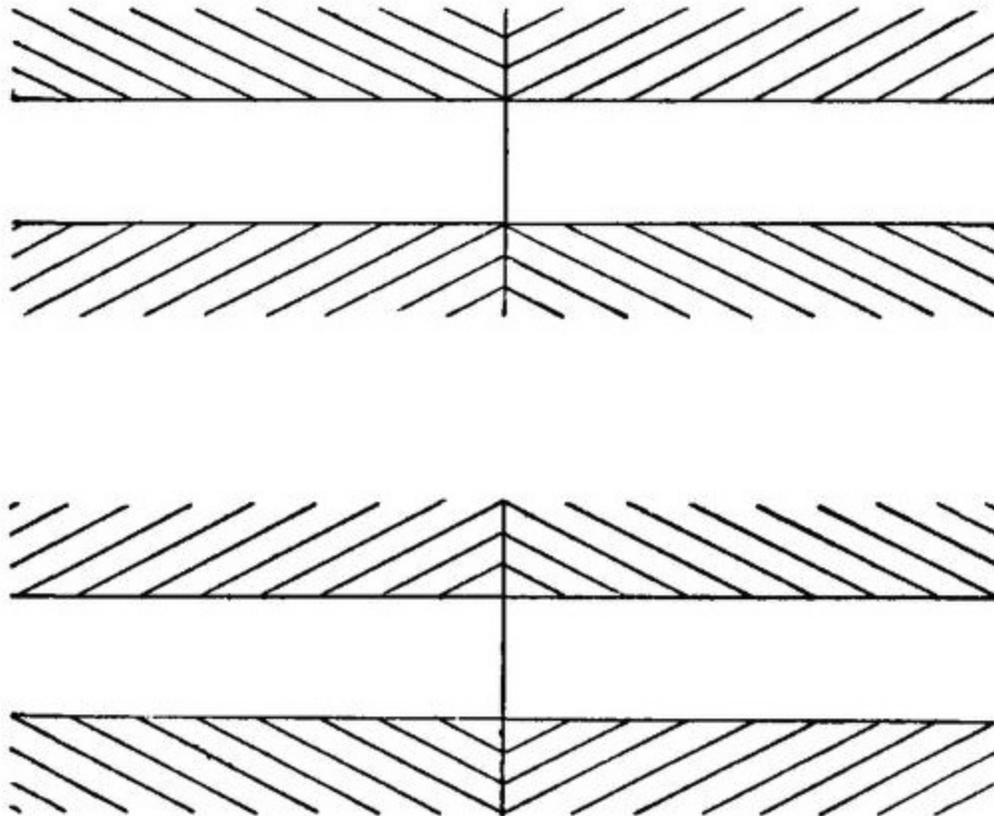


FIG. 67.



FIG. 68.

That small angles look proportionally larger than larger ones is, in brief, the fundamental illusion to which almost all authors would reduce the peculiarity of Fig. 67, as of Figs. 60, 61, 62 (p. 232). This peculiarity of small angles is by Wundt treated as the case of a filled space seeming larger than an empty one, as in Fig. 68; and this, according to both Delbœuf and Wundt, is owing to the fact that more muscular innervation is needed for the eye to traverse a filled space than an empty one, because the points and lines in the filled space inevitably arrest and constrain the eye, and this makes us feel as if it were doing more work, i.e. traversing a longer distance.^[235] When, however, we recollect that muscular movements are positively proved to have *no* share in the waterfall and revolving-spiral illusions, and that it is hard to see how Wundt's and Delbœuf's particular form of muscle-explanation can possibly apply to the compass-point illusion considered a moment ago, we must conclude that these writers have

probably exaggerated, to say the least, the reach of their muscle-explanation in the case of the subdivided angles and lines. Never do we get such strong muscular feelings as when, against the course of nature, we oblige our eyes to be still; but fixing the eyes on one point of the figure, so far from making that part of the latter seem larger, dispels, in most persons, the illusion of these diagrams altogether.

As for Helmholtz, he invokes, to explain the enlargement of small angles, [236] what he calls a '*law of contrast*' between directions and distances of lines, analogous to that between colors and intensities of light. Lines cutting another line make the latter seem more inclined away from them than it really is. Moreover, clearly recognizable magnitudes appear greater than equal magnitudes which we but vaguely apprehend. But this is surely a sensationalistic law, a native function of our seeing-apparatus. Quite as little as the negative after-image of the revolving spiral could such contrast be deduced from any association of ideas or recall of past objects. The principle of contrast is criticised by Wundt, [237] who says that by it small spaces ought to appear to us smaller, and not larger, than they really are. Helmholtz might have retorted (had not the retort been as fatal to the uniformity of his own principle as to Wundt's) that if the muscle-explanation were true, it ought not to give rise to just the opposite illusions in the skin. We saw on [p. 141](#) that subdivided spaces appear shorter than empty ones upon the skin. To the instances there given add this: Divide a line on paper into equal halves, puncture the extremities, and make punctures all along one of the halves; then, with the finger-tip on the opposite side of the paper, follow the line of punctures; the empty half will seem much longer than the punctured half. This seems to bring things back to unanalyzable laws, by reason of which our feeling of size is determined differently in the skin and in the retina, even when the objective conditions are the same. Hering's explanation of Zöllner's figure is to be found in Hermann's *Handb. d. Physiologie*, iii. 1. p. 579. Lipps [238] gives another reason why lines cutting another line make the latter seem to bend away from them more than is really the case. If, he says, we draw (Fig. 69) the line *pm* upon the line *ab*, and follow the latter with our eye, we shall, on reaching the point *m*, tend for a moment to slip off *ab* and to follow *mp*, without distinctly realizing that we are not still on the main line. This makes us feel as if the remainder *mb* of the main line were bent a little away from

its original direction. The illusion is apparent in the shape of a seeming approach of the ends b, b , of the two main lines. This to my mind would be a more satisfactory explanation of this class of illusions than any of those given by previous authors, were it not again for what happens in the skin.

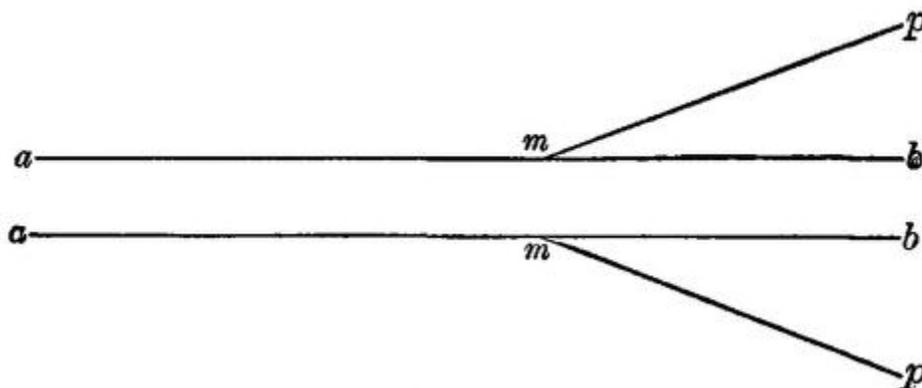


FIG. 69.

Considering all the circumstances, I feel justified in discarding his entire batch of illusions as irrelevant to our present inquiry. Whatever they may prove, they do not prove that our visual percepts of form and movement may not be sensations strictly so called. They much more probably fall into line with the phenomena of irradiation and of color-contrast, and with Vierordt's primitive illusions of movement. They show us, if anything, a realm of sensations in which our habitual experience has not yet made traces, and which persist in spite of our better knowledge, *unsuggestive* of those other space-sensations which we all the time know from extrinsic evidence to constitute the real space-determinations of the diagram. Very likely, if these sensations were as frequent and as practically important as they now are insignificant and rare, we should end by substituting their significates—the real space-values of the diagrams—for them. These latter we should then seem to see directly, and the illusions would disappear like that of the size of a tooth-socket when the tooth has been out a week.

(b) Another batch of cases which we may discard is that of double images. A thoroughgoing anti-sensationalist ought to deny all native tendency to see double images when disparate retinal points are stimulated, because, he should say, most people never get them, but *see* all things single which

experience has led them to believe to *be* single. "Can a doubleness, so easily neutralized by our knowledge, ever be a datum of sensation at all?" such an anti-sensationalist might ask.

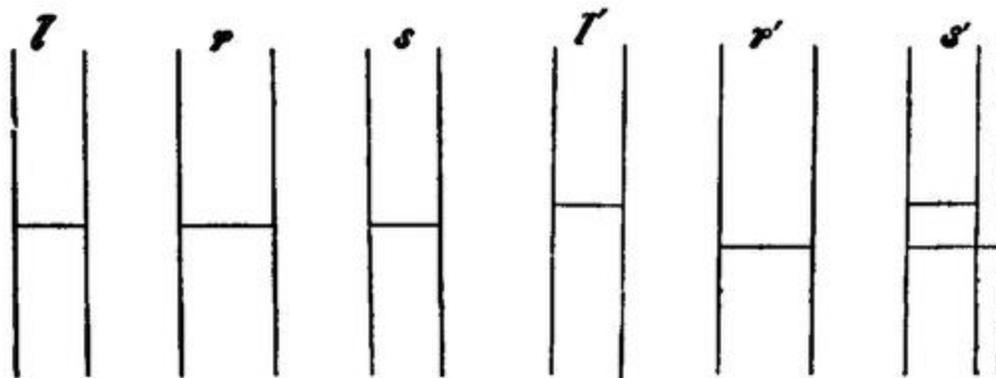


FIG. 70.

To which the answer is that it *is* a datum of sensation, but a datum which, like many other data, must first be *discriminated*. As a rule, no sensible qualities are discriminated without a motive.^[239] And those that later we learn to discriminate were originally felt confused. As well pretend that a voice, or an odor, which we have learned to pick out, is no sensation now. One may easily acquire skill in discriminating double images, though, as Hering somewhere says, it is an art of which one cannot become master in one year or in two. For masters like Hering himself, or Le Conte, the ordinary stereoscopic diagrams are of little use. Instead of combining into one solid appearance, they simply cross each other with their doubled lines. Volkmann has shown a great variety of ways in which the addition of secondary lines, differing in the two fields, helps us to see the primary lines double. The effect is analogous to that shown in the cases which we despatched a moment ago, where given lines have their space-value changed by the addition of new lines, without our being able to say why, except that a certain mutual adhesion of the lines and modification of the resultant feeling takes place by psychophysiological laws. Thus, if in Fig. 70, *l* and *r* be crossed by an horizontal line at the same level, and viewed stereoscopically, they appear as a single pair of lines, *s*, in space. But if the horizontal be at different levels, as in *l'*, *r'*, three lines appear, as in *s''*.^[240]

Let us then say no more about double images. All that the facts prove is what Volkmann says,^[241] that, although there may be sets of retinal fibres so organized as to give an impression of two separate spots, yet the

excitement of other retinal fibres may inhibit the effect of the first excitement, and prevent us from actually making the discrimination. Still farther retinal processes may, however, bring the doubleness to the eye of attention; and, once there, it is as genuine a sensation as any that our life affords.^[242]

(c) These groups of illusions being eliminated, either as cases of defective discrimination, or as changes of one space-sensation into another when the total retinal process changes, there remain but two other groups to puzzle us. The first is that of the after-images distorted by projection on to oblique planes; the second relates to the instability of our judgments of relative distance and size by the eye, and includes especially what are known as pseudoscopic illusions.

The phenomena of the first group were described on [page 232](#). A. W. Volkmann has studied them with his accustomed clearness and care.^[243] Even an imaginarily inclined wall, in a picture, will, if an after-image be thrown upon it, distort the shape thereof, and make us *see* a form of which our after-image would be the natural projection on the retina, were that form laid upon the wall. Thus a signboard is painted in perspective on a screen, and the eye, after steadily looking at a rectangular cross, is turned to the painted signboard. The after-image appears as an oblique-legged cross upon the signboard. It is the converse phenomenon of a perspective drawing like Fig. 71, in which really oblique-legged figures are seen as rectangular crosses.

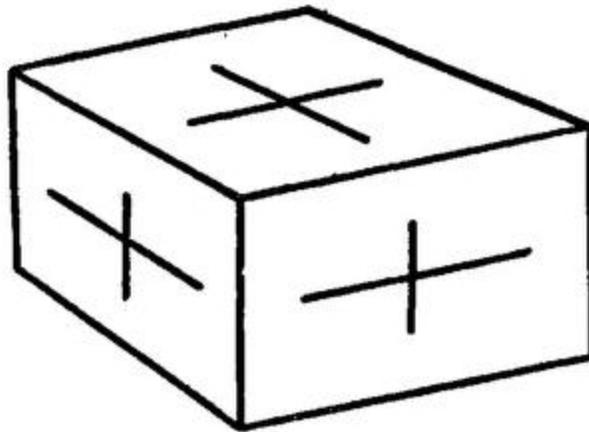


FIG. 71.

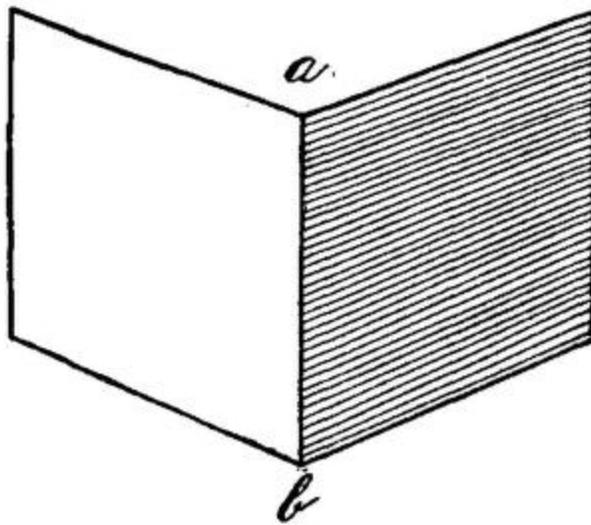


FIG. 72.

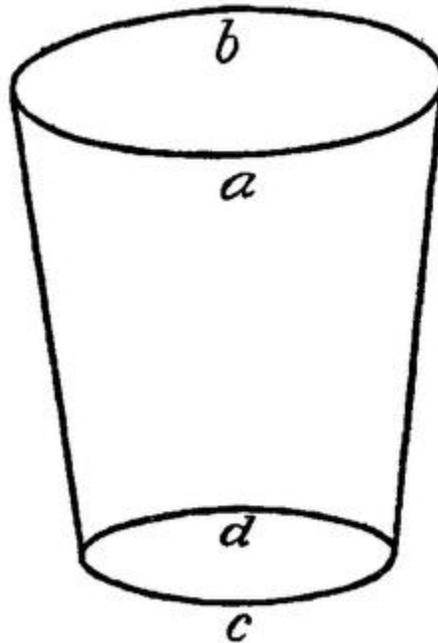


FIG. 73.

The unstable judgments of relative distance and size were also mentioned on [pp. 231-2](#). Whatever the size may be of the retinal image which an object makes, the object is seen as of its own normal size. A man moving towards us is not sensibly perceived to *grow*, for example; and my finger, of which a single joint may more than conceal him from my view, is nevertheless seen as a much smaller object than the man. As for distances, it is often possible to make the farther part of an object seem near and the nearer part far. A human profile in intaglio, looked at steadily with one eye, or even both, soon appears irresistibly as a bas-relief. The inside of a common pasteboard mask, painted like the outside, and viewed with one eye in a direct light, also looks convex instead of hollow. So strong is the illusion, after long fixation, that a friend who painted such a mask for me told me it soon became difficult to see how to apply the brush. Bend a visiting-card across the middle, so that its halves form an angle of 90° more or less; set it upright on the table, as in Fig. 72, and view it with one eye. You can make it appear either as if it opened towards you or away from you. In the former case, the angle ab lies upon the table, b being nearer to you than a ; in the latter case ab seems vertical to the table—as indeed it really is—with a nearer to you than b .^[244] Again, look, with either one or two eyes, at the opening of a wine-glass or tumbler (Fig. 73), held either above or below the eye's level. The retinal image of the opening is an oval,

but we can see the oval in either of two ways,—as if it were the perspective view of a circle whose edge *b* were farther from us than its edge *a* (in which case we should seem to be looking down on the circle), or as if its edge *a* were the more distant edge (in which case we should be looking up at it through the *b* side of the glass). As the manner of seeing the edge changes, the glass itself alters its form in space and looks straight or seems bent towards or from the eye,^[245] according as the latter is placed beneath or above it.

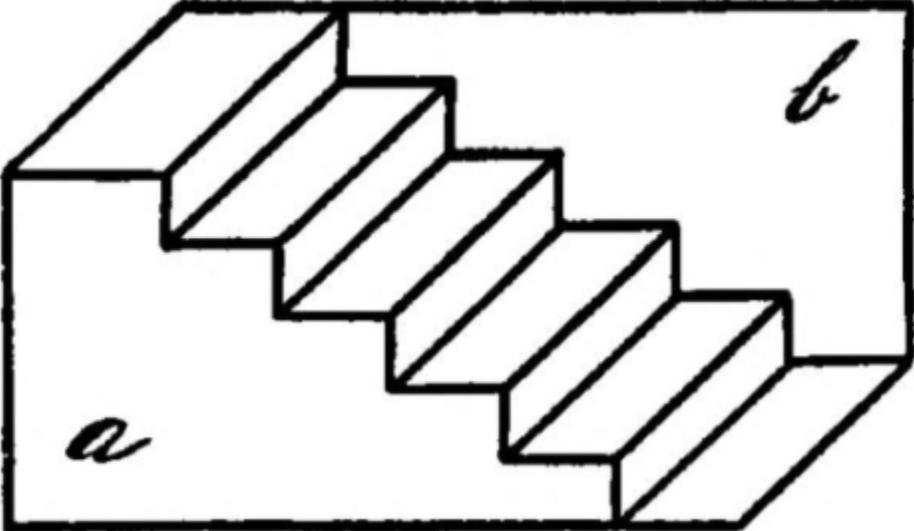


FIG. 74.

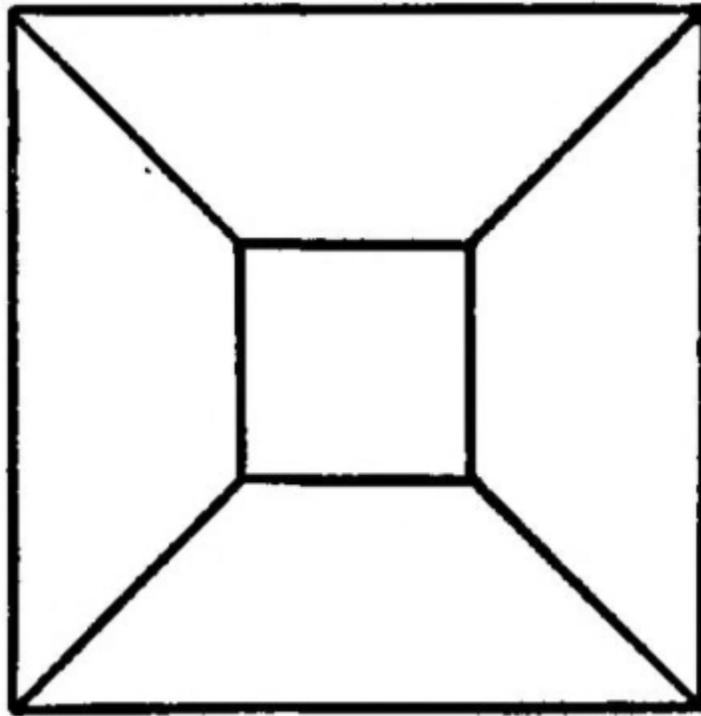


FIG. 75.

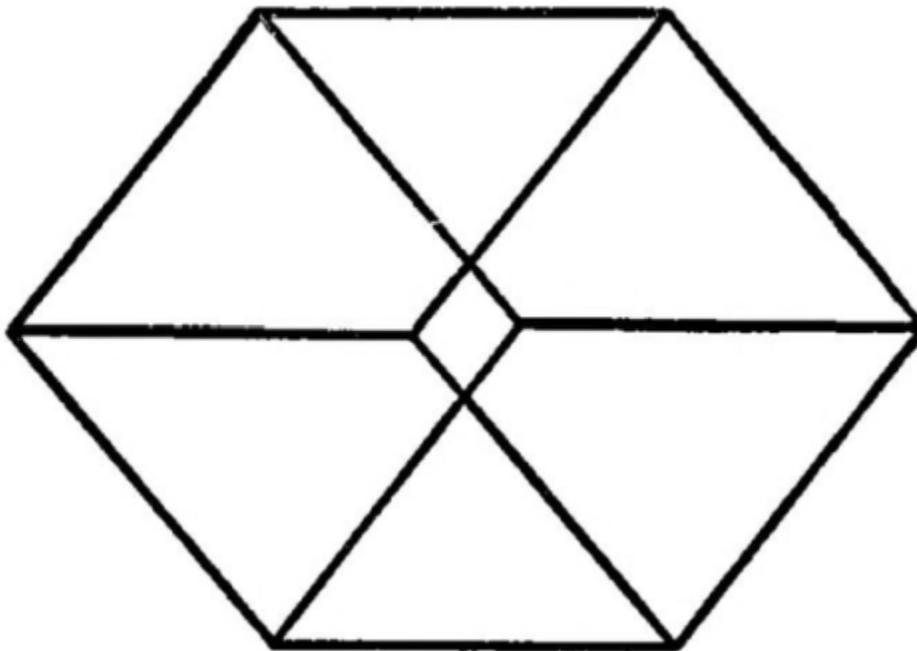


FIG. 76.

Plane diagrams also can be conceived as solids, and that in more than one way. Figs. 74, 75, 76, for example, are ambiguous perspective projections, and may each of them remind us of two different natural objects.

Whichever of these objects we conceive clearly at the moment of looking at the figure, we seem to *see* in all its solidity before us. A little practice will enable us to flap the figures, so to speak, backwards and forwards from one object to the other at will. We need only attend to one of the angles represented, and imagine it either solid or hollow—pulled towards us out of the plane of the paper, or pushed back behind the same—and the whole figure obeys the cue and is instantaneously transformed beneath our gaze.
[246]

The peculiarity of all these cases is the ambiguity of the perception to which the fixed retinal impression gives rise. With our retina excited in exactly the same way, whether by after-image, mask or diagram, we *see* now this object and now that, as if the retinal image *per se* had no essential space-import. Surely if form and length were originally retinal sensations, retinal rectangles ought not to become acute or obtuse, and lines ought not to alter their relative lengths as they do. If *relief* were an optical feeling, it ought not to flap to and fro, with every optical condition unchanged. Here, if anywhere, the deniers of space-sensation ought to be able to make their final stand.
[247]

It must be confessed that their plea is plausible at first sight. But it is one thing to throw out retinal sensibility altogether as a space-yielding function the moment we find an ambiguity in its deliverances, and another thing to examine candidly the conditions which may have brought the ambiguity about. The former way is cheap, wholesale, shallow; the latter difficult and complicated, but full of instruction in the end. Let us try it for ourselves.

In the case of the diagrams 72, 73, 74, 75, 76, the real object, lines meeting or crossing each other on a plane, is replaced by an *imagined solid which we describe as seen. Really it is not seen but only so vividly conceived as to approach a vision of reality.* We feel all the while, however, that the solid suggested is not solidly there. *The reason why one solid may seem more easily suggested than another, and why it is easier in general to perceive the diagram solid than flat, seems due to probability.*
[248] Those lines have countless times in our past experience been drawn on our retina by solids

for once that we have seen them flat on paper. And hundreds of times we have looked down upon the upper surface of parallelepipeds, stairs and glasses, for once that we have looked upwards at their bottom—hence we see the solids easiest as if from above.

Habit or probability seems also to govern the illusion of the intaglio profile, and of the hollow mask. We have *never* seen a human face except in relief—hence the case with which the present sensation is overpowered. Hence, too, the obstinacy with which human faces and forms, and other extremely familiar convex objects, refuse to appear hollow when viewed through Wheatstone's pseudoscope. Our perception seems wedded to certain total ways of seeing certain objects. The moment the object is suggested at all, it takes possession of the mind in the fulness of its stereotyped habitual form. This explains the suddenness of the transformations when the perceptions change. The object shoots back and forth completely from this to that familiar thing, and doubtful, indeterminate, and composite things are excluded, apparently because we are *unused* to their existence.

When we turn from the diagrams to the actual folded visiting-card and to the real glass, the imagined form seems fully as real as the correct one. The card flaps over; the glass rim tilts this way or that, as if some inward spring suddenly became released in our eye. In these changes the actual retinal image receives different *complements from the mind*. But the remarkable thing is that the complement and the image combine so completely that the twain are one flesh, as it were, and cannot be discriminated in the result. If the complement be, as we have called it (on [pp. 237-8](#)), a set of imaginary absent eye-sensations, they seem no whit less vividly there than the sensation which the eye now receives from without.

The case of the after-images distorted by projection upon an oblique plane is even more strange, for the imagined perspective figure, lying in the plane, seems less to combine with the one a moment previously seen by the eye than to suppress it and take its place.^[249] The point needing explanation, then, in all this, is how it comes to pass that, when imagined sensations are usually so inferior in vivacity to real ones, they should in these few experiences prove to be almost or quite their match.

The mystery is solved when we note the class to which all these experiences belong. They are 'perceptions' of definite 'things,' definitely situated in

tridimensional space. The mind uniformly uses its sensations to *identify things by*. The sensation is invariably apperceived by the idea, name, or 'normal' aspect (p. 238) of the *thing*. The peculiarity of the *optical* signs of things is their extraordinary mutability. A 'thing' which we follow with the eye, never doubting of its physical identity, will change its retinal image incessantly. A cross, a ring, waved about in the air, will pass through every conceivable angular and elliptical form. All the while, however, as we look at them, we hold fast to the perception of their 'real' shape, by mentally combining the pictures momentarily received with the notion of peculiar positions in space. It is not the cross and ring pure and simple which we perceive, but the cross *so held*, the ring *so held*. From the day of our birth we have sought every hour of our lives to *correct* the apparent form of things, and translate it into the real form by keeping note of the way they are placed or held. In no other class of sensations does this incessant correction occur. What wonder, then, that the notion 'so placed' should invincibly exert its habitual corrective effect, even when the object with which it combines is only an after-image, and make us perceive the latter under a changed but more 'real' form? The 'real' form is also a sensation conjured up by memory; but it is one so *probable*, so *habitually* conjured up when we have just this combination of optical experiences, that it partakes of the invincible freshness of reality, and seems to break through that law which elsewhere condemns reproductive processes to being so much fainter than sensations.

Once more, *these cases form an extreme. Somewhere, in the list of our imaginations of absent feelings, there must be found the vividest of all. These optical reproductions of real form are the vividest of all.* It is foolish to reason from cases lower in the scale, to prove that the scale can contain no such extreme cases as these; and particularly foolish since we can definitely see why these imaginations ought to be more vivid than any others, whenever they recall the forms of habitual and probable things. These latter, by incessantly repeated presence and reproduction, will plough deep grooves in the nervous system. There will be developed, to correspond to them, paths of least resistance, of unstable equilibrium, liable to become active in their totality when any point is touched off. Even when the objective stimulus is imperfect, we shall still *see* the full convexity of a human face, the correct inclination of an angle or sweep of a curve, or the distance of two lines. Our mind will be like a polyhedron, whose facets are

the attitudes of perception in which it can most easily rest. These are worn upon it by *habitual* objects, and from one of these it can pass only by tumbling over into another.^[250]

Hering has well accounted for the sensationally vivid character of these habitually reproduced forms. He says, after reminding us that every visual sensation is correlated to a physical process in the nervous apparatus:

"If this psycho-physical process is aroused, as usually happens, by light-rays impinging on the retina, its form depends not only on the nature of these rays, but on the constitution of the entire nervous apparatus which is connected with the organ of vision, and on the *state* in which it finds itself. The same stimulus may excite widely different sensations according to this state.

"The constitution of the nervous apparatus depends naturally in part upon innate predisposition; but the *ensemble* of effects wrought by stimuli upon it in the course of life, whether these come through the eyes or from elsewhere, is a co-factor of its development. To express it otherwise, involuntary and voluntary experience and exercise assist in determining the material structure of the nervous organ of vision, and hence the ways in which it may react on a retinal image as an outward stimulus. That experience and exercise should be possible at all in vision is a consequence of the reproductive power, or memory, of its nerve-substance. Every particular activity of the organ makes it more suited to a repetition of the *same*; ever slighter touches are required to make the repetition occur. The organ habituates itself to the repeated activity....

"Suppose now that, in the first experience of a complex sensation produced by a particular retinal image, certain portions were made the special objects of attention. In a repetition of the sensible experience it will happen that notwithstanding the identity of the outward stimulus these portions will be more easily and strongly reproduced; and when this happens a hundred times the inequality with which the various constituents of the complex sensation appeal to consciousness grows ever greater.

"Now in the present state of our knowledge we cannot assert that in both the first and the last occurrence of the retinal image in question the same *pure sensation* is provoked, but that the mind *interprets* it differently the last time in consequence of experience; for the only *given* things we know are on the one hand the retinal image which is both times the same, and on the other the mental percept which is both times different; of a third thing, such as a pure sensation, interpolated between image and percept, we know nothing. We ought, therefore, if we wish to avoid hypotheses, simply to say that the nervous apparatus reacts the last time differently from the first, and gives us in consequence a different group of sensations.

"But not only by repetition of the same retinal image, but by that of similar ones, will the law obtain. Portions of the image common to the successive experiences will awaken, as it were, a stronger echo in the nervous apparatus than other portions. Hence it results that *reproduction is usually elective*: the more strongly reverberating parts of the picture yield stronger feelings than the rest. This may result in the latter being quite overlooked and, as it were, eliminated from perception. It may even come to pass that instead of these parts eliminated by election a feeling of entirely different elements comes to consciousness-elements not objectively contained in the stimulus. A group of sensations, namely, for which a strong tendency to reproduction has become, by frequent repetition, ingrained in the nervous system will easily revive as a *whole* when, not its whole retinal image, but only an essential part thereof, returns. In this case we get some sensations to which no adequate stimulus exists in the retinal image, and which owe their being solely to the reproductive power of the nervous apparatus. This is *complementary (ergänzende) reproduction*.

"Thus a few points and disconnected strokes are sufficient to make us see a human face, and without specially directed attention we fail to note that we see much that really is not drawn on the paper. Attention will show that the outlines were deficient in spots where we thought them complete.... The portions of the percept supplied by complementary reproduction depend, however, just as much as its other portions, on the reaction of the nervous apparatus upon the

retinal image, indirect though this reaction may, in the case of the supplied portions, be. And so long as they are present, we have a perfect right to call them sensations, for they differ in no wise from such sensations as correspond to an actual stimulus in the retina. Often, however, they are not persistent; many of them may be expelled by more close observation, but this is not proved to be the case with all.... In vision with one eye ... the distribution of parts within the third dimension is essentially the work of this complementary reproduction, i.e. of former experience.... When a certain way of localizing a particular group of sensations has become with us a second nature, our better knowledge, our judgment, our logic, are of no avail.... Things actually diverse may give similar or almost identical retinal images; e.g., an object extended in three dimensions, and its flat perspective picture. In such cases it often depends on small accidents, and especially on our will, whether the one or the other group of sensations shall be excited.... We can see a relief hollow, as a mould, or *vice versa*; for a relief illuminated from the left can look just like its mould illuminated from the right. Reflecting upon this, one may infer from the direction of the shadows that one has a relief before one, and the idea of the relief will guide the nerve-processes into the right path, so that *the feeling* of the relief is suddenly aroused.... Whenever the retinal image is of such a nature that two diverse modes of reaction on the part of the nervous apparatus are, so to speak, equally, or nearly equally, imminent, it must depend on small accidents whether the one or the other reaction is realized. In these cases our previous knowledge often has a decisive effect, and helps the correct perception to victory. The bare idea of the right object is itself a feeble reproduction which with the help of the proper retinal picture develops into clear and lively sensation. But if there be not already in the nervous apparatus a disposition to the production of that percept which our judgment tells us is right, our knowledge strives in vain to conjure up the feeling of it; we then know that we see something to which no reality corresponds, but we see it all the same."^[251]

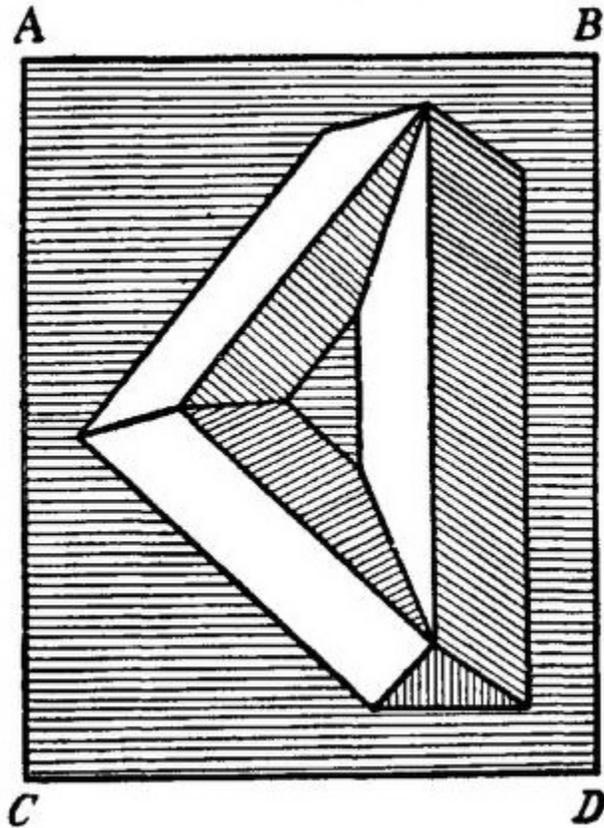


FIG. 77.

Note that no object not probable, no object which we are not incessantly practised in reproducing, can acquire this vividness in imagination. Objective corners are ever changing their angles to the eyes, spaces their apparent size, lines their distance. But by no transmutation of position in space does an objective straight line appear bent, and only in one position out of an infinity does a broken line look straight. Accordingly, it is impossible by projecting the after-image of a straight line upon two surfaces which make a solid angle with each other to give the line itself a sensible 'kink.' Look with it at the corner of your room: the after-image, which may overlap all three surfaces of the corner, still continues straight. Volkmann constructed a complicated surface of projection like that drawn in Fig. 77, but he found it impossible so to throw a straight after-image upon it as to alter its visible form.

One of the situations in which we oftenest see things is spread out on the ground before us. We are incessantly drilled in making allowance for *this* perspective, and reducing things to their real form in spite of optical foreshortening. Hence if the preceding explanations are true, we ought to

find this habit inveterate. The *lower* half of the retina, which habitually sees the *farther* half of things spread out on the ground, ought to have acquired a habit of enlarging its pictures by imagination, so as to make them more than equal to those which fall on the upper retinal surface; and this habit ought to be hard to escape from, even when both halves of the object are equidistant from the eye, as in a vertical line on paper. Delbœuf has found, accordingly, that if we try to bisect such a line we place the point of division about of its length too high.^[252]

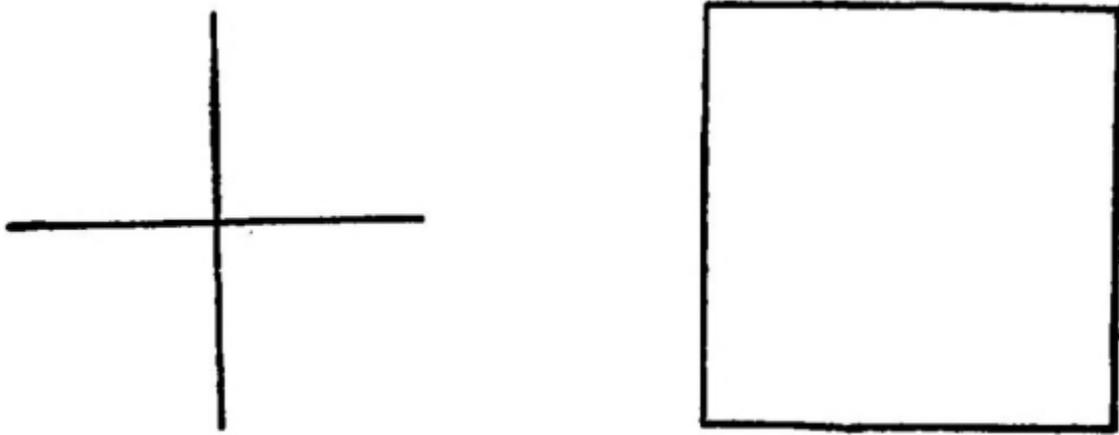


FIG. 78.

Similarly, a square cross, or a square, drawn on paper, should look higher than it is broad. And that this is actually the case, the reader may verify by a glance at Fig. 78. For analogous reasons the upper and lower halves of the letter S, or of the figure 8, hardly seem to differ. But when turned upside down, the upper half looks much the larger.^[253]

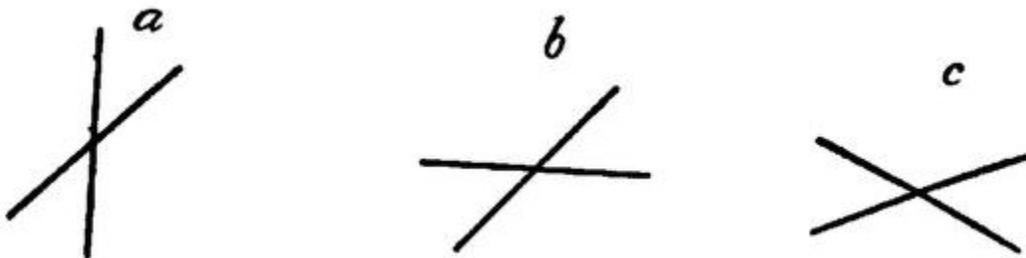


FIG. 79.

Hering has tried to explain our exaggeration of small angles in the same way. We have more to do with right angles than with any others: right angles, in fact, have an altogether unique sort of interest for the human mind. Nature almost never begets them, but we think space by means of

them and put them everywhere. Consequently obtuse and acute ones, liable always to be the images of right ones foreshortened, particularly easily revive right ones in memory. It is hard to look at such figures as *a*, *b*, *c*, in Fig. 79, without seeing them in perspective, as approximations, at least, to foreshortened rectangular forms.^[254]

At the same time the genuine sensational form of the lines before us can, in all the cases of distortion by suggested perspective, be felt correctly by a mind able to abstract from the notion of perspective altogether. Individuals differ in this abstracting power. Artistic training improves it, so that after a little while errors in vertical bisection, in estimating height relatively to breadth, etc., become impossible. In other words, we learn to take the optical sensation before us *pure*.^[255]

We may then sum up our study of illusions by saying that they in no wise undermine our view that every spatial determination of things is originally given in the shape of a sensation of the eyes. They only show how very potent certain imagined sensations of the eyes may become.

These sensations, so far as they bring definite forms to the mind, appear to be retinal exclusively. The movements of the eyeballs play a great part in educating our perception, it is true; but they have nothing to do with *constituting* any one feeling of form. Their function is limited to *exciting* the various feelings of form, by tracing retinal streaks; and to *comparing* them, and *measuring* them off against each other, by applying different parts of the retinal surface to the same objective thing. Helmholtz's analysis of the facts of our '*measurement of the field of view*' is, bating a lapse or two, masterly, and seems to prove that the movements of the eye have had some part in bringing our sense of retinal equivalencies about—*equivalencies*, mind, of different retinal forms and sizes, not forms and sizes themselves. *Superposition* is the way in which the eye-movements accomplish this result. An object traces the line AB on a peripheral tract of the retina. Quickly we move the eye so that the same object traces the line *ab* on a central tract. Forthwith, to our mind, AB and *ab* are judged equivalent. But, as Helmholtz admits, the equivalence-judgment is independent of the way in which we may feel the form and length of the several retinal pictures themselves:

"The retina is like a pair of compasses, whose points we apply in succession to the ends of several lines to see whether they agree or not in length. All we need know meanwhile about the compasses is that the distance of their points remains unchanged. What that distance is, and what is the shape of the compasses, is a matter of no account."^[256]

Measurement implies a stuff to measure. Retinal sensations give the stuff; objective things form the yardstick; motion does the measuring operation; which can, of course, be well performed only where it is possible to make the same object fall on many retinal tracts. This is practically impossible where the tracts make a wide angle with each other. But there are certain directions in the field of view, certain retinal lines, along which it is particularly easy to make the image of an object slide. The object then becomes a 'ruler' for these lines, as Helmholtz puts it,^[257] making them seem straight throughout if the object looked straight to us in that part of them at which it was most distinctly seen.

But all this need of superposition shows how devoid of exact space-import the feelings of movement are *per se*. As we compare the space-value of two retinal tracts by superposing them successively upon the same objective line, so we also have to compare the space-value of objective angles and lines by superposing them on the same retinal tract. Neither procedure would be required if our eye-movements were apprehended immediately, by pure muscular feeling or innervation, for example, as distinct lengths and directions in space. To compare retinal tracts, it would then suffice simply to notice how it feels to move *any* image over them. And two objective lines could be compared as well by moving different retinal tracts along them as by laying them along the same. It would be as easy to compare non-parallel figures as it now is to judge of those which are parallel.^[258] Those which it took the same amount of movement to traverse would be equal, in whatever direction the movement occurred.

GENERAL SUMMARY.

With this we may end our long and, I fear to many readers, tediously minute survey. The facts of vision form a jungle of intricacy; and those who penetrate deeply into physiological optics will be more struck by our

omissions than by our abundance of detail. But for students who may have lost sight of the forest for the trees, I will recapitulate briefly the points of our whole argument from the beginning, and then proceed to a short historical survey, which will set them in relief.

All our sensations are positively and inexplicably extensive wholes.

The sensations contributing to *space-perception* seem exclusively to be the surface of skin, retina, and joints. 'Muscular' feelings play no appreciable part in the generation of our feelings of form, direction, etc.

The total bigness of a cutaneous or retinal feeling soon becomes subdivided by discriminative attention.

Movements assist this discrimination by reason of the peculiarly exciting quality of the sensations which stimuli moving over surfaces arouse.

Subdivisions, once discriminated, acquire definite relations of position towards each other within the total space. These 'relations' are themselves feelings of the subdivisions that intervene. When these subdivisions are not the seat of stimuli, the relations are only reproduced in imaginary form.

The various sense-spaces are, in the first instance, incoherent with each other; and primitively both they and their subdivisions are but vaguely comparable in point of bulk and form.

The *education* of our space-perception consists largely of two processes—reducing the various sense-feelings to a common *measure*, and *adding them together* into the single all-including space of the real world.

Both the measuring and the adding are performed by the aid of *things*.

The imagined aggregate of positions occupied by all the actual or possible, moving or stationary, things which we know, is our notion of 'real' space—a very incomplete and vague conception in all minds.

The *measuring* of our space-feelings against each other mainly comes about through the successive arousal of different ones by the same *thing*, by our selection of certain ones as feelings of its *real* size and shape, and by the degradation of others to the status of being merely *signs* of these.

For the successive application of the same thing to different space-giving surfaces motion is indispensable, and hence plays a great part in our space-

education, especially in that of the eye. Abstractly considered, the motion of the object over the sensitive surface would educate us quite as well as that of the surface over the object. But the self-mobility of the organ carrying the surface *accelerates* immensely the result.

In completely educated space-perception, the present sensation is usually just what Helmholtz (Physiol. Optik, p. 797) calls it, 'a sign, the interpretation of whose meaning is left to the understanding.' But the understanding is exclusively reproductive and never productive in the process; and its function is limited to the recall of previous space-sensations with which the present one has been associated and which may be judged more real than it.

Finally, this reproduction may in the case of certain visual forms be as vivid, or almost so, as actual sensation is.

The third dimension forms an original element of all our space-sensations. In the eye it is subdivided by various discriminations. The more distant subdivisions are often shut out altogether, and, in being suppressed, have the effect of diminishing the absolute space-value of the total field of view.
[259]

HISTORICAL.

Let us now close with a brief historical survey. The first achievement of note in the study of space-perception was Berkeley's theory of vision. This undertook to establish two points, first that *distance* was not a visual but a tactile form of consciousness, suggested by visual signs; secondly, that there is no one quality or 'idea' common to the sensations of touch and sight, such that prior to experience one might possibly anticipate from the look of an object anything about its felt size, shape, or position, or from the touch of it anything about its look.

In other words, that primitively chaotic or semi-chaotic condition of our various sense-spaces which we have demonstrated, was established for good by Berkeley; and he bequeathed to psychology the problem of describing the manner in which the deliverances are harmonized so as all to refer to one and the same extended world.

His disciples in Great Britain have solved this problem after Berkeley's own fashion, and to a great extent as we have done ourselves, by the ideas of the various senses suggesting each other in consequence of Association. But, either because they were intoxicated with the principle of association, or because in the number of details they lost their general bearings, they have forgotten, as a rule, to state *under what sensible form the primitive spatial experiences are found* which later became associated with so many other sensible signs. Heedless of their master Locke's precept, that the mind can frame unto itself no one new simple idea, they seem for the most part to be trying to *explain the extensive quality itself*, account for it, and evolve it, by the mere association together of feelings which originally possessed it not. They first evaporate the nature of extension by making it tantamount to mere 'coexistence,' and then they explain coexistence as being the same thing as *succession*, provided it be an extremely rapid or a reversible succession. Space-perception thus emerges without being anywhere postulated. The only things postulated are unextended feelings and time. Says Thomas Brown (lecture xxiii.): "I am inclined to reverse exactly the process commonly supposed; and instead of deriving the measure of time from extension, to derive the knowledge and original measure of extension from time." Brown and both the Mills think that retinal sensations, colors, in their primitive condition, are felt with no extension and that the latter merely becomes inseparably associated with them. John Mill says: "Whatever may be the retinal impression conveyed by a line which bounds two colors, I see no ground for thinking that by the eye alone we could acquire the conception of what we now mean when we say that one of the colors is outside [beside] the other."^[260]

Whence does the extension come which gets so inseparably associated with these non-extended colored sensations? From the 'sweep and movements' of the *eye*—from muscular feelings. But, as Prof. Bain says, if movement-feelings give us any property of things, "it would seem to be not space, but time."^[261] And John Mill says that "the idea of space is, at bottom, one of time."^[262] Space, then, is not to be found in any elementary sensation, but, in Bain's words, "as a quality, it has no other origin and no other meaning than the *association* of these different [non-spatial] motor and sensitive effects."^[263]

This phrase is mystical-sounding enough to one who understands association as *producing* nothing, but only as knitting together things already produced in separate ways. The truth is that the English Associationist school, in trying to show how much their principle can accomplish, have altogether overshot the mark and espoused a kind of theory in respect to space-perception which the general tenor of their philosophy should lead them to abhor. Really there are but three possible kinds of theory concerning space. Either (1) there is no spatial *quality* of sensation at all, and space is a mere symbol of succession; or (2) there is an *extensive quality given* immediately in certain particular sensations; or, finally, (3) there is a *quality produced* out of the inward resources of the mind, to envelop sensations which, as given originally, are not spatial, but which, on being cast into the spatial form, become united and orderly. This last is the Kantian view. Stumpf admirably designates it as the 'psychic stimulus' theory, the crude sensations being considered as goads to the mind to put forth its slumbering power.

Brown, the Mills, and Bain, amid these possibilities, seem to have gone astray like lost sheep. With the 'mental chemistry' of which the Mills speak—precisely the same thing as the 'psychical synthesis' of Wundt, which, as we shall soon see, is a principle expressly intended to do what Association can never perform—they hold the third view, but again in other places imply the first. And, between the impossibility of getting from mere association anything not contained in the sensations associated and the dislike to allow spontaneous mental productivity, they flounder in a dismal dilemma. Mr. Sully joins them there in what I must call a vague and vacillating way. Mr. Spencer of course is bound to pretend to 'evolve' all mental qualities out of antecedents different from themselves, so that we need perhaps not wonder at his refusal to accord the spatial quality to any of the several elementary sensations out of which our space-perception grows. Thus (Psychology, ii. 168, 172, 218):

"No idea of extension can arise from a *simultaneous* excitation" of a multitude of nerve-terminations like those of the skin or the retina, since this would imply a "knowledge of their relative positions"—that is, "a pre-existent idea of a special extension, which is absurd." "No relation between *successive* states of consciousness gives in itself any idea of extension." "The muscular sensations accompanying motion

are quite distinct from the notions of space and time associated with them."

Mr. Spencer none the less inveighs vociferously against the Kantian position that space is produced by the mind's own resources. And yet he nowhere denies space to be a specific affection of consciousness different from time!

Such incoherency is pitiful. The fact is that, at bottom, all these authors are really 'psychical stimulists,' or Kantists. The space they speak of is a super-sensational mental product. This position appears to me thoroughly mythological. But let us see how it is held by those who know more definitely what they mean. Schopenhauer expresses the Kantian view with more vigor and clearness than anyone else. He says:

"A man must be forsaken by all the gods to dream that the world we see outside of us, filling space in its three dimensions, moving down the inexorable stream of time, governed at each step by Causality's invariable law,—but in all this only following rules which we may prescribe for it in advance of all experience,—to dream, I say, that such a world should stand there outside of us, quite objectively real with no complicity of ours, and thereupon by a subsequent *act*, through the instrumentality of mere sensation, that it should enter our head and reconstruct a duplicate of itself as it was outside. For what a poverty-stricken thing is this mere sensation! Even in the noblest organs of sense it is nothing more than a local and specific feeling, susceptible within its kind of a few variations, but always strictly subjective and containing in itself nothing objective, nothing resembling a perception. For sensation of every sort is and remains a process in the organism itself. As such it is limited to the territory inside the skin and can never, accordingly, *per se* contain anything that lies outside the skin or outside ourselves.... Only when the Understanding ... is roused to activity and brings its sole and only form, the *law of Causality*, into play, only then does the mighty transformation take place which makes out of subjective sensation objective intuition. The Understanding, namely, grasps by means of its innate, *a priori*, ante-experiential form, the given sensation of the body as an *effect* which as such must necessarily have a *cause*. At the same time the Understanding

summons to its aid the form of the outer sense which similarly lies already preformed in the intellect (or brain), and which is Space, in order to locate that cause outside of the organism.... In this process the Understanding, as I shall soon show, takes note of the most minute peculiarities of the given sensation in order to construct in the outer space a cause which shall completely account for them. This operation of the Understanding is, however, not one that takes place discursively, reflectively, *in abstracto*, by means of words and concepts; but is intuitive and immediate.... Thus the Understanding must first create the objective world; never can the latter, already complete *in se*, simply promenade into our heads through the senses and organic apertures. For the senses yield us nothing further than the raw material which must be first elaborated into the objective conception of an orderly physical world-system by means of the aforesaid simple forms of Space, Time, and Causality.... Let me show the great chasm between sensation and perception by showing how raw the material is out of which the fair structure is upreared. Only two senses serve objective perception: touch and sight. They alone furnish the data on the basis whereof the Understanding, by the process indicated, erects the objective world.... These data in themselves are still no perception; that is the Understanding's work. If I press with my hand against the table, the sensation I receive has no analogy with the idea of the firm cohesion of the parts of this mass: only when my Understanding passes from the sensation to its cause does it create for itself a body with the properties of solidity, impenetrability, and hardness. When in the dark I lay my hand on a surface, or grasp a ball of three inches diameter, in either case the same parts of the hand receive the impression: but out of the different contraction of the hand in the two cases my Understanding constructs the form of the body whose contact caused the feeling, and confirms its construction by leading me to move my hand over the body. If one born blind handles a cubical body, the sensations of his hand are quite uniform on all sides and in all directions,—only the corners press upon a smaller part of his skin. In these sensations, as such, there is nothing whatever analogous to a cube. But from the felt resistance his Understanding infers immediately and intuitively a cause thereof, which now presents itself as a solid body; and from the movements of exploration which the

arms made whilst the feelings of the hands remained constant he constructs, in the space known to him *a priori*, the body's cubical shape. Did he not bring with him ready-made the idea of a cause and of a space, with the laws thereof, there never could arise, out of those successive feelings in his hand, the image of a cube. If we let a string run through our closed hand, we immediately construct as the cause of the friction and its duration in such an attitude of the hand, a long cylindrical body moving uniformly in one direction. But never out of the pure sensation in the hand could the idea of movement, that is, of change of position in space by means of time, arise: such a content can never lie in sensation, nor come out of it. Our Intellect, antecedently to all experience, must bear in itself the intuitions of Space and Time, and therewithal of the possibility of motion, and no less the idea of Causality, to pass from the empirically given feeling to its cause, and to construct the latter as a so moving body of the designated shape. For how great is the abyss between the mere sensation in the hand and the ideas of causality, materiality, and movement through Space, occurring in Time! The feeling in the hand, even with different contacts and positions, is something far too uniform and poor in content for it to be possible to construct out of *it* the idea of Space with its three dimensions, of the action of bodies on each other, with the properties of extension, impenetrability, cohesion, shape, hardness, softness, rest, and motion—in short, the foundations of the objective world. This is only possible through Space, Time, and Causality ... being preformed in the Intellect itself,... from whence it again follows that the perception of the external world is essentially an intellectual process, a work of the Understanding, *to which sensation furnishes merely the occasion*, and the data to be interpreted in each particular case."^[264]

I call this view mythological, because I am conscious of no such Kantian machine-shop in my mind, and feel no call to disparage the powers of poor sensation in this merciless way. I have no introspective experience of mentally producing or creating space. My space-intuitions occur not in two times but in one. There is not one moment of passive inextensive sensation, succeeded by another of active extensive perception, but the form I see is as immediately felt as the color which fills it out. That the higher parts of the mind come in, who can deny? They add and subtract, they compare and

measure, they reproduce and abstract. They inweave the space-sensations with intellectual relations; but *these* relations are the same when they obtain between the elements of the space-system as when they obtain between any of the other elements of which the world is made.

The essence of the Kantian contention is that there are not *spaces*, but *Space*—one infinite continuous *Unit*—and that our knowledge of *this* cannot be a piecemeal sensational affair, produced by summation and abstraction. To which the obvious reply is that, if any known thing bears on its front the *appearance* of piecemeal construction and abstraction, it is this very notion of the infinite unitary space of the world. It is a *notion*, if ever there was one; and no intuition. Most of us apprehend it in the barest symbolic abridgment: and if perchance we ever do try to make it more adequate, we just add one image of sensible extension to another until we are tired. Most of us are obliged to turn round and drop the thought of the space in front of us when we think of that behind. And the space represented as near to us seems more minutely subdivisible than that we think of as lying far away.

The other prominent German writers on space are also 'psychical stimulists.' Herbart, whose influence has been widest, says 'the resting eye sees no space,'^[265] and ascribes visual extension to the influence of movements combining with the non-spatial retinal feelings so as to form gradated series of the latter. A given sensation of such a series reproduces the idea of its associates in regular order, and its idea is similarly reproduced by any one of them with the order reversed. Out of the fusion of these two contrasted reproductions comes the form of space^[266]—Heaven knows how.

The obvious objection is that mere serial order is a *genus*, and space-order a very peculiar species of that *genus*; and that, if the terms of reversible series became by that fact coexistent terms in space, the musical scale, the degrees of warmth and cold, and all other ideally graded series ought to appear to us in the shape of extended corporeal aggregates,—which they notoriously do not, though we may of course *symbolize* their order by a spatial scheme. W. Volkman von Volkmar, the Herbartian, takes the bull here by the horns,

and says the musical scale *is* spatially extended, though he admits that its space does not belong to the real world.^[267] I am unacquainted with any other Herbartian so bold.

To Lotze we owe the much-used term 'local sign.' He insisted that space could not emigrate directly into the mind from without, but must be *reconstructed* by the soul; and he seemed to think that the first reconstructions of it by the soul must be super-sensational. But why sensations themselves might not be the soul's *original* spatial reconstructive acts Lotze fails to explain.

Wundt has all his life devoted himself to the elaboration of a space-theory, of which the neatest and most final expression is to be found in his *Logik* (ii. 457-60). He says:

"In the eye, space-perception has certain constant peculiarities which prove that no single optical sensation by itself possesses the extensive form, but that everywhere in our perception of space heterogeneous feelings combine. If we simply suppose that luminous sensations *per se* feel extensive, our supposition is shattered by that influence of movement in vision which is so clearly to be traced in many normal errors in the measurement of the field of view. If we assume, on the other hand, that the movements and their feelings are alone possessed of the extensive quality, we make an unjustified hypothesis, for the phenomena compel us, it is true, to accord an influence to movement, but give us no right to call the retinal sensations indifferent, for there are no visual ideas without retinal sensations. If then we wish rigorously to express the given facts, we can ascribe a spatial constitution only to *combinations* of retinal sensations with those of movement."

Thus Wundt, dividing theories into 'nativistic' and 'genetic,' calls his own a genetic theory. To distinguish it from other theories of the same class, he names it a 'theory of complex local signs.'

"It supposes two systems of local signs, whose relations—taking the eye as an example—we may think as ... the measuring of the manifold local-sign system of the retina by the simple local-sign system of the movements. In its psychological nature this is a process of associative synthesis: it consists in the fusion of both groups of sensations into a product, whose elementary components are no longer separable from each other in idea. In melting wholly away into the product which they create they become consciously undistinguishable, and the mind apprehends only their resultant, the intuition of space. Thus there obtains a certain analogy between this psychic synthesis and that chemical synthesis which out of simple bodies generates a compound that appears to our immediate perception as a homogeneous whole with new properties."

Now let no modest reader think that if this sounds obscure to him it is because he does not know the full context; and that if a wise professor like Wundt can talk so fluently and plausibly about 'combination' and 'psychic synthesis,' it must surely be because those words convey a so much greater fulness of positive meaning to the scholarly than to the unlearned mind. Really it is quite the reverse; *all* the virtue of the phrase lies in its mere sound and skin. Learning does but make one the more sensible of its inward unintelligibility. Wundt's 'theory' is the flimsiest thing in the world. It starts by an untrue assumption, and then corrects it by an unmeaning phrase. Retinal sensations *are* spatial; and were they not, no amount of 'synthesis' with equally spaceless motor sensations could intelligibly make them so. Wundt's theory is, in short, but an avowal of impotence, and an appeal to the inscrutable powers of the soul.^[268] It confesses that we cannot analyze the constitution or give the genesis of the spatial quality in consciousness. But at the same time it says the *antecedents* thereof are psychical and not cerebral facts. In calling the quality in question a *sensational* quality, our own account equally disclaimed ability to analyze it, but said its antecedents were cerebral, not psychical—in other words, that it was a *first*

psychical thing. This is merely a question of probable fact, which the reader may decide.

And now what shall be said of Helmholtz? Can I find fault with a book which, on the whole, I imagine to be one of the four or five greatest monuments of human genius in the scientific line? If truth impels I must fain try, and take the risks. It seems to me that Helmholtz's genius moves most securely when it keeps close to particular facts. At any rate, it shows least strength in purely speculative passages, which in the Optics, in spite of many beauties, seem to me fundamentally vacillating and obscure. The 'empiristic' view which Helmholtz defends is that the space-determinations we perceive are in every case products of a process of unconscious inference.^[269] The inference is similar to one from induction or analogy.^[270] We always see that form before us which *habitually* would have caused the sensation we now have.^[271] But the latter sensation can never be intrinsically spatial, or its intrinsic space-determinations would never be overcome as they are so often by the 'illusory' space-determinations it so often suggests.^[272] Since the illusory determination can be traced to a suggestion of Experience, the 'real' one must also be such a suggestion: so that *all* space intuitions are due solely to Experience.^[273] The only psychic activity required for this is the association of ideas.^[274]

But how, it may be asked, can association produce a space-quality not in the things associated? How can we by induction or analogy infer what we do not already generically know? Can 'suggestions of experience' reproduce elements which no particular experience originally contained? This is the point by which Helmholtz's 'empiristic' theory, as a *theory*, must be judged. No theory is worthy of the name which leaves such a point obscure.

Well, Helmholtz does so leave it. At one time he seems to fall back on inscrutable powers of the soul, and to range himself with the 'psychical stimulists.' He speaks of Kant as having made the essential step in the matter in distinguishing the content of experience from that form—space, course—which is given it by the peculiar faculties of the mind.^[275] But elsewhere, again,^[276] speaking of sensationalistic theories which would connect spatially determinate feelings *directly* with certain neural events, he says it is better to assume only such simple psychic activities as we *know* to exist, and gives the association of ideas as an instance of what he means. Later,^[277] he reinforces this remark by confessing that he does not see how any neural process *can* give rise without antecedent experience to a ready-made (*fertige*) perception of space. And, finally, in a single momentous sentence, he speaks of sensations of *touch* as if they might be the original material of our space-percepts—which thus, from the optical point of view, 'may be assumed as *given*.'^[278]

Of course the eye-man has a right to fall back on the skin-man for help at a pinch. But doesn't this mean that he is a mere eye-man and not a complete psychologist? In other words, Helmholtz's Optics and the 'empiristic theory' therein professed must not be understood as attempts at answering the *general* question of how space-consciousness enters the mind. They simply deny that it enters with the first optical sensations.^[279] Our own account has affirmed stoutly that it enters *then*; but no more than Helmholtz have we pretended to show *why*. Who calls a thing a first sensation admits he has no theory of its production. Helmholtz, though all the while without an articulate theory, makes the world think he has one. He beautifully traces the immense part which reproductive processes play in our vision of space, and never—except in that one pitiful little sentence about touch—does he tell us just what it is they reproduce. He limits himself to denying that they reproduce originals of a visual sort. And so difficult is the subject, and so magically do catch-words work on the popular-scientist ear, that most likely, had he written 'physiological' instead of 'nativistic,' and 'spiritualistic' instead of 'empiristic' (which synonyms Hering suggests), numbers of his present empirical evolutionary followers would fail to find in his teaching anything worthy of praise. But since he wrote otherwise, they hurrah for him as a sort of second Locke, dealing another death-blow at the old

bugaboo of 'innate ideas.' His 'nativistic' adversary Hering they probably imagine—Heaven save the mark!—to be a scholastic in modern disguise.

After Wundt and Helmholtz, the most important anti-sensationalist space-philosopher in Germany is Professor Lipps, whose deduction of space from an order of non-spatial differences, continuous yet separate, is a wonderful piece of subtlety and logic. And yet he has to confess that continuous differences form in the first instance only a logical series, which *need* not appear spatial, and that wherever it does so appear, this must be accounted a 'fact,' due merely 'to the nature of the soul.'^[280]

Lipps, and almost all the anti-sensationalist theorists except Helmholtz, seem guilty of that confusion which Mr. Shadworth Hodgson has done so much to clear away, viz., the confounding the analysis of an idea with the means of its production. Lipps, for example, finds that every space we think of can be broken up into positions, and concludes that in some undefined way the several positions must have pre-existed in thought before the aggregate space could have appeared to perception. Similarly Mr. Spencer, defining extension as an 'aggregate of relations of coexistent position,' says "every cognition of magnitude is a cognition of relations of position,"^[281] and "no idea of extension can arise from the simultaneous excitation" of many nerves "unless there is a knowledge of their relative positions."^[282] Just so Prof. Bain insists that the very *meaning* of space is scope for movement,^[283] and that therefore distance and magnitude *can* be no original attributes of the eye's sensibility. Similarly because movement is analyzable into positions occupied at successive moments by the mover, philosophers (e.g. Schopenhauer, as quoted above) have repeatedly denied the possibility of *its* being an immediate sensation. We have, however, seen that it is the most immediate of all our space-sensations. Because it can only occur in a definite direction the impossibility of perceiving it without perceiving its direction has been decreed—a decree which the simplest experiment overthrows.^[284] It is a case of what I have called the 'psychologist's fallacy': mere acquaintance with space is treated as tantamount to every sort of knowledge about it, the conditions of the latter are demanded of the former state of mind, and all sorts of mythological

processes are brought in to help.^[285] As well might one say that because the world consists of all its parts, therefore we can only apprehend it at all by having unconsciously summed these up in our head. It is the old idea of our actual knowledge being drawn out from a pre-existent potentiality, an idea which, whatever worth it may metaphysically possess, does no good in psychology.

My own sensationalistic account has derived most aid and comfort from the writings of Hering, A. W. Volkmann, Stumpf, Le Conte, and Schön. All these authors allow ample scope to that Experience which Berkeley's genius saw to be a present factor in all our visual acts. But they give Experience some grist to grind, which the *soi-distant* 'empiristic' school forgets to do. Stumpf seems to me the most philosophical and profound of all these writers; and I owe him much. I should doubtless have owed almost as much to Mr. James Ward, had his article on Psychology in the Encyclopædia Britannica appeared before my own thoughts were written down. The literature of the question is in all languages very voluminous. I content myself with referring to the bibliography in Helmholtz's and Aubert's works on Physiological Optics for the visual part of the subject, and with naming in a note the ablest works in the English tongue which have treated of the subject in a *general* way.^[286]

[140] Reprinted, with considerable revision, from 'Mind' for 1887.

[141] Prof. Jastrow has found that invariably we tend to *underestimate* the amount of our skin which may be stimulated by contact with an object when we express it in terms of visual space; that is, when asked to mark on paper the extent of skin affected, we always draw it much too small. This shows that the eye gets as much space feeling from the smaller line as the skin gets from the larger one. Cf. Jastrow: Mind, xi. 546-7; American Journal of Psychology, iii. 53.

[142] Amongst sounds the graver ones seem the most extensive. Stumpf gives three reasons for this: 1) association with bigger causes; 2) wider reverberation of the hand and body when grave notes are sung; 3) audibility at a greater distance. He thinks that these three reasons dispense us from supposing an immanent extensity in the sensation of sound as such. See his remarks in the Tonpsychologie, i. 207-211.

[143] Encyclopædia Britannica, 9th Edition, article Psychology, pp. 46, 58.

[144] Philosophical Transactions (1841).

[145] Hermann's Handb. d. Physiol., Bd. iii. 1, §. 575.

[146] *Loc. cit.* §. 572.

[147] Elemente der Psychophysik, ii. 475-6.

[148] See Foster's Text-book of Physiology, bk. iii. c. vi. § 2.

[149] Fechner, who was ignorant of the but lately discovered function of the semi-circular canals, gives a different explanation of the organic seat of these feelings. They are probably highly composite. With me, actual movements in the eyes play a considerable part in them, though I am hardly conscious of the peculiar feelings in the scalp which Fechner goes on to describe thus: "The feeling of strained attention in the different sense-organs seems to be only a muscular one produced in using these various organs by setting in motion, by a sort of reflex action, the set of muscles which belong to them. One can ask, then, with what particular muscular contraction the sense of strained attention in the effort to recall something is associated? On this question my own feeling gives me a decided answer; it comes to me distinctly not as a sensation of tension in the inside of the head, but as a feeling of strain and contraction in the scalp, with a pressure from outwards in over the whole cranium, undoubtedly caused by a contraction of the muscles of the scalp. This harmonizes very well with the expressions, *sich den Kopf zerbrechen*, *den Kopf zusammennehmen*. In a former illness, when I could not endure the slightest effort after continuous thought, and had no theoretical bias on this question, the muscles of the scalp, especially those of the back-head, assumed a fairly morbid degree of sensibility whenever I tried to think." (Elem. der Psychophysik, ii, 490-91.)

[150] That the sensation in question is one of tactile rather than of acoustic sensibility would seem proved by the fact that a medical friend of the writer, both of whose *membranæ tympani* are quite normal, but one of whose ears is almost totally deaf, feels the presence and withdrawal of objects as well at one ear as at the other.

[151] The skin seems to obey a different law from the eye here. If a given retinal tract be excited, first by a series of points, and next by the two extreme points, with the interval between them unexcited, this interval will seem considerably less in the second case than it seemed in the first. In the skin the unexcited interval feels the larger. The reader may easily verify the facts in this case by taking a visiting-card, cutting one edge of it into a saw-tooth pattern, and from the opposite edge cutting out all but the two corners, and then comparing the feelings aroused by the two edges when held against the skin.

[152] Classen, Physiologie des Gesichtssinnes, p. 114; see also A. Riehl, Der Philosophische Kriticismus, ii. p. 149.

[153] It is worth while at this point to call attention with some emphasis to the fact that, though the anatomical condition of the feeling *resembles* the feeling itself, such resemblance cannot be taken by our understanding to explain *why* the feeling should be just what it is. We hear it untiringly reiterated by materialists and spiritualists alike that we can see no possible inward reason why a certain brain-process should produce the feeling of redness and another of anger: the one process is no more red than the other is angry, and the coupling of process and feeling is, as far as our understanding goes, a juxtaposition pure and simple. But in the matter of *spatial* feeling, where the retinal patch that produces a triangle in the mind is itself a triangle, etc., it looks at first sight as if the sensation might be a direct cognition of its own neural condition. Were this true, however, our sensation should be one of *multitude* rather than of continuous extent; for the condition is *number* of optical nerve-termini, and even this is only a remote condition and not an immediate condition. The immediate condition of the feeling is not the process in the retina, but the process in the brain; and the process in the brain may, for aught we know, be as unlike a triangle,—nay, it probably is so,—as it is unlike redness or rage. It is simply a *coincidence* that in the case of space one of the organic conditions, viz., the triangle impressed on the skin or the retina, should lead to a representation in the mind of the subject observed similar to that which it produces in the psychological observer. In no other kind of case is the coincidence found. Even should we admit that we cognize triangles in space because of our immediate cognition of the triangular shape of our excited group of nerve-tips, the matter would

hardly be more transparent, for the mystery would still remain, why are we so much better cognizant of triangles on our finger-tips than on the nerve-tips of our back, on our eye than on our ear, and on any of these parts than in our brain? Thos. Brown very rightly rejects the notion of explaining the shape of the space perceived by the shape of the 'nervous expansion affected.' "If this alone were necessary, we should have square inches and half inches, and various other forms, rectilinear and curvilinear, of fragrance and sound." (Lectures, XXII.)

[154] Musical tones, e.g., have an order of quality independent either of their space- or time-order. Music comes from the time-order of the notes upsetting their quality-order. In general, if *a b c d e f g h i j k*, etc., stand for an arrangement of feelings in the order of their quality, they may assume *any* space-order or time-order, as *d e f a h g*, etc., and still the order of quality will remain fixed and unchanged.

[155] The whole science of geometry may be said to owe its being to the exorbitant interest which the human mind takes in *lines*. We cut space up in every direction in order to manufacture them.

[156] Kant was, I believe, the first to call attention to this last order of facts. After pointing out that two opposite spherical triangles, two gloves of a pair, two spirals wound in contrary directions, have identical inward determinations, that is, have their parts defined with relation *to each other* by the same law, and so must be *conceived* as identical, he showed that the impossibility of their mutual superposition obliges us to assign to each figure of a symmetrical pair a peculiar difference of its own which can only consist in an *outward* determination or relation of its parts, no longer to each other, but to the whole of an objectively outlying space with its points of the compass given absolutely. This *inconceivable* difference is perceived only "through the relation to right and left, which is a matter of immediate intuition." In these last words (*welches unmittelbar auf Anschauung geht*—Prolegomena, § 12) Kant expresses all that we have meant by speaking of up and down, right and left, as *sensations*. He is wrong, however, in invoking relation to extrinsic total space as essential to the existence of these contrasts in figures. Relation to our own body is enough.

[157] In the eyes of many it will have seemed strange to call a relation a mere line, and a line a mere sensation. We may easily learn a great deal *about* any relation, say that between two points: we may divide the line which joins these, and distinguish it, and classify it, and find out *its* relations by drawing or representing new lines, and so on. But all this further industry has naught to do with our *acquaintance* with the relation itself, in its first intention. So cognized, the relation *is* the line and nothing more. It would indeed be fair to call it something less; and in fact it is easy to understand how most of us come to feel as if the line were a much grosser thing than the relation. The line is broad or narrow, blue or red, made by this object or by that alternately, in the course of our experience; it is therefore independent of any one of these accidents; and so, from viewing it as no one of *such* sensible qualities, we may end by thinking of it as something which cannot be defined except as the negation of all sensible quality whatever, and which needs to be put *into* the sensations by a mysterious act of 'relating thought.'

Another reason why we get to feel as if a space-relation must be something other than the mere feeling of a line or angle is that between two positions we can potentially make any number of lines and angles, or find, to suit our purposes, endlessly numerous relations. The sense of this indefinite potentiality cleaves to our words when we speak in a general way of 'relations of place,' and misleads us into supposing that not even any single one of them can be exhaustively equated by a single angle or a single line.

[158] This often happens when the warm and cold points, or the round and pointed ones, are applied to the skin within the limits of a single 'Empfindungskreis.'

[159] Vierordt, Grundriss der Physiologie, 5te Auflage (1877), pp. 326, 436.

[160] Vorlesungen üb. Menschen- u. Thierseele (Leipzig, 1863), i. 214. See also Ladd's Physiological Psychology, pp. 396-8, and compare the account by G. Stanley Hall (Mind, x. 571) of the sensations produced by moving a blunt point lightly over the skin. Points of cutting pain, quivering, thrilling, whirling, tickling, scratching, and acceleration, alternated with each other along the surface.

[161] Of the anatomical and physiological conditions of these facts we know as yet but little, and that little need not here be discussed. Two principal hypotheses have been invoked in the case of the retina. Wundt (Menschen- u. Thierseele, i. 214) called attention to the changes of color-sensibility which the retina displays as the image of the colored object passes from the fovea to the periphery. The color alters and becomes darker, and the change is more rapid in certain directions than in others. This alteration in general, however, is one of which, *as such*, we are wholly unconscious. We see the sky as bright blue all over, the modifications of the blue sensation being interpreted by us, not as differences in the objective color, but as distinctions in its locality. Lotze (Medizinische Psychologie, 333, 355), on the other hand, has pointed out the peculiar tendency which each particular point of the retina has to call forth that movement of the eyeball which will carry the image of the exciting object from the point in question to the *fovea*. With each separate tendency to movement (as with each actual movement) we may suppose a peculiar modification of sensibility to be conjoined. This modification would constitute the peculiar local tingeing of the image by each point. See also Sully's Psychology, pp. 118-121. Prof. B. Erdman has quite lately (Vierteljahrsschrift f. wiss. Phil., x. 324-9) denied the existence of all evidence for such immanent *qualia* of feeling characterizing each locality. Acute as his remarks are, they quite fail to convince me. On the skin the *qualia* are evident, I should say. Where, as on the retina, they are less so (Kries and Auerbach), this may well be a mere difficulty of discrimination not yet educated to the analysis.

[162] 1852, p. 331.

[163] Maybe the localization of intracranial pain is itself due to such association as this of local signs with each other, rather than to their qualitative similarity in neighboring parts (*supra*, p. 19); though it is conceivable that association and similarity itself should here have one and the same neural basis. If we suppose the sensory nerves from those parts of the body beneath any patch of skin to terminate in the same sensorial brain-tract as those from the skin itself, and if the excitement of any one fibre tends to irradiate through the whole of that tract, the feelings of all fibres going to that tract would presumably both have a similar intrinsic quality, and at the same time tend each to arouse the other. Since the same nerve-trunk in most cases supplies the skin and the parts beneath, the anatomical hypothesis presents nothing improbable.

[164] Unless, indeed, the foot happen to be spontaneously tingling or something of the sort at the moment. The whole surface of the body is always in a state of semi-conscious irritation which needs only the emphasis of attention, or of some accidental inward irritation, to become strong at any point.

[165] It is true that the inside of the forearm, though its discriminative sensibility is often less than that of the outside, usually rises very prominently into consciousness when the latter is touched. Its *aesthetic* sensibility to contact is a good deal finer. We enjoy stroking it from the extensor to the flexor surface around the ulnar side more than in the reverse direction. Pronating movements give rise to contacts in this order, and are frequently indulged in when the back of the forearm feels an object against it.

[166] These facts were first noticed by Wundt: see his Beiträge, p. 140, 202. See also Lamansky, Pflüger's Archiv, xi. 418.

[167] So far all has been plain sailing, but our course begins to be so tortuous when we descend into minuter detail that I will treat of the more precise determination of locality in a long note. When *P* recalls an ideal line leading to the fovea the line is felt in its entirety and but vaguely; whilst *P*, which we supposed to be a single star of actual light, stands out in strong distinction from it. The ground of

the distinction between *P* and the ideal line which it terminates is manifest—*P* being vivid while the line is faint; *but why should P hold the particular position it does, at the end of the line, rather than anywhere else—for example, in its middle?* That seems something not at all manifest.

To clear up our thoughts about this latter mystery, let us take the case of an actual line of light, none of whose parts is ideal. The feeling of the line is produced, as we know, when a multitude of retinal points are excited together, each of which *when excited separately* would give rise to *one* of the feelings called local signs. Each of these signs is the feeling of a small space. From their simultaneous arousal we might well suppose a feeling of larger space to result. But why is it necessary that *in* this larger spaciousness the sign *a* should appear always at one end of the line, *z* at the other, and *m* in the middle? For though the line be a unitary streak of light, its several constituent points can nevertheless break out from it, and become alive, each for itself, under the selective eye of attention.

The uncritical reader, giving his first careless glance at the subject, will say that there is no mystery in this, and that 'of course' local signs must appear alongside of each other, each in its own place;—there is no other way possible. But the more philosophic student, whose business it is to discover difficulties quite as much as to get rid of them, will reflect that it is conceivable that the partial factors might fuse into a larger space, and yet not each be located within it any more than a voice is *located* in a chorus. He will wonder how, after combining into the line, the points *can* become severally alive again: the separate puffs of a 'sirene' no longer strike the ear after they have fused into a certain pitch of sound. He will recall the fact that when, after looking at things with one eye closed, we double, by opening the other eye, the number of retinal points affected, the new retinal sensations do not as a rule appear *alongside* of the old ones and additional to them, but merely make the old ones seem larger and nearer. Why should the affection of new points on the *same* retina have so different a result? In fact, he will see no sort of logical connection between (1) the original separate local signs, (2) the line as a unit, (3) the line with the points discriminated in it, and (4) the various nerve-processes which subserve all these different things. He will suspect our local sign of being a very slippery and ambiguous sort of creature. Positionless at first, it no sooner appears in the midst of a gang of companions than it is found maintaining the strictest position of its own, and assigning place to each of its associates. How is this possible? Must we accept what we rejected a while ago as absurd, and admit the points each to have position *in se*? Or must we suspect that our whole construction has been fallacious, and that we have tried to conjure up, out of association, qualities which the associates never contained?

There is no doubt a real difficulty here; and the shortest way of dealing with it would be to confess it insoluble and ultimate. Even if position be not an intrinsic character of any one of those sensations we have called local signs, we must still admit that there is *something about* every one of them that stands for the potentiality of position, and is the *ground* why the local sign, when it gets placed at all, gets placed *here* rather than *there*. If this 'something' be interpreted as a physiological something, as a mere nerve-process, it is easy to say in a blank way that when it is excited alone, it is an 'ultimate fact' (1) that a positionless spot will appear; that when it is excited together with other similar processes, but *without* the process of discriminative attention, it is another 'ultimate fact' (2) that a unitary line will come; and that the final 'ultimate fact' (3) is that, when the nerve-process is excited *in combination with* that other process which subserves the feeling of attention, what results will be the line with the local sign inside of it determined to a particular place. Thus we should escape the responsibility of explaining, by falling back on the everlasting inscrutability of the psycho-neural nexus. The moment we call the ground of localization physiological, we need only point out *how*, in those cases in which localization occurs, the physiological process *differs* from those in which it does not, to have done all we can possibly do in the matter. This would be unexceptionable logic, and with it we might let the matter drop, satisfied that there was no self-contradiction in it, but only the

universal psychological puzzle of how a new mode of consciousness emerges whenever a fundamentally new mode of nervous action occurs.

But, blameless as such tactics would logically be on our part, let us see whether we cannot push our theoretic insight a little farther. It seems to me we can. We cannot, it is true, give a reason why the line we feel when process (2) awakens should have its own peculiar shape; nor can we explain the essence of the process of discriminative attention. But we can see why, if the brute facts be admitted that a line may have one of its parts singled out by attention at all, and that that part may appear in relation to other parts at all, the relation must be *in the line itself*,—for the line and the parts are the only things supposed to be in consciousness. And we can furthermore suggest a reason why parts appearing thus in relation to each other in a line should fall into an immutable order, and each within that order keep its characteristic place.

If a lot of such local signs all have any quality which evenly augments as we pass from one to the other, we can arrange them in an ideal serial order, in which any one local sign must lie below those with more, above those with less, of the quality in question. It must divide the series into two parts,—unless indeed it have a maximum or minimum of the quality, when it either begins or ends it.

Such an ideal series of local signs in the mind is, however, not yet identical with the feeling of a line in space. Touch a dozen points on the skin *successively*, and there seems no necessary reason why the notion of a definite line should emerge, even though we be strongly aware of a gradation of quality among the touches. We may of course symbolically arrange them in a line in our thought, but we can always distinguish between a line symbolically thought and a line directly felt.

But note now the peculiarity of the nerve-processes of all these local signs: though they may give no line when excited successively, when excited *together* they do give the actual sensation of a line in space. The sum of them is the neural process of that line; the sum of their feelings is the feeling of that line; and if we begin to single out particular points from the line, and notice them by their rank, it is impossible to see how this rank can *appear* except as an actual fixed space-position sensibly felt as a bit of the total line. The scale itself appearing as a line, rank in it must appear as a definite part of the line. If the seven notes of an octave, when heard together, appeared to the sense of hearing as an outspread *line* of sound—which it is needless to say they do not—why then no one note could be discriminated without being localized, according to its pitch, *in* the line, either as one of its extremities or as some part between.

But not alone the gradation of their quality arranges the local-sign feelings in a scale. Our *movements* arrange them also in a time-scale. Whenever a stimulus passes from point *a* of the skin or retina to point *f*, it awakens the local-sign feelings in the perfectly definite time-order *abcdef*. It cannot excite *f* until *cde* have been successively aroused. The feeling *c* sometimes is preceded by *ab*, sometimes followed by *ba*, according to the movement's direction; the result of it all being that we never feel either *a*, *c*, or *f*, without there clinging to it faint reverberations of the various time-orders of transition in which, throughout past experience, it has been aroused. To the local sign *a* there clings the tinge or tone, the penumbra or fringe, of the transition *bcd*. To *f*, to *c*, there cling quite different tones. Once admit the principle that a feeling may be tinged by the reproductive consciousness of an habitual transition, even when the transition is not made, and it seems entirely natural to admit that, if the transition be habitually in the order *abcdef*, and if *a*, *c*, and *f* be felt separately at all, *a* will be felt with an essential *earliness*, *f* with an essential *lateness*, and that *c* will fall between. Thus those psychologists who set little store by local signs and great store by movements in explaining space-perception, would have a perfectly definite time-order, due to motion, by which to account for the definite order of positions that appears when sensitive spots are excited all at once. Without, however, the preliminary admission of the 'ultimate fact' that this collective excitement shall feel like a *line* and nothing else, it can never be explained why the new order should needs be an order of *positions*, and not of merely ideal serial rank. We shall hereafter have any amount of opportunity to

observe how thoroughgoing is the participation of motion in all our spatial measurements. Whether the local signs have their respective qualities evenly graduated or not, the feelings of transition must be set down as among the *veræ causæ* in localization. But the gradation of the local signs is hardly to be doubted; so we may believe ourselves really to possess two sets of reasons for localizing any point we may happen to distinguish from out the midst of any line or any larger space.

[168] M. Binet (Revue Philosophique, Sept. 1880, page 291) says we judge them locally different as soon as their sensations differ enough for us to distinguish them as qualitatively different when successively excited. This is not strictly true. Skin-sensations, different enough to be discriminated when *successive*, may still fuse locally if excited both at once.

[169] It may, however, be said that even in the tongue there is a determination of bitter flavors to the back and of acids to the front edge of the organ. Spices likewise affect its sides and front, and a taste like that of alum localizes itself, by its styptic effect on the portion of mucous membrane, which it immediately touches, more sharply than roast pork, for example, which stimulates all parts alike. The pork, therefore, tastes more spacious than the alum or the pepper. In the nose, too, certain smells, of which vinegar may be taken as the type, seem less spatially extended than heavy, suffocating odors, like musk. The reason of this appears to be that the former inhibit inspiration by their sharpness, whilst the latter are drawn into the lungs, and thus excite an objectively larger surface. The ascription of height and depth to certain notes seems due, not to any localization of the sounds, but to the fact that a feeling of vibration in the chest and tension in the gullet accompanies the singing of a bass note, whilst, when we sing high, the palatine mucous membrane is drawn upon by the muscles which move the larynx, and awakens a feeling in the roof of the mouth.

The only real objection to the law of partial stimulation laid down in the text is one that might be drawn from the organ of hearing; for, according to modern theories, the cochlea may have its separate nerve-termini exclusively excited by sounds of differing pitch, and yet the sounds seem all to fill a common space, and not necessarily to be arranged alongside of each other. At most the high note is felt as a thinner, brighter streak against a darker background. In an article on Space, published in the Journal of Speculative Philosophy for January, 1879, I ventured to suggest that possibly the auditory nerve termini might be "excited all at once by sounds of any pitch, as the whole retina would be by every luminous point if there were no dioptric apparatus affixed." And I added: "Notwithstanding the brilliant conjectures of the last few years which assign different acoustic end-organs to different rates of air-wave, we are still greatly in the dark about the subject; and I, for my part, would much more confidently reject a theory of hearing which violated the principles advanced in this article than give up those principles for the sake of any hypothesis hitherto published about either organs of Corti or basilar membrane." Professor Rutherford's theory of hearing, advanced at the meeting of the British Association for 1886, already furnishes an alternative view which would make hearing present no exception to the space-theory I defend and which, whether destined to be proved true or false, ought, at any rate to make us feel that the Helmholtzian theory is probably not the last word in the physiology of hearing. Stepano, ff. (Hermann und Schwalbe's Jahresbericht, xv. 404, Literature 1886) reports a case in which more than the upper half of one cochlea was lost without any such deafness to deep notes on that side as Helmholtz's theory would require.

[170] Donaldson, in Mind, x. 399, 577; Goldscheider, in Archiv f. (Anat. u.) Physiologie; Blix, in Zeitschrift für Biologie. A good résumé may be found in Ladd's Physiol. Psychology, part ii. chap. iv. §§ 21-23.

[171] I tried on nine or ten people, making numerous observations on each, what difference it made in the discrimination of two points to have them alike or unlike. The points chosen were (1) two large needle-heads, (2) two screw-heads, and (3) a needle-head and a screw-head. The distance of the screw-heads was measured from their centres. I found that when the points gave diverse qualities of feeling (as in 3), this facilitated the discrimination, but much less strongly than I expected. The

difference, in fact, would often not be perceptible twenty times running. When, however, one of the points was endowed with a rotary movement, the other remaining still, the doubleness of the points became much more evident than before. To observe this I took an ordinary pair of compasses with one point blunt, and the movable leg replaced by a metallic rod which could, at any moment, be made to rotate *in situ* by a dentist's drilling-machine, to which it was attached. The compass had then its points applied to the skin at such a distance apart as to be felt as one impression. Suddenly rotating the drill-apparatus then almost always made them seem as two.

[172] This is only another example of what I call 'the psychologist's fallacy'—thinking that the mind he is studying must necessarily be conscious of the object after the fashion in which the psychologist himself is conscious of it.

[173] Sitzb. der. k. Akad. Wien, Bd. lxxii., Abth. 8 (1875).

[174] Zeitschrift für Biologie, xii. 226 (1876).

[175] Vierteljahrsh. für wiss. Philos., ii. 377.

[176] Exner tries to show that the structure of the faceted eye of articulates adapts it for perceiving motions almost exclusively.

[177] Schneider tries to explain why a sensory surface is so much more excited when its impression moves. It has long since been noticed how much more acute is discrimination of successive than of simultaneous differences. But in the case of a moving impression, say on the retina, we have a summation of both sorts of difference; whereof the natural effect must be to produce the most perfect discrimination of all.



FIG. 53.

In the left-hand figure let the dark spot B move, for example, from right to left. At the outset there is the simultaneous contrast of black and white in B and A. When the motion has occurred so that the right-hand figure is produced, the same contrast remains, the black and the white having changed places. But in addition to it there is a double successive contrast, first in A, which, a moment ago white, has now become black; and second in B, which, a moment ago black, has now become white. If we make each single feeling of contrast = 1 (a supposition far too favorable to the state of rest), the sum of contrasts in the case of motion will be 3, as against 1 in the state of rest. That is, our attention will be called by a treble force to the difference of color, provided the color begin to move.—(Cf. also Fleischl, Physiologische Optische Notizen, 2te Mittheilung, Wiener Sitzungsberichte, 1882.)

[178] Brown, Bain, J. S. Mill, and in a modified manner Wundt, Helmholtz, Sully, etc.

[179] M. Ch. Dunan, in his forcibly written essay 'l'Espace Visuel et l'Espace Tactile' in the *Revue Philosophique* for 1888, endeavors to prove that surfaces alone give no perception of extent, by citing the way in which the blind go to work to gain an idea of an object's shape. If surfaces were the percipient organ, he says, "both the seeing and the blind ought to gain an exact idea of the size (and shape) of an object by merely laying their hand flat upon it (provided of course that it were smaller than the hand), and this because of their direct appreciation of the amount of tactile surface affected, and with no recourse to the muscular sense.... But the fact is that a person born blind never proceeds in this way to measure objective surfaces. The only means which he has of getting at the size of a body is that of running his finger along the lines by which it is bounded. For instance, if you put into the hands of one born blind a book whose dimensions are unknown to him, he will begin by resting it against his chest so as to hold it horizontal; then, bringing his two hands together at the middle of the edge opposite to the one against his body, he will draw them asunder till they reach the ends of the edge in question; and then, and not till then, will he be able to say what the length of the object is" (vol. xxv. p. 148). I think that anyone who will try to appreciate the size and shape of an object by simply 'laying his hand flat upon it' will find that the great obstacle is that he *feels the contours* so imperfectly. The moment, however, the hands move, the contours are emphatically and distinctly felt. All perception of shape and size is perception of contours, and first of all these must be made *sharp*. Motion does this; and the impulse to move our organs in perception is primarily due to the craving which we feel to get our surface-sensations sharp. When it comes to the naming and measuring of objects in terms of some common standard we shall see presently how movements help also; but no more in this case than the other do they help, because the quality of extension itself is contributed by the 'muscular sense.'

[180] Fechner describes (*Psychophysik*, i. 132) a 'method of equivalents' for measuring the sensibility of the skin. Two compasses are used, one on the part A, another on the part B, of the surface. The points on B must be adjusted so that their distance apart appears equal to that between the points on A. With the place A constant, the second pair of points must be varied a great deal for every change in the place B, though for the same A and B the relation of the two compasses is remarkably constant, and continues unaltered for months, provided but few experiments are made on each day. If, however, we practise daily their difference grows less, in accordance with the law given in the text.

[181] Prof. Jastrow gives as the result of his experiments this general conclusion (*Am. Journal of Psychology*, iii. 53): "The space-perceptions of disparate senses are themselves disparate, and whatever harmony there is amongst them we are warranted in regarding as the result of experience. The spacial notions of one deprived of the sense of sight and reduced to the use of the other space-senses must indeed be different from our own." But he continues: "The existence of the striking disparities between our visual and our other space-perceptions without confusing us, and, indeed, without usually being noticed, can only be explained by the tendency to interpret all dimensions *into their visual equivalents*." But this author gives no reasons for saying 'visual' rather than 'tactile;' and I must continue to think that probabilities point the other way so far as what we call real magnitudes are concerned.

[182] Cf. Lipps on 'Complication,' *Grundtatsachen*, etc., p. 579.

[183] Ventriloquism shows this very prettily. The ventriloquist talks without moving his lips, and at the same time draws our attention to a doll, a box, or some other object. We forthwith locate the voice within this object. On the stage an actor ignorant of music sometimes has to sing, or play on the guitar or violin. He goes through the *motions* before our eyes, whilst in the orchestra or elsewhere the music is performed. But because as we listen we see the actor, it is almost impossible not to *hear* the music as if coming from where he sits or stands.

[184] Cf. Shand, in *Mind*, xiii. 340.

[185] See, e.g., Bain's Senses and Intellect, pp. 366-7, 371.

[186] When, for example, a baby looks at its own moving hand, it sees one object at the same time that it feels another. Both interest its attention, and it locates them together. But the felt object's size is the more constant size, just as the seen object is, on the whole, the more interesting and important object; and so the retinal sensations become regarded as its signs and have their 'real space-values' interpreted in tangible terms.

[187] The incoherence of the different primordial sense-spaces *inter se* is often made a pretext for denying to the primitive bodily feelings any spatial quality at all. Nothing is commoner than to hear it said: "Babies have originally no spatial perception; for when a baby's toe aches he does not place the pain in the toe. He makes no definite movements of defence, and may be vaccinated without being held." The facts are true enough; but the interpretation is all wrong. What really happens is that *the baby does not place his 'toe' in the pain*; for he knows nothing of his 'toe' as yet. He has not attended to it as a visual object; he has not handled it with his fingers; nor have its normal organic sensations or contacts yet become interesting enough to be discriminated from the whole massive feeling of the foot, or even of the leg to which it belongs. In short, the toe is neither a member of the babe's optical space, of his hand-movement space, nor an independent member of his leg-and-foot space. It has actually no mental existence yet save as this little pain-space. What wonder, then, if the pain seem a little space-world all by itself? But let the pain once associate itself with these other space-worlds, and its space will become part of their space. Let the baby feel the nurse stroking the limb and awakening the pain every time her finger passes towards the toe; let him look on and see her finger on the toe every time the pain shoots up; let him handle his foot himself and get the pain whenever the toe comes into his fingers or his mouth; let moving the leg exacerbate the pain,—and all is changed. The space of the pain becomes identified with that part of each of the other spaces which gets felt when it awakens; and by their identity with *it* these parts are identified with each other, and grow systematically connected as members of a larger extensive whole.

[188] 'Pourquoi les Sensations visuelles sont elles étendues?' in Revue Philosophique, iv. 167.—As the proofs of this chapter are being corrected, I receive the third 'Heft' of Münsterberg's Beiträge zur Experimentellen Psychologie, in which that vigorous young psychologist reaffirms (if I understand him after so hasty a glance) more radically than ever the doctrine that muscular sensation proper is our one means of measuring extension. Unable to reopen the discussion here, I am in duty bound to call the attention of the reader to Herr M.'s work.

[189] Even if the figure be drawn on a board instead of in the air, the variations of contact on the finger's surface will be much simpler than the peculiarities of the traced figure itself.

[190] See for example Duchenne, Electrification localisée, pp. 727, 770, Leyden; Virchow's Archiv, Bd. xlvii. (1869).

[191] E.g., Eulenburg, Lehrb. d. Nervenkrankheiten (Berlin), 1878, i. 3.

[192] 'Ueber den Kraftsinn,' Virchow's Archiv, Bd. lxxvii. 134.

[193] Archiv f. (Anat. u) Physiologie (1889), pp. 369, 540.

[194] Direction in its 'first intention,' of course; direction with which so far we merely become *acquainted*, and *about* which we know nothing save perhaps its difference from another direction a moment ago experienced in the same way!

[195] I have said hardly anything about associations with visual space in the foregoing account, because I wished to represent a process which the blind and the seeing man might equally share. It is to be noticed that the space suggested to the imagination when the joint moves, and projected to the distance of the finger-tip, is not represented as any *specific* skin-tract. What the seeing man imagines is a visible path; what the blind man imagines is rather a generic image, an abstraction from many

skin-spaces whose local signs have neutralized each other, and left nothing but their common vastness behind. We shall see as we go on that this generic abstraction of space-magnitude from the various local peculiarities of feeling which accompanied it when it was for the first time felt, occurs on a considerable scale in the acquired perceptions of blind as well as of seeing men.

[196] The ideal enlargement of a system of sensations by the mind is nothing exceptional. Vision is full of it; and in the manual arts, where a workman gets a tool larger than the one he is accustomed to and has suddenly to adapt all his movements to its scale, or where he has to execute a familiar set of movements in an unnatural position of body; where a piano-player meets an instrument with unusually broad or narrow keys; where a man has to alter the size of his handwriting—we see how promptly the mind multiplies once for all, as it were, the whole series of its operations by a constant factor, and has not to trouble itself after that with further adjustment of the details.

[197] Pflüger's Archiv, xlv. 65.

[198] Untersuchungen im Gebiete der Optik, Leipzig (1863), p. 188.

[199] Problems of Life and Mind, prob. vi. chap. iv. § 45.

[200] Volkman, *op. cit.* p. 189. Compare also what Hering says of the inability in his own case to make after-images seem to move when he rolls his closed eyes in their sockets; and of the insignificance of his feelings of convergence for the sense of distance (Beiträge zur Physiologie, 1881-2, pp. 31, 141). Helmholtz also allows to the muscles of convergence a very feeble share in producing our sense of the third dimension (Physiologische Optik, 649-59).

[201] Compare Lipps, Psychologische Studien (1885), p. 18, and the other arguments given on pp. 12 to 27. The most plausible reasons *for* contractions of the eyeball-muscles being admitted as original contributors to the perception of extent, are those of Wundt, Physiologische Psychologie, ii. 96-100. They are drawn from certain constant errors in our estimate of lines and angles; which, however, are susceptible, all of them, of different interpretations (see some of them further on).—Just as my MS. goes to the printer, Herr Münsterberg's Beiträge zur experimentellen Psychologie, Heft 2, comes into my hands with experiments on the measurement of space recorded in it, which, in the author's view, prove the feeling of muscular strain to be a principal factor in our vision of extent. As Münsterberg worked three hours a day for a year and a half at comparing the length of lines, seen with his eyes in different positions; and as he carefully averaged and 'percented' 20,000 observations, his conclusion must be listened to with great respect. Briefly it is this, that "our judgments of size depend on a comparison of the intensity of the feelings of movement which arise in our eyeball-muscles as we glance over the distance, and which fuse with the sensations of light" (p. 142). The facts upon which the conclusion is based are certain constant errors which Münsterberg found according as the standard or given interval was to the right or the left of the interval to be marked off as equal to it, or as it was above or below it, or stood in some more complicated relation still. He admits that he cannot explain all the errors in detail, and that we "stand before results which seem surprising and not to be unravelled, because we cannot analyze the elements which enter into the complex sensation which we receive." But he has no doubt whatever of the general fact "that the movements of the eyes and the sense of their position when fixed exert so decisive an influence on our estimate of the spaces seen, that the errors cannot possibly be explained by anything else than the movement-feelings and their reproductions in the memory" (pp. 166, 167). It is presumptuous to doubt a man's opinion when you haven't had his experience; and yet there are a number of points which make me feel like suspending judgment in regard to Herr M.'s *dictum*. He found, for example, a constant tendency to underestimate intervals lying to the right, and to overestimate intervals lying to the left. He ingeniously explains this as a result of the habit of *reading*, which trains us to move our eyes easily along straight lines from left to right, whereas in looking from right to left we move them in curved lines across the page. As we *measure intervals as straight lines*, it costs more muscular effort to measure from right to left than the other way, and an interval lying to the left seems to us

consequently longer than it really is. Now I have been a reader for more years than Herr Münsterberg; and yet with me there is a strongly pronounced error the other way. It is the rightward-lying interval which to me seems longer than it really is. Moreover, Herr M. wears concave spectacles, and looked through them with his *head fixed*. May it not be that some of the errors were due to distortion of the retinal image, as the eye looked no longer through the centre but through the margin of the glass? In short, with all the presumptions which we have seen against muscular contraction being definitely felt as length, I think that there may be explanations of Herr M.'s results which have escaped even his sagacity; and I call for a suspension of judgment until they shall have been confirmed by other observers. I do not myself doubt that our feeling of seen extent may be *altered* by concomitant muscular feelings. In Chapter XVII (pp. 28-30) we saw many examples of similar alterations, interferences with, or exaltations of, the sensory effect of one nerve-process by another. I do not see why currents from the muscles or eyelids, coming in at the same time with a retinal impression, might not make the latter seem bigger, in the same way that a greater *intensity* in the retinal stimulation makes it seem bigger; or in the way that a greater extent of surface excited makes the color of the surface seem stronger, or if it be a skin-surface, makes its heat seem greater; or in the way that the coldness of the dollar on the forehead (in Weber's old experiments) made the dollar seem heavier. But this is a *physiological* way; and the bigness gained is that of the retinal image after all. If I understand Münsterberg's meaning, it is quite different from this: the bigness belongs to the muscular feelings, as such, and is merely *associated* with those of the retina. *This* is what I deny.

[202] Archiv f. (Anat. u.) Physiol. (1889), p. 543.

[203] *Ibid.* p. 496.

[204] *Ibid.* p. 497. Goldscheider thinks that our muscles do not even give us the feeling of *resistance*, that being also due to the articular surfaces; whilst *weight* is due to the tendons. *Ibid.* p. 541.

[205] "Whilst the memories which we seeing folks preserve of a man all centre round a certain exterior form composed of his image, his height, his gait, in the blind all these memories are referred to something quite different, namely, *the sound of his voice*." (Dunan, Rev. Phil., xxv. 357.)

[206] Vol. xxv. pp. 357-8.

[207] P. 135.

[208] Essay conc. Hum. Und., bk. ii. chap. ix. § 8.

[209] Philosophical Transactions, 1841. In T. K. Abbot's Sight and Touch there is a good discussion of these cases. Obviously, positive cases are of more importance than negative. An under-witted peasant, Noé M., whose case is described by Dr. Dufour of Lausanne (Guerison d'un Aveugle né; 1876) is much made of by MM. Naville and Dunan; but it seems to me only to show how little *some* people can deal with new experiences in which others find themselves quickly at home. This man could not even tell whether one of his first objects of sight moved or stood still (p. 9).

[210] What may be the physiological process connected with this increased sensation of depth is hard to discover. It seems to have nothing to do with the parts of the retina affected, since the mere inversion of the picture (by mirrors, reflecting prisms, etc.), without inverting the head, does not seem to bring it about; nothing with sympathetic axial rotation of the eyes, which might enhance the perspective through exaggerated disparity of the two retinal images (see J. J. Müller, 'Raddrehung u. Tiefendimension,' Leipzig Acad. Berichte, 1875, page 124), for one-eyed persons get it as strongly as those with two eyes. I cannot find it to be connected with any alteration in the pupil or with any ascertainable strain in the muscles of the eye, sympathizing with those of the body. The exaggeration of distance is even greater when we throw the head over backwards and contract our superior recti in getting the view, than when we bend forward and contract the inferior recti. Making the eyes diverge

slightly by weak prismatic glasses has no such effect. To me, and to all whom I have asked to repeat the observation, the result is so marked that I do not well understand how such an observer as Helmholtz, who has carefully examined vision with inverted head, can have overlooked it. (See his *Phys. Optik*, pp. 488, 723, 728, 772.) I cannot help thinking that anyone who can explain the exaggeration of the depth-sensation in this case will at the same time throw much light on its normal constitution.

[211] "In Froriep's *Notizen* (1838, July), No. 133, is to be found a detailed account, with a picture, of an Esthonian girl, Eva Lauk, then fourteen years old, born with neither arms nor legs, which concludes with the following words: 'According to the mother, her intellect developed quite as fast as that of her brother and sisters; in particular, she came as quickly to a right judgment of the size and distance of visible objects, although, of course, she had no use of hands.'" (Schopenhauer, *Welt als Wille*, ii. 44.)

[212] *Physiol. Optik*, p. 438. Helmholtz's reservation of 'qualities' is inconsistent. Our judgments of light and color vary as much as our judgments of size, shape, and place, and ought by parity of reasoning to be called intellectual products and not sensations. In other places he does treat color as if it were an intellectual product.

[213] It is needless at this point to consider what Helmholtz's views of the nature of the intellectual space-yielding process may be. He vacillates—we shall later see how.

[214] *Op. cit.* p. 214.

[215] Before embarking on this new topic it will be well to shelve, once for all, the problem of what is the physiological process that underlies the distance-feeling. Since one-eyed people have it, and are inferior to the two-eyed only in measuring its gradations, it can have no exclusive connection with the double and disparate images produced by binocular parallax. Since people with closed eyes, looking at an after-image, do not usually see it draw near or recede with varying convergence, it cannot be simply constituted by the convergence-feeling. For the same reason it would appear non-identical with the feeling of accommodation. The differences of apparent parallactic movement between far and near objects as we move our head cannot constitute the distance-sensation, for such differences may be easily reproduced experimentally (in the movements of visible spots against a background) without engendering any illusion of perspective. Finally, it is obvious that visible faintness, dimness, and smallness *are not per se* the feeling of visible distance, however much in the case of well-known objects they *may* serve as signs to suggest it.

A certain maximum distance-value, however, being given to the field of view of the moment, whatever it be, the feelings that accompany the processes just enumerated become so many *local signs* of the gradation of distances within this maximum depth. They help us to subdivide and measure it. Itself, however, is felt as a unit, a total distance-value, determining the vastness of the whole field of view, which accordingly appears as an abyss of a certain volume. And the question still persists, what neural process is it that underlies the sense of this distance-value?

Hering, who has tried to explain the gradations within it by the interaction of certain native distance-values belonging to each point of the two retinae, seems willing to admit that the *absolute* scale of the space-volume within which the natively fixed relative distances shall appear is *not* fixed, but determined each time by 'experience in the widest sense of the word' (*Beiträge*, p. 344). What he calls the *Kernpunkt* of this space-volume is the point we are momentarily fixating. The absolute scale of the whole volume depends on the absolute distance at which this *Kernpunkt* is judged to lie from the person of the looker. "By an alteration of the localization of the *Kernpunkt*, the *inner* relations of the seen space are nowise altered; this space in its totality is as a fixed unit, so to speak, displaced with respect to the self of the looker" (p. 345). But what constitutes the localization of the *Kernpunkt*

itself at any given time, except 'Experience,' i.e., higher cerebral and intellectual processes, involving memory, Hering does not seek to define.

Stumpf, the other sensationalist writer who has best realized the difficulties of the problem, thinks that the primitive sensation of distance must have an immediate physical antecedent, either in the shape of "an organic alteration accompanying the process of accommodation, or else given directly in the specific energy of the optic nerve." In contrast with Hering, however, he thinks that it is the *absolute* distance of the spot fixated which is thus primitively, immediately, and physiologically given, and not the relative distances of other things about this spot. These, he thinks, are originally seen in what, broadly speaking, may be termed one plane with it. Whether the distance of this plane, considered as a phenomenon of our primitive sensibility, be an invariable datum, or susceptible of fluctuation, he does not, if I understand him rightly, undertake dogmatically to decide, but inclines to the former view. For him then, as for Hering, higher cerebral processes of association, under the name of 'Experience,' are the authors of fully one-half part of the distance-perceptions which we at any given time may have.

Hering's and Stumpf's theories are reported for the English reader by Mr. Sully (in *Mind*, iii. pp. 172-6). Mr. Abbott, in his *Sight and Touch* (pp. 96-8), gives a theory which is to me so obscure that I only refer the reader to its place, adding that it seems to make of distance a fixed function of retinal sensation as modified by focal adjustment. Besides these three authors I am ignorant of any, except Panum, who may have attempted to define distance as in any degree an immediate sensation. And with them the direct sensational share is reduced to a very small proportional part, in our completed distance-judgments.

Professor Lipps, in his singularly acute *Psychologische Studien* (p. 69 ff.), argues, as Ferrier, in his review of Berkeley (*Philosophical Remains*, ii. 330 ff.), had argued before him, that it is *logically impossible* we should perceive the distance of anything from the eye by sight; for a *seen* distance can only be between *seen* termini; and one of the termini, in the case of distance from the eye, is the eye itself, which is not seen. Similarly of the distance of two points behind each other: the near one *hides* the far one, no space is seen between them. For the space between two objects to be *seen*, both must appear *beside* each other, then the space in question will be *visible*. On no other condition is its visibility possible. The conclusion is that things can properly be seen only in what Lipps calls a surface, and that our knowledge of the third dimension must needs be conceptual, not sensational or visually intuitive.

But no arguments in the world can prove a feeling which actually exists to be impossible. The feeling of depth or distance, of farness or awayness, does actually exist as a fact of our visual sensibility. All that Professor Lipps's reasonings prove concerning it is that it is not linear in its character, or in its immediacy fully homogeneous and consubstantial with the feeling of literal distance between two seen termini; in short, that there are *two* sorts of optical sensation, each inexplicably due to a peculiar neural process. The neural process is easily discovered, in the case of lateral extension or spreadoutness, to be the number of retinal nerve-ends affected by the light; in the case of protension or mere farness it is more complicated and, as we have concluded, is still to seek. The two sensible qualities unite in the primitive visual bigness. The measurement of their various amounts against each other obeys the general laws of all such measurements. We discover their equivalencies by means of objects, apply the same units to both, and translate them into each other so habitually that at last they get to seem to us even quite similar in kind. This final appearance of homogeneity may perhaps be facilitated by the fact that in binocular vision two points situated on the prolongation of the optical axis of *one* of the eyes, so that the near one hides the far one, are by the *other* eye seen laterally apart. Each eye has in fact a foreshortened lateral view of the other's line of sight. In *The London Times* for Feb. 8, 1884, is an interesting letter by J. D. Dougal, who tries to explain by this reason why two-eyed rifle-shooting has such advantages over shooting with one eye closed.

[216] Just so, a pair of spectacles held an inch or so from the eyes seem like one large median glass. The faculty of seeing stereoscopic slides single without an instrument is of the utmost utility to the student of physiological optics, and persons with strong eyes can easily acquire it. The only difficulty lies in dissociating the degree of accommodation from the degree of convergence which it usually accompanies. If the right picture is focussed by the right eye, the left by the left eye, the optic axes must either be parallel or converge upon an imaginary point some distance behind the plane of the pictures, according to the size and distance apart of the pictures. The accommodation, however, has to be made for the plane of the pictures itself, and a near accommodation with a far-off convergence is something which the ordinary use of our eyes never teaches us to effect.

[217] These two observations prove the law of identical direction only for objects which excite the foveæ or lie in the line of direct looking. Observers skilled in indirect vision can, however, more or less easily verify the law for outlying retinal points.

[218] This essay, published in the Philosophical Transactions, contains the germ of almost all the methods applied since to the study of optical perception. It seems a pity that England, leading off so brilliantly the modern epoch of this study, should so quickly have dropped out of the field. Almost all subsequent progress has been made in Germany, Holland, and, *longo intervallo*, America.

[219] This is no place to report this controversy, but a few bibliographic references may not be inappropriate. Wheatstone's own experiment is in section 12 of his memoir. In favor of his interpretation see Helmholtz, *Phys. Opt.*, pp. 737-9; Wundt, *Physiol. Psychol.*, 2te Aufl. p. 144; Nagel, *Sehen mit zwei Augen*, pp. 78-82. Against Wheatstone see Volkmann, *Arch. f. Ophth.*, v. 2-74, and *Untersuchungen*, p. 266; Hering, *Beiträge zur Physiologie*, 29-45, also in Hermann's *Hdbch. d. Physiol.*, Bd. iii. 1 Th. p. 435; Aubert, *Physiologie d. Netzhaut*, p. 322; Schön, *Archiv f. Ophthal.*, xxiv. 1. pp. 56-65; and Donders, *ibid.* xiii. 1. p. 15 and note.

[220] When we see the finger the whole time, we usually put it in the line joining object and left eye if it be the left finger, joining object and right eye if it be the right finger. Microscopists, marksmen, or persons one of whose eyes is much better than the other, almost always refer directions to a single eye, as may be seen by the position of the shadow on their face when they point at a candle-flame.

[221] Professor Joseph Le Conte, who believes strongly in the identity-theory, has embodied the latter in a pair of laws of the relation between positions seen single and double, near or far, on the one hand, and convergences and retinal impressions, on the other, which, though complicated, seems to me by far the best descriptive formulation yet made of the normal facts of vision. His account is easily accessible to the reader in his volume 'Sight' in the International Scientific Series, bk. ii. c. 8, so I say no more about it now, except that it does not solve any of the difficulties we are noting in the identity-theory, nor account for the other fluctuating perceptions of which we go on to treat.

[222] Naturally it takes a smaller object at a less distance to cover by its image a constant amount of retinal surface.

[223] *Archiv f. Ophthal.*, Bd. xvii. Abth. 2, pp. 44-6 (1871).

[224] A. W. Volkmann, *Untersuchungen*, p. 253.

[225] *Philosophical Transactions*, 1852, p. 4.

[226] *Physiol. Optik*, 649-664. Later this author is led to value convergence more highly. *Arch. f. (Anat. u.) Physiol.* (1878), p. 322.

[227] *Anomalies of Accommodation and Refraction* (New Sydenham Soc. Transl., London, 1864), p. 155.

[228] These strange contradictions have been called by Aubert 'secondary' deceptions of judgment. See *Grundzüge d. Physiologischen Optik* (Leipzig, 1876), pp. 601, 615, 627. One of the best

examples of them is the small size of the moon as first seen through a telescope. It is larger and brighter, so we see its details more distinctly and judge it nearer. But because we judge it so much nearer we think it must have grown smaller. Cf. Charpentier in Jahresbericht, x. 430.

[229] Revue Philosophique, iii. 9, p. 220.

[230] See [Chapter XXIV](#).

[231] The only exception seems to be when we expressly wish to abstract from particulars, and to judge of the general 'effect.' Witness ladies trying on new dresses with their heads inclined and their eyes askance; or painters in the same attitude judging of the 'values' in their pictures.

[232] The importance of Superposition will appear later on.

[233] Physiol. Optik, p. 817.

[234] Bowditch and Hall, in Journal of Physiology, vol. iii. p. 299. Helmholtz tries to explain this phenomenon by unconscious rotations of the eyeball. But movements of the eyeball can only explain such appearances of movements as are the same over the whole field. In the windowed board one part of the field seems to move in one way, another part in another. The same is true when we turn from the spiral to look at the wall—the *centre* of the field alone swells out or contracts, the margin does the reverse or remains at rest. Mach and Dvorak have beautifully proved the impossibility of eye-rotations in this case (Sitzungsber. d. Wiener Akad., Bd. lxi.). See also Bowditch and Hall's paper as above, p. 300.

[235] Bulletins de l'Acad. de Belgique, xxi. 2; Revue Philosophique, vi. pp. 223-5; Physiologische Psychologie, 2te Aufl. p. 103. Compare Münsterberg's views, Beiträge, Heft 2, p. 174.

[236] Physiol. Optik, pp. 562-71.

[237] Physiol. Psych., pp. 107-8.

[238] Grundtatsachen des Seelenlebens, pp. 526-30.

[239] Cf. *supra*, vol. I. p. 515 ff.

[240] See Archiv f. Ophthalm., v. 2, 1 (1859), where many more examples are given.

[241] Untersuchungen, p. 250; see also p. 242.

[242] I pass over certain difficulties about double images, drawn from the perceptions of a few squinters (e.g. by Schweigger, Klin. Untersuch über das Schielen, Berlin, 1881; by Javal, Annales d'Oculistique, lxxxv. p. 217), because the facts are exceptional at best and very difficult of interpretation. In favor of the sensationalistic or nativistic view of one such case, see the important paper by Von Kries, Archiv f. Ophthalm., xxiv. 4, p. 117.

[243] Physiologische Untersuchungen im Gebiete der Optik, v.

[244] Cf. E. Mach, Beiträge zur Analyse der Empfindungen, p. 87.

[245] Cf. V. Egger, Revue Philos., xx. 488.

[246] Loeb (Pflüger's Archiv, xl. 274) has proved that muscular changes of adaptation in the eye for near and far distance are what determine the form of the relief.

[247] The strongest passage in Helmholtz's argument against sensations of space is relative to these fluctuations of seen relief: "Ought one not to conclude that if sensations of relief exist at all, they must be so faint and vague as to have no influence compared with that of past experience? Ought we not to believe that the perception of the third dimension may have arisen *without* them, since we now see it taking place as well *against* them as *with* them?" (Physiol. Optik, p. 817.)

[248] Cf. E. Mach, *Beiträge*, etc., p. 90, and the preceding chapter of the present work, [p. 86](#) ff.

[249] I ought to say that I seem always able to see the cross rectangular at will. But this appears to come from an imperfect absorption of the rectangular after-image by the inclined plane at which the eyes look. The cross, with me, is apt to detach itself from this and then look square. I get the illusion better from the circle, whose after-image becomes in various ways elliptical on being projected upon the different surfaces of the room, and cannot then be easily made to look circular again.

[250] In Chapter XVIII, [p. 74](#), I gave a reason why imaginations *ought* not to be as vivid as sensations. It should be borne in mind that that reason does not apply to these complemental imaginings of the real shape of things actually before our eyes.

[251] Hermann's *Handb. der Physiologie*, iii. 1. p. 565-71.

[252] *Bulletin de l'Académie de Belgique*, 2me Série, xix. 2.

[253] Wundt seeks to explain all these illusions by the relatively stronger 'feeling of innervation' needed to move the eyeballs upwards,—a careful study of the muscles concerned is taken to prove this,—and a consequently greater estimate of the distance traversed. It suffices to remark, however, with Lipps, that were the innervation all, a column of S's placed on top of each other should look each larger than the one below it, and a weathercock on a steeple gigantic, neither of which is the case. Only the halves of *the same object* look different in size, because the customary correction for foreshortening bears only on the relations of the parts of special *things* spread out before us. Cf. Wundt, *Physiol. Psych.*, 2te Aufl. ii. 96-8; Th. Lipps, *Grundtatsachen*, etc., p. 535.

[254] Hering would partly solve in this way the mystery of Figs. 60, 61, and 67. No doubt the explanation partly applies; but the strange cessation of the illusion when we fix the gaze fails to be accounted for thereby.

[255] Helmholtz has sought (*Physiol. Optik*, p. 715) to explain the divergence of the apparent vertical meridians of the two retinae, by the manner in which an identical line drawn on the ground before us in the median plane will throw its images on the two eyes respectively. The matter is too technical for description here; the unlearned reader may be referred for it to J. Le Conte's *Sight in the Internat. Scient. Series*, p. 198 ff. But, for the benefit of those to whom *verbum sat*, I cannot help saying that it seems to me that the *exactness* of the relation of the two meridians—whether divergent or not, for their divergence differs in individuals and often in one individual at diverse times—precludes its being due to the mere habitual falling-off of the image of one objective line on both. Le Conte, e.g., measures their position down to a sixth of a degree, others to tenths. This indicates an organic identity in the sensations of the two retinae, which the experience of median perspective horizontals may roughly have agreed with, but hardly can have engendered. Wundt explains the divergence as usual, by the *Innervationsgefühl* (*op. cit.* ii. 99 ff.).

[256] *Physiol. Optik*, p. 547.

[257] "We can with a short ruler draw a line as long as we please on a plane surface by first drawing one as long as the ruler permits, and then sliding the ruler somewhat along the drawn line and drawing again, etc. If the ruler is exactly straight, we get in this way a straight line. If it is somewhat curved we get a circle. Now, instead of the sliding ruler we use in the field of sight the central spot of distinctest vision impressed with a linear sensation of sight, which at times may be intensified till it becomes an after-image. We follow, in looking, the direction of this line, and in so doing we slide the line along itself and get a prolongation of its length. On a plane surface we can carry on this procedure on any sort of a straight or curved ruler, but in the field of vision there is for each direction and movement of the eye only one sort of line which it is possible for us to slide along in its own direction continually." These are what Helmholtz calls the 'circles of direction' of the visual field—lines which he has studied with his usual care. Cf. *Physiol. Optik*, p. 548 ff.

[258] Cf. Hering in Hermann's Handb. der Physiol., iii. 1, pp. 558-4.

[259] This shrinkage and expansion of the absolute space-value of the total optical sensation remains to my mind the most obscure part of the whole subject. It is a real optical sensation, seeming introspectively to have nothing to do with locomotor or other suggestions. It is easy to say that 'the Intellect produces it,' but what does that mean? The investigator who will throw light on this one point will probably clear up other difficulties as well.

[260] Examination of Hamilton, 3d ed. p. 283.

[261] Senses and Intellect, 3d ed. p. 183.

[262] Exam. of Hamilton, 3d ed. p. 283.

[263] Senses and Intellect, p. 372.

[264] Vierfache Wurzel des Satzes vom zureichenden Grunde, pp. 52-7.

[265] Psychol. als Wissenschaft, § 111.

[266] Psychol. als Wissenschaft, § 113.

[267] Lehrbuch d. Psychol., 2te Auflage, Bd. ii. p. 66. Volkmann's fifth chapter contains a really precious collection of historical notices concerning space-perception theories.

[268] Why talk of 'genetic theories'? when we have in the next breath to write as Wundt does: "If then we must regard the intuition of space as a product that simply emerges from the conditions of our mental and physical organization, nothing need stand in the way of our designating it as one of the *a priori* functions with which consciousness is endowed." (Logik, ii. 460.)

[269] P. 430.

[270] Pp. 430, 449.

[271] P. 428.

[272] P. 442.

[273] Pp. 442, 818.

[274] P. 798. Cf. also Popular Scientific Lectures, pp. 301-3.

[275] P. 456; see also 428, 441.

[276] P. 797.

[277] P. 812.

[278] Bottom of page 797.

[279] In fact, to borrow a simile from Prof. G. E. Müller (Theorie der sinnl. Aufmerksamkeit, p. 38), the various senses bear in the Helmholtzian philosophy of perception the same relation to the 'object' perceived by their means that a troop of jolly drinkers bear to the landlord's bill, when no one has any money, but each hopes that one of the rest will pay.

[280] Grundtatsachen des Seelenlebens (1883), pp. 480, 591-2. Psychologische Studien (1885), p. 14.

[281] Psychology, ii. p. 174.

[282] *Ibid.* p. 168.

[283] Senses and Intellect, 3d ed. pp. 366-75.

[284] Cf. Hall and Donaldson in Mind, x. 559.

[285] As other examples of the confusion, take Mr. Sully: "The *fallacious assumption* that there can be an idea of distance in general, apart from particular distances" (Mind, iii. p. 177); and Wundt: "An indefinite localization, which waits for experience to give it its reference to real space, stands in contradiction with the very idea of localization, which means the reference to a determinate point of space" (Physiol. Psych., 1te Aufl. p. 480).

[286] G. Berkeley: Essay towards a new Theory of Vision; Samuel Bailey: A Review of Berkeley's Theory of Vision (1842); J. S. Mill's Review of Bailey, in his Dissertations and Disquisitions, vol. ii; Jas. Ferrier: Review of Bailey, in 'Philosophical Remains,' vol. ii; A. Bain: Senses and Intellect, 'Intellect,' chap. i; H. Spencer: Principles of Psychology, pt. vi. chaps. xiv, xvi; J. S. Mill: Examination of Hamilton, chap. xiii (the best statement of the so-called English empiricist position); T. K. Abbott: Sight and Touch, 1861 (the first English book to go at all minutely into *facts*; Mr. Abbott maintaining retinal sensations to be originally of space in three dimensions); A. C. Fraser: Review of Abbott, in North British Review for Aug. 1864; another review in Macmillan's Magazine, Aug. 1866; J. Sully: Outlines of Psychology, chap. vi; J. Ward: Encyclop. Britannica, 9th Ed., article 'Psychology,' pp. 53-5; J. E. Walter: The Perception of Space and Matter (1879)—I may also refer to a discussion between Prof. G. Groom Robertson, Mr. J. Ward, and the present writer, in Mind, vol. xiii.—The present chapter is only the filling out with detail of an article entitled 'The Spatial Quale,' which appeared in the Journal of Speculative Philosophy for January 1879 (xiii. 64).

CHAPTER XXI.^[287]

THE PERCEPTION OF REALITY.

BELIEF.

Everyone knows the difference between imagining a thing and believing in its existence, between supposing a proposition and acquiescing in its truth. In the case of acquiescence or belief, the object is not only apprehended by the mind, but is held to have reality. Belief is thus the mental state or function of cognizing reality. As used in the following pages, 'Belief' will mean every degree of assurance, including the highest possible certainty and conviction.

There are, as we know, two ways of studying every psychic state. First, the way of analysis: What does it consist in? What is its inner nature? Of what sort of mind-stuff is it composed? Second, the way of history: What are its conditions of production, and its connection with other facts?

Into the first way we cannot go very far. *In its inner nature, belief, or the sense of reality, is a sort of feeling more allied to the emotions than to*

anything else. Mr. Bagehot distinctly calls it the 'emotion' of conviction. I just now spoke of it as acquiescence. It resembles more than anything what in the psychology of volition we know as consent. Consent is recognized by all to be a manifestation of our active nature. It would naturally be described by such terms as 'willingness' or the 'turning of our disposition.' What characterizes both consent and belief is the cessation of theoretic agitation, through the advent of an idea which is inwardly stable, and fills the mind solidly to the exclusion of contradictory ideas. When this is the case, motor effects are apt to follow. Hence the states of consent and belief, characterized by repose on the purely intellectual side, are both intimately connected with subsequent practical activity. This inward stability of the mind's content is as characteristic of disbelief as of belief. But we shall presently see that we never disbelieve anything except for the reason that we believe something else which contradicts the first thing.^[288] Disbelief is thus an incidental complication to belief, and need not be considered by itself.

The true opposites of belief, psychologically considered, are doubt and inquiry, not disbelief. In both these states the content of our mind is in unrest, and the emotion engendered thereby is, like the emotion of belief itself, perfectly distinct, but perfectly indescribable in words. Both sorts of emotion may be pathologically exalted. One of the charms of drunkenness unquestionably lies in the deepening of the sense of reality and truth which is gained therein. In whatever light things may then appear to us, they seem more utterly what they are, more 'utterly utter' than when we are sober. This goes to a fully unutterable extreme in the nitrous oxide intoxication, in which a man's very soul will sweat with conviction, and he be all the while unable to tell what he is convinced of at all.^[289] The pathological state opposed to this solidity and deepening has been called the questioning mania (*Grübelsucht* by the Germans). It is sometimes found as a substantive affection, paroxysmal or chronic, and consists in the inability to rest in any conception, and the need of having it confirmed and explained. 'Why do I stand here where I stand?' 'Why is a glass a glass, a chair a chair?' 'How is it that men are only of the size they are? Why not as big as houses,'

etc., etc.^[290] There is, it is true, another pathological state which is as far removed from doubt as from belief, and which some may prefer to consider the proper contrary of the latter state of mind. I refer to the feeling that everything is hollow, unreal, dead. I shall speak of this state again upon a later page. The point I wish to notice here is simply that belief and disbelief are but two aspects of one psychic state.

John Mill, reviewing various opinions about belief, comes to the conclusion that no account of it can be given:

"What," he says, "is the difference *to our minds* between thinking of a reality and representing to ourselves an imaginary picture? I confess I can see no escape from the opinion that the distinction is ultimate and primordial. There is no more difficulty in holding it to be so than in holding the difference between a sensation and an idea to be primordial. It seems almost another aspect of the same difference.... I cannot help thinking, therefore, that there is in the remembrance of a real fact, as distinguished from that of a thought, an element which does not consist... in a difference between the mere ideas which are present to the mind in the two cases. This element, howsoever we define it, constitutes belief, and is the difference between Memory and Imagination. From whatever direction we approach, this difference seems to close our path. When we arrive at it, we seem to have reached, as it were, the central point of our intellectual nature, presupposed and built upon in every attempt we make to explain the more recondite phenomena of our mental being."^[291]

If the words of Mill be taken to apply to the mere subjective analysis of belief—to the question, What does it feel like when we have it?—they must be held, on the whole, to be correct. Belief, the sense of reality, feels like itself—that is about as much as we can say.

Prof. Brentano, in an admirable chapter of his *Psychologie*, expresses this by saying that conception and belief (which he names *judgment*) are two different fundamental psychic phenomena. What I myself have called (Vol.

I, p. 275) the 'object' of thought may be comparatively simple, like "Ha! what a pain," or "It-thunders"; or it may be complex, like "Columbus-discovered-America-in-1492," or "There-exists-an-all-wise-Creator-of-the-world." In either case, however, the mere thought of the object may exist as something quite distinct from the belief in its reality. The belief, as Brentano says, presupposes the mere thought:

"Every object comes into consciousness in a twofold way, as simply thought of [*vorgestellt*] and as admitted [*anerkannt*] or denied. The relation is analogous to that which is assumed by most philosophers (by Kant no less than by Aristotle) to obtain between mere thought and desire. Nothing is ever desired without being thought of; but the desiring is nevertheless a second quite new and peculiar form of relation to the object, a second quite new way of receiving it into consciousness. No more is anything judged [i.e., believed or disbelieved] which is not thought of too. But we must insist that, so soon as the object of a thought becomes the object of an assenting or rejecting judgment, our consciousness steps into an entirely new relation towards it. It is then twice present in consciousness, as thought of, and as held for real or denied; just as when desire awakens for it, it is both thought and simultaneously desired." (P. 266.)

The commonplace doctrine of 'judgment' is that it consists in the combination of 'ideas' by a 'copula' into a 'proposition,' which may be of various sorts, as affirmative, negative, hypothetical, etc. But who does not see that in a disbelieved or doubted or interrogative or conditional proposition, the ideas are combined in the same identical way in which they are in a proposition which is solidly believed? *The way in which the ideas are combined is a part of the inner constitution of the thought's object or content.* That object is sometimes an articulated whole with relations between its parts, amongst which relations, that of predicate to subject may be one. But when we have got our object with its inner constitution thus defined in a proposition, then the question comes up regarding the object as a whole: 'Is it a real object? is this proposition a true proposition or not?' And in the answer *Yes* to *this* question lies that new psychic act which Brentano calls 'judgment,' but which I prefer to call 'belief.'

In every proposition, then, so far as it is believed, questioned, or disbelieved, four elements are to be distinguished, the subject, the predicate, and their relation (of whatever sort it be)—these form the *object* of belief—and finally the psychic attitude in which our mind stands towards the proposition taken as a whole—and this is the belief itself.^[292]

Admitting, then, that this attitude is a state of consciousness *sui generis*, about which nothing more can be said in the way of internal analysis, let us proceed to the second way of studying the subject of belief: *Under what circumstances do we think things real?* We shall soon see how much matter this gives us to discuss.

THE VARIOUS ORDERS OF REALITY.

Suppose a new-born mind, entirely blank and waiting for experience to begin. Suppose that it begins in the form of a visual impression (whether faint or vivid is immaterial) of a lighted candle against a dark background, and nothing else, so that whilst this image lasts it constitutes the entire universe known to the mind in question. Suppose, moreover (to simplify the hypothesis), that the candle is only imaginary, and that no 'original' of it is recognized by us psychologists outside. Will this hallucinatory candle be believed in, will it have a real existence for the mind?

What possible sense (for that mind) would a suspicion have that the candle was not real? What would doubt or disbelief of it imply? When *we*, the onlooking psychologists, say the candle is unreal, we mean something quite definite, viz., that there is a world known to *us* which *is* real, and to which we perceive that the candle does not belong; it belongs exclusively to that individual mind, has no *status* anywhere else, etc. It exists, to be sure, in a fashion, for it forms the content of that mind's hallucination; but the hallucination itself, though unquestionably it is a sort of existing fact, has no knowledge of *other* facts; and since those *other* facts are the realities *par excellence* for us, and the only things we believe in, the candle is simply outside of our reality and belief altogether.

By the hypothesis, however, the *mind which sees the candle* can spin no such considerations as these about it, for of other facts, actual or possible, it has no inkling whatever. That candle is its all, its absolute. Its entire faculty

of attention is absorbed by it. It *is*, it is *that*; it is *there*; no other possible candle, or quality of this candle, no other possible place, or possible object in the place, no alternative, in short, suggests itself as even conceivable; so how can the mind help believing the candle real? The supposition that it might possibly not do so is, under the supposed conditions, unintelligible. [293]

This is what Spinoza long ago announced:

"Let us conceive a boy," he said, "imagining to himself a horse, and taking note of nothing else. As this imagination involves the existence of the horse, *and the boy has no perception which annuls its existence*, he will necessarily contemplate the horse as present, nor will he be able to doubt of its existence, however little certain of it he may be. I deny that a man in so far as he imagines [*percipit*] affirms nothing. For what is it to imagine a winged horse but to affirm that, the horse [that horse, namely] has wings? For if the mind had nothing before it but the winged horse it would contemplate the same as present, would have no cause to doubt of its existence, nor any power of dissenting from its existence, unless the imagination of the winged horse were joined to an idea which contradicted [*tollit*] its existence." (Ethics, ii. 49, Scholium.)

The sense that anything we think of is unreal can only come, then, when that thing is contradicted by some other thing of which we think. *Any object which remains uncontradicted is ipso facto believed and posited as absolute reality.*

Now, how comes it that one thing thought of can be contradicted by another? It cannot unless it begins the quarrel by saying something inadmissible about that other. Take the mind with the candle, or the boy with the horse. If either of them say, 'That candle or that horse, even when I don't see it, exists in *the outer world*,' he pushes into 'the outer world' an object which may be incompatible with everything which he otherwise knows of that world. If so, he must take his choice of which to hold by, the present perceptions or the other knowledge of the world. If he holds to the other knowledge, the present perceptions are contradicted, *so far as their relation to that world goes*. Candle and horse, whatever they may be, are not existents in outward space. They are existents, of course; they are

mental objects; mental objects have existence as mental objects. But they are situated in their own spaces, the space in which they severally appear, and neither of those spaces is the space in which the realities called 'the outer world' exist.

Take again the horse with wings. If I merely dream of a horse with wings, my horse interferes with nothing else and has not to be contradicted. That horse, its wings, and its place, are all equally real. That horse exists no otherwise than as winged, and is moreover really there, for that place exists no otherwise than as the place of that horse, and claims as yet no connection with the other places of the world. But if with this horse I make an inroad into the *world otherwise known*, and say, for example, 'That is my old mare Maggie, having grown a pair of wings where she stands in her stall,' the whole case is altered; for now the horse and place are identified with a horse and place otherwise known, and *what* is known of the latter objects is incompatible with what is perceived with the former. 'Maggie in her stall with wings! Never!' The wings are unreal, then, visionary. I have dreamed a lie about Maggie in her stall.

The reader will recognize in these two cases the two sorts of judgment called in the logic-books existential and attributive respectively. The candle exists as an outer reality' is an existential, 'My Maggie has got a pair of wings' is an attributive, proposition;^[294] and it follows from what was first said that *all propositions, whether attributive or existential, are believed through the very fact of being conceived, unless they clash with other propositions believed, at the same time, by affirming that their terms are the same with the terms of these other propositions.* A dream-candle has existence, true enough; but not the same existence (existence for itself, namely, or *extra mentem meam*) which the candles of waking perception have. A dream-horse has wings; but then neither horse nor wings are the same with any horses or wings known to memory. That we can at any moment think of the same thing which at any former moment we thought of is the ultimate law of our intellectual constitution. But when we now think of it incompatibly with our other ways of thinking it, then we must choose which way to stand by, for we cannot continue to think in two contradictory ways at once. *The whole distinction of real and unreal, the whole psychology of belief, disbelief, and doubt, is thus grounded on two mental facts—first, that we are liable to think differently of the same; and second,*

that when we have done so, we can choose which way of thinking to adhere to and which to disregard.

The subjects adhered to become real subjects, the attributes adhered to real attributes, the existence adhered to real existence; whilst the subjects disregarded become imaginary subjects, the attributes disregarded erroneous attributes, and the existence disregarded an existence in no man's land, in the limbo 'where footless fancies dwell.' The real things are, in M. Taine's terminology, the *reductives* of the things judged unreal.

THE MANY WORLDS.

Habitually and practically we do not *count* these disregarded things as existents at all. For them *Væ victis* is the law in the popular philosophy; they are not even treated as appearances; they are treated as if they were mere waste, equivalent to nothing at all. To the genuinely philosophic mind, however, they still have existence, though not the same existence, as the real things. *As* objects of fancy, *as* errors, *as* occupants of dreamland, etc., they are in their way as indefeasible parts of life, as undeniable features of the Universe, as the realities are in their way. The total world of which the philosophers must take account is thus composed of the realities *plus* the fancies and illusions.

Two sub-universes, at least, connected by relations which philosophy tries to ascertain! Really there are more than two sub-universes of which we take account, some of us of this one, and others of that. For there are various categories both of illusion and of reality, and alongside of the world of absolute error (i.e., error confined to single individuals) but still within the world of absolute reality (i.e., reality believed by the complete philosopher) there is the world of collective error, there are the worlds of abstract reality, of relative or practical reality, of ideal relations, and there is the supernatural world. The popular mind conceives of all these sub-worlds more or less disconnectedly; and when dealing with one of them, forgets for the time being its relations to the rest. The complete philosopher is he who seeks not only to assign to every given object of his thought its right place in one or other of these sub-worlds, but he also seeks to determine the relation of each sub-world to the others in the total world which *is*.

The most important sub-universes commonly discriminated from each other and recognized by most of us as existing, each with its own special and separate style of existence, are the following:

(1) The world of sense, or of physical 'things' as we instinctively apprehend them, with such qualities as heat, color, and sound, and such 'forces' as life, chemical affinity, gravity, electricity, all existing as such within or on the surface of the things.

(2) The world of science, or of physical things as the learned conceive them, with secondary qualities and 'forces' (in the popular sense) excluded, and nothing real but solids and fluids and their 'laws' (i.e., customs) of motion.^[295]

(3) The world of ideal relations, or abstract truths believed or believable by all, and expressed in logical, mathematical, metaphysical, ethical, or æsthetic propositions.

(4) The world of 'idols of the tribe,' illusions or prejudices common to the race. All educated people recognize these as forming one sub-universe. The motion of the sky round the earth, for example, belongs to this world. That motion is not a recognized item of any of the other worlds; but as an 'idol of the tribe' it really exists. For certain philosophers 'matter' exists only as an idol of the tribe. For science, the 'secondary qualities' of matter are but 'idols of the tribe.'

(5) The various supernatural worlds, the Christian heaven and hell, the world of the Hindoo mythology, the world of Swedenborg's *visa et audita*, etc. Each of these is a consistent system, with definite relations among its own parts. Neptune's trident, e.g., has no status of reality whatever in the Christian heaven; but within the classic Olympus certain definite things are true of it, whether one believe in the reality of the classic mythology as a whole or not. The various worlds of deliberate fable may be ranked with these worlds of faith—the world of the *Iliad*, that of *King Lear*, of the *Pickwick Papers*, etc.^[296]

(6) The various worlds of individual opinion, as numerous as men are.

(7) The worlds of sheer madness and vagary, also indefinitely numerous.

*Every object we think of gets at last referred to one world or another of this or of some similar list. It settles into our belief as a common-sense object, a scientific object, an abstract object, a mythological object, an object of some one's mistaken conception, or a madman's object; and it reaches this state sometimes immediately, but often only after being hustled and bandied about amongst other objects until it finds some which will tolerate its presence and stand in relations to it which nothing contradicts. The molecules and ether-waves of the scientific world, for example, simply kick the object's warmth and color out, they refuse to have any relations with them. But the world of 'idols of the tribe' stands ready to take them in. Just so the world of classic myth takes up the winged horse; the world of individual hallucination, the vision of the candle; the world of abstract truth, the proposition that justice is kingly, though no actual king be just. The various worlds themselves, however, appear (as aforesaid) to most men's minds in no very definitely conceived relation to each other, and our attention, when it turns to one, is apt to drop the others for the time being out of its account. Propositions concerning the different worlds are made from 'different points of view'; and in this more or less chaotic state the consciousness of most thinkers remains to the end. Each world *whilst it is attended to* is real after its own fashion; only the reality lapses with the attention.*

THE WORLD OF 'PRACTICAL REALITIES.'

Each thinker, however, has dominant habits of attention; and these *practically elect from among the various worlds some one to be for him the world of ultimate realities*. From this world's objects he does not appeal. Whatever positively contradicts them must get into another world or die. The horse, e.g., may have wings to its heart's content, so long as it does not pretend to be the real world's horse—*that* horse is absolutely wingless. For most men, as we shall immediately see, the 'things of sense' hold this prerogative position, and are the absolutely real world's nucleus. Other things, to be sure, may be real for this man or for that—things of science, abstract moral relations, things of the Christian theology, or what not. But even for the special man, these things are usually real with a less real reality than that of the things of sense. They are taken less seriously; and the very

utmost that can be said for anyone's belief in them is that it is as strong as his 'belief in his own senses.'^[297]

In all this the everlasting partiality of our nature shows itself, our inveterate propensity to choice. For, in the strict and ultimate sense of the word existence, everything which can be thought of at all exists as *some* sort of object, whether mythical object, individual thinker's object, or object in outer space and for intelligence at large. Errors, fictions, tribal beliefs, are parts of the whole great Universe which God has made, and He must have meant all these things to be in it, each in its respective place. But for us finite creatures, "'tis to consider too curiously to consider so." The mere fact of appearing as an object at all is not enough to constitute reality. That may be metaphysical reality, reality for God; but what we need is practical reality, reality for ourselves; and, to have that, an object must not only appear, but it must appear both *interesting* and *important*. The worlds whose objects are neither interesting nor important we treat simply negatively, we brand them as *unreal*.

In the relative sense, then, the sense in which we contrast reality with simple *unreality*, and in which one thing is said to have *more* reality than another, and to be more believed, *reality means simply relation to our emotional and active life*. This is the only sense which the word ever has in the mouths of practical men. *In this sense, whatever excites and stimulates our interest is real*; whenever an object so appeals to us that we turn to it, accept it, fill our mind with it, or practically take account of it, so far it is real for us, and we believe it. Whenever, on the contrary, we ignore it, fail to consider it or act upon it, despise it, reject it, forget it, so far it is unreal for us and disbelieved. Hume's account of the matter was then essentially correct, when he said that belief in anything was simply the having the idea of it in a lively and active manner:

"I say, then, that belief is nothing but a more vivid, lively, forcible, firm, steady conception of an object than the imagination alone is ever able to attain.... It consists not in the peculiar nature or order of the ideas, but in the *manner* of their conception and in their *feeling* to the mind. I confess that it is impossible perfectly to explain this feeling or manner of conception.... Its true and proper name... is *belief*, which is a term that everyone sufficiently understands in common life. And in

philosophy we can go no farther than assert that belief is something felt by the mind, which distinguishes the idea of the judgment from the fictions of the imagination.^[298] It gives them more weight and influence; makes them appear of greater importance; enforces them in the mind; gives them a superior influence on the passions, and renders them the governing principle in our actions."^[299]

Or as Prof. Bain puts it: "In its essential character, belief is a phase of our active nature—otherwise called the Will."^[300]

The object of belief, then, reality or real existence, is something quite different from all the other predicates which a subject may possess. Those are properties intellectually or sensibly intuited. When we add any one of them to the subject, we increase the intrinsic content of the latter, we enrich its picture in our mind. But adding reality does not enrich the picture in any such inward way; it leaves it inwardly as it finds it, and only fixes it and stamps it in to *us*.

"The real," as Kant says, "contains no more than the possible. A hundred real dollars do not contain a penny more than a hundred possible dollars.... By whatever, and by however many, predicates I may think a thing, nothing is added to it if I add that the thing exists.... Whatever, therefore, our concept of an object may contain, we must always step outside of it in order to attribute to it existence."^[301]

The 'stepping outside' of it is the establishment either of immediate practical relations between it and ourselves, or of relations between it and other objects with which we have immediate practical relations. Relations of this sort, which are as yet not transcended or superseded by others, are *ipso facto* real relations, and confer reality upon their objective term. *The fons et origo of all reality, whether from the absolute or the practical point of view, is thus subjective, is ourselves.* As bare logical thinkers, without emotional reaction, we give reality to whatever objects we think of, for they are really phenomena, or objects of our passing thought, if nothing more. But, *as*

thinkers with emotional reaction, we give what seems to us a still higher degree of reality to whatever things we select and emphasize and turn to WITH A WILL. These are our *living* realities; and not only these, but all the other things which are intimately connected with these. Reality, starting from our Ego, thus sheds itself from point to point—first, upon all objects which have an immediate sting of interest for our Ego in them, and next, upon the objects most continuously related with these. It only fails when the connecting thread is lost. A whole system may be real, if it only hang to our Ego by one immediately *stinging* term. But what contradicts any such stinging term, even though it be another stinging term itself, is either not believed, or only believed after settlement of the dispute.

We reach thus the important conclusion that *our own reality, that sense of our own life which we at every moment possess, is the ultimate of ultimates for our belief.* 'As sure as I exist!'—this is our uttermost warrant for the being of all other things. As Descartes made the indubitable reality of the *cogito* go bail for the reality of all that the *cogito* involved, so we all of us, feeling our own present reality with absolutely coercive force, ascribe an all but equal degree of reality, first to whatever things we lay hold on with a sense of personal need, and second, to whatever farther things continuously belong with these. "Mein Jetzt und Hier," as Prof. Lipps says, "ist der letzte Angelpunkt für alle Wirklichkeit, also alle Erkenntniss."

The world of living realities as contrasted with unrealities is thus anchored in the Ego, considered as an active and emotional term.^[302] That is the hook from which the rest dangles, the absolute support. And as from a painted hook it has been said that one can only hang a painted chain, so conversely, from a real hook only a real chain can properly be hung. *Whatever things have intimate and continuous connection with my life are things of whose reality I cannot doubt.* Whatever things fail to establish this connection are things which are practically no better for me than if they existed not at all.

In certain forms of melancholic perversion of the sensibilities and reactive powers, nothing touches us intimately, rouses us, or wakens natural feeling. The consequence is the complaint so often heard from melancholic patients,

that nothing is believed in by them as it used to be, and that all sense of reality is fled from life. They are sheathed in india-rubber; nothing penetrates to the quick or draws blood, as it were. According to Griesinger, "I see, I hear!" such patients say, "but the objects do not reach me, it is as if there were a wall between me and the outer world!"

"In such patients there often is an alteration of the cutaneous sensibility, such that things feel indistinct or sometimes rough and woolly. But even were this change always present, it would not completely explain the psychic phenomenon... which reminds us more of the alteration in our psychic relations to the outer world which advancing age on the one hand, and on the other emotions and passions, may bring about. In childhood we feel ourselves to be closer to the world of sensible phenomena, we live immediately with them and in them; an intimately vital tie binds us and them together. But with the ripening of reflection this tie is loosened, the warmth of our interest cools, things look differently to us, and we act more as foreigners to the outer world, even though we know it a great deal better. Joy and expansive emotions in general draw it nearer to us again. Everything makes a more lively impression, and with the quick immediate return of this warm receptivity for sense impressions, joy makes us feel young again. In depressing emotions it is the other way. Outer things, whether living or inorganic, suddenly grow cold and foreign to us, and even our favorite objects of interest feel as if they belonged to us no more. Under these circumstances, receiving no longer from anything a lively impression, we cease to turn towards outer things, and the sense of inward loneliness grows upon us.... Where there is no strong intelligence to control this *blasé* condition, this psychic coldness and lack of interest, the issue of these states in which all seems so cold and hollow, the heart dried up, the world grown dead and empty, is often suicide or the deeper forms of insanity."^[303]

THE PARAMOUNT REALITY OF SENSATIONS.

But now we are met by questions of detail. What does this stirring, this exciting power, this interest, consist in, which some objects have? which

are those 'intimate relations' with our life which give reality? And what things stand in these relations immediately, and what others are so closely connected with the former that (in Hume's language) we 'carry our disposition' also on to them?

In a simple and direct way these questions cannot be answered at all. The whole history of human thought is but an unfinished attempt to answer them. For what have men been trying to find out, since men were men, but just those things: "Where do our true interests lie—which relations shall we call the intimate and real ones—which things shall we call living realities and which not?" A few psychological points can, however, be made clear.

Any relation to our mind at all, in the absence of a stronger relation, suffices to make an object real. The barest appeal to our attention is enough for that. Revert to the beginning of the chapter, and take the candle entering the vacant mind. The mind was waiting for just some such object to make its spring upon. It makes its spring and the candle is believed. But when the candle appears at the same time with other objects, it must run the gauntlet of their rivalry, and then it becomes a question which of the various candidates for attention shall compel belief. As a rule we believe as much as we can. We would believe everything if we only could. When objects are represented by us quite unsystematically they conflict but little with each other, and the number of them which in this chaotic manner we can believe is limitless. The primitive savage's mind is a jungle in which hallucinations, dreams, superstitions, conceptions, and sensible objects all flourish alongside of each other, unregulated except by the attention turning in this way or in that. The child's mind is the same. It is only as objects become permanent and their relations fixed that discrepancies and contradictions are felt and must be settled in some stable way. As a rule, the success with which a contradicted object maintains itself in our belief is proportional to several qualities which it must possess. Of these the one which would be put first by most people, because it characterizes objects of sensation, is its —

(1) Coerciveness over attention, or the mere power to possess consciousness: then follow—

(2) Liveliness, or sensible pungency, especially in the way of exciting pleasure or pain;

- (3) Stimulating effect upon the will, i.e., capacity to arouse active impulses, the more instinctive the better;
- (4) Emotional interest, as object of love, dread, admiration, desire, etc.;
- (5) Congruity with certain favorite forms of contemplation—unity, simplicity, permanence, and the like;
- (6) Independence of other causes, and its own causal importance.

These characters run into each other. Coerciveness is the result of liveliness or emotional interest. What is lively and interesting stimulates *eo ipso* the will; congruity holds of active impulses as well as of contemplative forms; causal independence and importance suit a certain contemplative demand, etc. I will therefore abandon all attempt at a formal treatment, and simply proceed to make remarks in the most convenient order of exposition.

As a whole, sensations are more lively and are judged more real than conceptions; things met with every hour more real than things seen once; attributes perceived when awake, more real than attributes perceived in a dream. But, owing to the *diverse relations contracted by the various objects with each other*, the simple rule that the lively and permanent is the real is often enough disguised. A conceived thing may be deemed more real than a certain sensible thing, if it only be intimately related to other sensible things more vivid, permanent, or interesting than the first one. Conceived molecular vibrations, e.g., are by the physicist judged more real than felt warmth, because so intimately related to all those other facts of motion in the world which he has made his special study. Similarly, a rare thing may be deemed more real than a permanent thing if it be more widely related to other permanent things. All the occasional crucial observations of science are examples of this. A rare experience, too, is likely to be judged more real than a permanent one, if it be more interesting and exciting. Such is the sight of Saturn through a telescope; such are the occasional insights and illuminations which upset our habitual ways of thought.

But no mere floating conception, no mere disconnected rarity, ever displaces vivid things or permanent things from our belief. A conception, to

prevail, must *terminate* in the world of orderly sensible experience. A rare phenomenon, to displace frequent ones, must belong with others more frequent still. The history of science is strewn with wrecks and ruins of theory—essences and principles, fluids and forces—once fondly clung to, but found to hang together with no facts of sense. And exceptional phenomena solicit our belief in vain until such time as we chance to conceive them as of kinds already admitted to exist. What science means by 'verification' is no more than this, that no object of conception shall be believed which sooner or later has not some permanent and vivid object of sensation for its *term*. Compare what was said on [pages 3-7](#), above.

Sensible objects are thus either our realities or the tests of our realities. Conceived objects must show sensible effects or else be disbelieved. And the effects, even though reduced to relative unreality when their causes come to view (as heat, which molecular vibrations make unreal), are yet the things on which our knowledge of the causes rests. Strange mutual dependence this, in which the appearance needs the reality in order to exist, but the reality needs the appearance in order to be known!

*Sensible vividness or pungency is then the vital factor in reality when once the conflict between objects, and the connecting of them together in the mind, has begun. No object which neither possesses this vividness in its own right nor is able to borrow it from anything else has a chance of making headway against vivid rivals, or of rousing in us that reaction in which belief consists. On the vivid objects we *pin*, as the saying is, our faith in all the rest; and our belief returns instinctively even to those of them from which reflection has led it away. Witness the obduracy with which the popular world of colors, sounds, and smells holds its own against that of molecules and vibrations. Let the physicist himself but nod, like Homer, and the world of sense becomes his absolute reality again.*^[304]

That things originally devoid of this stimulating power should be enabled, by association with other things which have it, to compel our belief as if they had it themselves, is a remarkable psychological fact, which since Hume's time it has been impossible to overlook.

"The vividness of the first conception," he writes, "diffuses itself along the relations and is conveyed, as by so many pipes or channels, to every idea that has any communication with the primary one...."

Superstitious people are fond of the relics of saints and holy men, for the same reason that they seek after types and images, in order to enliven their devotion and give them a more intimate and strong conception of those exemplary lives.... Now, 'tis evident one of the best relics a devotee could procure would be the handiwork of a saint, and if his clothes and furniture are ever to be considered in this light, 'tis because they were once at his disposal, and were moved and affected by him; in which respect they are... connected with him by a shorter train of consequences than any of those from which we learn the reality of his existence. This phenomenon clearly proves that a present impression, with a relation of causation, may enliven any idea, and consequently produce belief or assent, according to the precedent definition of it... It has been remarked among the Mahometans as well as Christians that those pilgrims who have seen Mecca or the Holy Land are ever after more faithful and zealous believers than those who have not had that advantage. A man whose memory presents him with a lively image of the Red Sea and the Desert and Jerusalem and Galilee can never doubt of any miraculous events which are related either by Moses or the Evangelists. The lively idea of the places passes by an easy transition to the facts which are supposed to have been related to them by contiguity, and increases the belief by increasing the vivacity of the conception. The remembrance of those fields and rivers has the same influence as a new argument... The ceremonies of the Catholic religion may be considered as instances of the same nature. The devotees of that strange superstition usually plead in excuse for the mummeries with which they are upbraided that they feel the good effect of external motions and postures and actions in enlivening their devotion and quickening their fervor, which otherwise would decay, if directed entirely to distant and immaterial objects. We shadow out the objects of our faith, say they, in sensible types and images, and render them more present to us by the immediate presence of these types than it is possible for us to do merely by an intellectual view and contemplation."^[305]

Hume's cases are rather trivial; and the things which associated sensible objects make us believe in are supposed by him to be unreal. But all the more manifest for that is the fact of their psychological influence. Who does

not 'realize' more the fact of a dead or distant friend's existence, at the moment when a portrait, letter, garment or other material reminder of him is found? The whole notion of him then grows pungent and speaks to us and shakes us, in a manner unknown at other times. In children's minds, fancies and realities live side by side. But however lively their fancies may be, they still gain help from association with reality. The imaginative child identifies its *dramatis personæ* with some doll or other material object, and this evidently solidifies belief, little as it may resemble what it is held to stand for. A thing not too interesting by its own real qualities generally does the best service here. The most useful doll I ever saw was a large cucumber in the hands of a little Amazonian-Indian girl; she nursed it and washed it and rocked it to sleep in a hammock, and talked to it all day long—there was no part in life which the cucumber did not play. Says Mr. Tylor:

"An imaginative child will make a dog do duty for a horse, or a soldier for a shepherd, till at last the objective resemblance almost disappears, and a bit of wood may be dragged about, resembling a ship on the sea or a coach on the road. Here the likeness of the bit of wood to a ship or coach is very slight indeed; but it is a thing, and can be moved about,... and is an evident assistance to the child in enabling it to arrange and develop its ideas.... Of how much use... may be seen by taking it away, and leaving the child nothing to play with.... In later years and among highly educated people the mental process which goes on in a child's playing with wooden soldiers and horses, though it never disappears, must be sought for in more complex phenomena. Perhaps nothing in after-life more closely resembles the effect of a doll upon a child than the effect of the illustrations of a tale upon a grown reader. Here the objective resemblance is very indefinite... yet what reality is given to the scene by a good picture.... Mr. Backhouse one day noticed in Van Diemen's Land a woman arranging several stones that were flat, oval, and about two inches wide, and marked in various directions with black and red lines. These, he learned, represented absent friends, and one larger than the rest stood for a fat native woman on Flinder's Island, known by the name of Mother Brown. Similar practices are found among far higher races than the ill-fated Tasmanians. Among some North American tribes a mother who has lost a child keeps its memory ever present to her by filling its cradle with black feathers and

quills, and carrying it about with her for a year or more. When she stops anywhere, she sets up the cradle and talks to it as she goes about her work, just as she would have done if the dead body had been still alive within it. Here we have an image; but in Africa we find a rude doll representing the child, kept as a memorial.... Bastian saw Indian women in Peru who had lost an infant carrying about on their backs a wooden doll to represent it."^[306]

To many persons among us, photographs of lost ones seem to be fetishes. They, it is true, resemble; but the fact that the mere materiality of the reminder is almost as important as its resemblance is shown by the popularity a hundred years ago of the black taffeta 'silhouettes' which are still found among family relics, and of one of which Fichte could write to his affianced: *'Die Farbe fehlt, das Auge fehlt, es fehlt der himmlische Ausdruck deiner lieblichen Züge'*—and yet go on worshipping it all the same. The opinion so stoutly professed by many, that language is essential to thought, seems to have this much of truth in it, that all our inward images tend invincibly to attach themselves to something sensible, so as to gain in corporeity and life. Words serve this purpose, gestures serve it, stones, straws, chalk-marks, anything will do. As soon as anyone of these things stands for the idea, the latter seems to be more real. Some persons, the present writer among the number, can hardly lecture without a blackboard: the abstract conceptions must be symbolized by letters, squares or circles, and the relations between them by lines. All this symbolism, linguistic, graphic, and dramatic, has other uses too, for it abridges thought and fixes terms. But one of its uses is surely to rouse the believing reaction and give to the ideas a more living reality. As, when we are told a story, and shown the very knife that did the murder, the very ring whose hiding-place the clairvoyant revealed, the whole thing passes from fairy-land to mother-earth, so here we believe all the more, if only we see that 'the bricks are alive to tell the tale.'

So much for the prerogative position of sensations in regard to our belief. But among the sensations themselves all are not deemed equally real. The

more practically important ones, the more permanent ones, and the more aesthetically apprehensible ones are selected from the mass, to be believed in most of all; the others are degraded to the position of mere signs and suggestions of these. This fact has already been adverted to in former chapters.^[307] The real color of a thing is that one color-sensation which it gives us when most favorably lighted for vision. So of its real size, its real shape, etc.—these are but optical sensations selected out of thousands of others, because they have æsthetic characteristics which appeal to our convenience or delight. But I will not repeat what I have already written about this matter, but pass on to our treatment of tactile and muscular sensations, as 'primary qualities,' more real than those 'secondary' qualities which eye and ear and nose reveal. Why do we thus so markedly select the *tangible* to be the real? Our motives are not far to seek. The tangible qualities are the least fluctuating. When we get them at all we get them the same. The other qualities fluctuate enormously as our relative position to the object changes. Then, more decisive still, the tactile properties are those most intimately connected with our weal or woe. A dagger hurts us only when in contact with our skin, a poison only when we take it into our mouths, and we can only use an object for our advantage when we have it in our muscular control. It is as tangibles, then, that things concern us most; and the other senses, so far as their practical use goes, do but warn us of what tangible things to expect. They are but organs of anticipatory touch, as Berkeley has with perfect clearness explained.^[308]

Among all sensations, the *most* belief-compelling are those productive of pleasure or of pain. Locke expressly makes the *pleasure-* or *pain-*giving quality to be the ultimate human criterion of anything's reality. Discussing (with a supposed Berkeleyan before Berkeley) the notion that all our perceptions may be but a dream, he says:

"He may please to dream that I make him this answer... that I believe he will allow a very manifest difference between dreaming of being in the fire and being actually in it. But yet if he be resolved to appear so sceptical as to maintain that what I call being actually in the fire is nothing but a dream, and that we cannot thereby certainly know that any such thing as fire actually exists without us, I answer that we, certainly finding that pleasure or pain [or emotion of any sort] follows upon the application of certain objects to us, whose existence we

perceive, or dream that we perceive by our senses, *this certainly is as great as our happiness or misery*, beyond which we have no concernment to know or to be."^[309]

THE INFLUENCE OF EMOTION AND ACTIVE IMPULSE ON BELIEF.

The quality of arousing emotion, of shaking, moving us or inciting us to action, has as much to do with our belief in an object's reality as the quality of giving pleasure or pain. In [Chapter XXIV](#) I shall seek to show that our emotions probably owe their pungent quality to the bodily sensations which they involve. Our tendency to believe in emotionally exciting objects (objects of fear, desire, etc.) is thus explained without resorting to any fundamentally new principle of choice. Speaking generally, the more a conceived object *excites* us, the more reality it has. The same object excites us differently at different times. Moral and religious truths come 'home' to us far more on some occasions than on others. As Emerson says, "There is a difference between one and another hour of life in their authority and subsequent effect. Our faith comes in moments,... yet there is a depth in those brief moments which constrains us to ascribe more reality to them than to all other experiences." The 'depth' is partly, no doubt, the insight into wider systems of unified relation, but far more often than that it is the emotional thrill. Thus, to descend to more trivial examples, a man who has no belief in ghosts by daylight will temporarily believe in them when, alone at midnight, he feels his blood curdle at a mysterious sound or vision, his heart thumping, and his legs impelled to flee. The thought of falling when we walk along a curbstone awakens no emotion of dread; so no sense of reality attaches to it, and we are sure we shall not fall. On a precipice's edge, however, the sickening emotion which the notion of a possible fall engenders makes us believe in the latter's imminent reality, and quite unfits us to proceed.

The greatest proof that a man is *sui compos* is his ability to suspend belief in presence of an emotionally exciting idea. To give this power is the highest result of education. In untutored minds the power does not exist. *Every exciting thought in the natural man carries credence with it. To conceive with passion is eo ipso to affirm.* As Bagehot says:

"The Caliph Omar burnt the Alexandrian Library, saying: 'All books which contain what is not in the Koran are dangerous. All which contain what is in it are useless!' Probably no one ever had an intenser belief in anything than Omar had in this. Yet it is impossible to imagine it preceded by an argument. His belief in Mahomet, in the Koran, and in the sufficiency of the Koran, probably came to him in spontaneous rushes of emotion; there may have been little vestiges of argument floating here and there, but they did not justify the strength of the emotion, still less did they create it, and they hardly even excused it.... Probably, when the subject is thoroughly examined, conviction will be found to be one of the intensest of human emotions, and one most closely connected with the bodily state,... accompanied or preceded by the sensation that Scott makes his seer describe as the prelude of a prophecy:

'At length the fatal answer came,
In characters of living flame—
Not spoke in words, nor blazed in scroll,
But borne and branded on my soul.'

A hot flash seems to burn across the brain. Men in these intense states of mind have altered all history, changed for better or worse the creed of myriads, and desolated or redeemed provinces or ages. Nor is this intensity a sign of truth, for it is precisely strongest in those points in which men differ most from each other. John Knox felt it in his anti-Catholicism; Ignatius Loyola in his anti-Protestantism; and both, I suppose, felt it as much as it is possible to feel it."^[310]

The reason of the belief is undoubtedly the bodily commotion which the exciting idea sets up. 'Nothing which I can feel like *that* can be false.' All our religious and supernatural beliefs are of this order. The surest warrant for immortality is the yearning of our bowels for our dear ones; for God, the sinking sense it gives us to imagine no such Providence or help. So of our political or pecuniary hopes and fears, and things and persons dreaded and desired. "A grocer has a full creed as to foreign policy, a young lady a complete theory of the sacraments, as to which neither has any doubt.... A girl in a country parsonage will be sure that Paris never can be taken, or that Bismarck is a wretch"—all because they have either conceived these things at some moment with passion, or associated them with other things which they have conceived with passion.

M. Renouvier calls this belief of a thing for no other reason than that we conceive it with passion, by the name of *mental vertigo*.^[311] Other objects whisper doubt or disbelief; but the object of passion makes us deaf to all but itself, and we affirm it unhesitatingly. Such objects are the delusions of insanity, which the insane person can at odd moments steady himself against, but which again return to sweep him off his feet. Such are the revelations of mysticism. Such, particularly, are the sudden beliefs which animate mobs of men when frenzied impulse to action is involved. Whatever be the action in point—whether the stoning of a prophet, the hailing of a conqueror, the burning of a witch, the baiting of a heretic or Jew, the starting of a forlorn hope, or the flying from a foe—the fact that to believe a certain object will *cause that action to explode* is a sufficient reason for that belief to come. The motor impulse sweeps it unresisting in its train.

The whole history of witchcraft and early medicine is a commentary on the facility with which anything which chances to be conceived is believed the moment the belief chimes in with an emotional mood. 'The cause of sickness?' When a savage asks the cause of anything he means to ask exclusively 'What is to blame?' The theoretic curiosity starts from the practical life's demands. Let some one then accuse a necromancer, suggest a charm or spell which has been cast, and no more 'evidence' is asked for. What evidence is required beyond this intimate sense of the culprit's responsibility, to which our very viscera and limbs reply?^[312]

Human credulity in the way of therapeutics has similar psychological roots. If there is anything intolerable (especially to the heart of a woman), it is to do nothing when a loved one is sick or in pain. To do anything is a relief. Accordingly, whatever remedy may be suggested is a spark on inflammable soil. The mind makes its spring towards action on that cue, sends for that remedy, and for a day at least believes the danger past. Blame, dread, and hope are thus the great belief-inspiring passions, and cover among them the future, the present, and the past.

These remarks illustrate the earlier heads of the list on [page 292](#). Whichever represented objects give us sensations, especially interesting ones, or incite our motor impulses, or arouse our hate, desire, or fear, are real enough for us. Our requirements in the way of reality terminate in our own acts and emotions, our own pleasures and pains. These are the ultimate fixities from which, as we formerly observed, the whole chain of our beliefs depends, object hanging to object, as the bees, in swarming, hang to each other until, *de proche en proche*, the supporting branch, the Self, is reached and held.

BELIEF IN OBJECTS OF THEORY.

Now the merely conceived or imagined objects which our mind represents as hanging to the sensations (causing them, etc.), filling the gaps between them, and weaving their interrupted chaos into order are innumerable. Whole systems of them conflict with other systems, and our choice of which system shall carry our belief is governed by principles which are simple enough, however subtle and difficult may be their application to details. *The conceived system, to pass for true, must at least include the reality of the sensible objects in it, by explaining them as effects on us, if nothing more. The system which includes the most of them, and definitely explains or pretends to explain the most of them, will, ceteris paribus, prevail.* It is needless to say how far mankind still is from having excogitated such a system. But the various materialisms, idealisms, and hylozoisms show with what industry the attempt is forever made. It is conceivable that several rival theories should equally well include the actual order of our sensations in their scheme, much as the one-fluid and two-fluid theories of electricity formulated all the common electrical phenomena equally well. The sciences are full of these alternatives. Which theory is

then to be believed? *That theory will be most generally believed which, besides offering us objects able to account satisfactorily for our sensible experience, also offers those which are most interesting, those which appeal most urgently to our æsthetic, emotional, and active needs.* So here, in the higher intellectual life, the same selection among general conceptions goes on which went on among the sensations themselves. First, a word of their relation to our emotional and active needs—and here I can do no better than quote from an article published some years ago:^[313]

"A philosophy may be unimpeachable in other respects, but either of two defects will be fatal to its universal acceptance. First, its ultimate principle must not be one that essentially baffles and disappoints our dearest desires and most cherished powers. A pessimistic principle like Schopenhauer's incurably vicious Will-substance, or Hartmann's wicked jack-at-all-trades, the Unconscious, will perpetually call forth essays at other philosophies. Incompatibility of the future with their desires and active tendencies is, in fact, to most men a source of more fixed disquietude than uncertainty itself. Witness the attempts to overcome the 'problem of evil,' the 'mystery of pain.' There is no problem of 'good.'

"But a second and worse defect in a philosophy than that of contradicting our active propensities is to give them no Object whatever to press against. A philosophy whose principle is so incommensurate with our most intimate powers as to deny them all relevancy in universal affairs, as to annihilate their motives at one blow, will be even more unpopular than pessimism. Better face the enemy than the eternal Void! This is why materialism will always fail of universal adoption, however well it may fuse things into an atomistic unity, however clearly it may prophesy the future eternity. For materialism denies reality to the objects of almost all the impulses which we most cherish. The real *meaning* of the impulses, it says, is something which has no emotional interest for us whatever. But what is called extradition is quite as characteristic of our emotions as of our sense. Both point to an Object as the cause of the present feeling. What an intensely objective reference lies in fear! In like manner an enraptured man, a dreary-feeling man, are not simply aware of their subjective states; if they were, the force of their feelings would

evaporate. Both believe there is outward cause *why* they should feel as they do: either 'It is a glad world! how good is life!' or 'What a loathsome tedium is existence!' Any philosophy which annihilates the validity of the reference by explaining away its objects or translating them into terms of no emotional pertinency leaves the mind with little to care or act for. This is the opposite condition from that of nightmare, but when acutely brought home to consciousness it produces a kindred horror. In nightmare we have motives to act, but no power; here we have powers, but no motives. A nameless *Unheimlichkeit* comes over us at the thought of there being nothing eternal in our final purposes, in the objects of those loves and aspirations which are our deepest energies. The monstrously lopsided equation of the universe and its knower, which we postulate as the ideal of cognition, is perfectly paralleled by the no less lopsided equation of the universe and the *doer*. We demand in it a *character* for which our emotions and active propensities shall be a match. Small as we are, minute as is the point by which the Cosmos impinges upon each one of us, each one desires to feel that his reaction at that point is congruous with the demands of the vast whole, that he balances the latter, so to speak, and is able to do what it expects of him. But as his abilities to 'do' lie wholly in the line of his natural propensities; as he enjoys reaction with such emotions as fortitude, hope, rapture, admiration, earnestness, and the like; and as he very unwillingly reacts with fear, disgust, despair, or doubt,—a philosophy which should legitimate only emotions of the latter sort would be sure to leave the mind a prey to discontent and craving.

"It is far too little recognized how entirely the intellect is built up of practical interests. The theory of Evolution is beginning to do very good service by its reduction of all mentality to the type of reflex action. Cognition, in this view, is but a fleeting moment, a cross-section at a certain point of what in its totality is a motor phenomenon. In the lower forms of life no one will pretend that cognition is anything more than a guide to appropriate action. The germinal question concerning things brought for the first time before consciousness is not the theoretic 'What is that?' but the practical 'Who goes there?' or rather, as Horwicz has admirably put it, 'What is to be done?'—'*Was fang' ich an?*' In all our discussions about the intelligence of lower animals the only test we use is that of their *acting* as if for a purpose.

Cognition, in short, is incomplete until discharged in act. And although it is true that the later mental development, which attains its maximum through the hypertrophied cerebrum of man, gives birth to a vast amount of theoretic activity over and above that which is immediately ministerial to practice, yet the earlier claim is only postponed, not effaced, and the active nature asserts its rights to the end.

"If there be any truth at all in this view, it follows that however vaguely a philosopher may define the ultimate universal datum, he cannot be said to leave it unknown to us so long as he in the slightest degree pretends that our emotional or active attitude towards it should be of one sort rather than another. He who says, 'Life is real, life is earnest,' however much he may speak of the fundamental mysteriousness of things, gives a distinct definition to that mysteriousness by ascribing to it the right to claim from us the particular mood called seriousness, which means the willingness to live with energy, though energy bring pain. The same is true of him who says that all is vanity. Indefinable as the predicate vanity may be *in se*, it is clearly enough something which permits anæsthesia, mere escape from suffering, to be our rule of life. There is no more ludicrous incongruity than for agnostics to proclaim with one breath that the substance of things is unknowable, and with the next that the thought of it should inspire us with admiration of its glory, reverence, and a willingness to add our co-operative push in the direction towards which its manifestations seem to be drifting. The unknowable may be unfathomed, but if it make such distinct demands upon our activity, we surely are not ignorant of its essential quality.

"If we survey the field of history and ask what feature all great periods of revival, of expansion of the human mind, display in common, we shall find, I think, simply this: that each and all of them have said to the human being, 'The inmost nature of the reality is congenial to *powers* which you possess.' In what did the emancipating message of primitive Christianity consist, but in the announcement that God recognizes those weak and tender impulses which paganism had so rudely overlooked? Take repentance: the man who can do nothing rightly can at least repent of his failures. But for paganism this faculty of repentance was a pure supernumerary, a straggler too late for the

fair. Christianity took it and made it the one power within us which appealed straight to the heart of God. And after the night of the Middle Ages had so long branded with obloquy even the generous impulses of the flesh, and defined the Reality to be such that only slavish natures could commune with it, in what did the *Sursum corda!* of the Renaissance lie but in the proclamation that the archetype of verity in things laid claim on the widest activity of our whole æsthetic being? What were Luther's mission and Wesley's but appeals to powers which even the meanest of men might carry with them, faith and self-despair, but which were personal, requiring no priestly intermediation, and which brought their owner face to face with God? What caused the wild-fire influence of Rousseau but the assurance he gave that man's nature was in harmony with the nature of things, if only the paralyzing corruptions of custom would stand from between? How did Kant and Fichte, Goethe and Schiller, inspire their time with cheer, except by saying, 'Use all your powers; that is the only obedience which the universe exacts'? And Carlyle with his gospel of Work, of Fact, of Veracity, how does he move us except by saying that the universe imposes no tasks upon us but such as the most humble can perform? Emerson's creed that everything that ever was or will be is here in the enveloping Now; that man has but to obey himself—'He who will rest in what he *is*, is a part of Destiny'—is in like manner nothing but an exorcism of all scepticism as to the pertinency of one's natural faculties.

"In a word, 'Son of Man, *stand upon thy feet* and I will speak unto thee!' is the only revelation of truth to which the solving epochs have helped the disciple. But that has been enough to satisfy the greater part of his rational need. *In se* and *per se* the universal essence has hardly been more defined by any of these formulæ than by the agnostic *x*; but the mere assurance that my powers, such as they are, are not irrelevant to it, but pertinent, that it speaks to them and will in some way recognize their reply, that I can be a match for it if I will, and not a footless waif, suffices to make it rational to my feeling in the sense given above. Nothing could be more absurd than to hope for the definitive triumph of any philosophy which should refuse to legitimate, and to legitimate in an emphatic manner, the more powerful of our emotional and practical tendencies. Fatalism, whose solving

word in all crises of behavior is 'All striving is vain,' will never reign supreme, for the impulse to take life strivingly is indestructible in the race. Moral creeds which speak to that impulse will be widely successful in spite of inconsistency, vagueness, and shadowy determination of expectancy. Man needs a rule for his will, and will invent one if one be not given him."

After the emotional and active needs come the intellectual and æsthetic ones. The two great æsthetic principles, of richness and of ease, dominate our intellectual as well as our sensuous life. And, *ceteris paribus*, no system which should not be rich, simple, and harmonious would have a chance of being chosen for belief, if rich, simple, and harmonious systems were also there. Into the latter we should unhesitatingly settle, with that welcoming attitude of the will in which belief consists. To quote from a remarkable book:

"This law that our consciousness constantly tends to the minimum of complexity and to the maximum of definiteness, is of great importance for all our knowledge.... Our own activity of attention will thus determine what we are to know and what we are to believe. If things have more than a certain complexity, not only will our limited powers of attention forbid us to unravel this complexity, but we shall strongly desire to believe the things much simpler than they are. For our thoughts about them will have a constant tendency to become as simple and definite as possible. Put a man into a perfect chaos of phenomena—sounds, sights, feelings—and if the man continued to exist, and to be rational at all, his attention would doubtless soon find for him away to make up some kind of rhythmic regularity, which he would impute to the things about him, so as to imagine that he had discovered some laws of sequence in this mad new world. And thus, in every case where we fancy ourselves sure of a simple law of Nature, we must remember that a great deal of the fancied simplicity may be due, in the given case, not to Nature, but to the ineradicable prejudice of our own minds in favor of regularity and simplicity. All our thoughts are determined, in great measure, by this law of least effort, as it is found exemplified in our activity of attention.... The aim of the whole process seems to be to reach as complete and united a

conception of reality as possible, a conception wherein the greatest fulness of data shall be combined with the greatest simplicity of conception. The effort of consciousness seems to be to combine the greatest richness of content with the greatest definiteness of organization."^[314]

The richness is got by including all the facts of sense in the scheme; the simplicity, by deducing them out of the smallest possible number of permanent and independent primordial entities: the definite organization, by assimilating these latter to ideal objects between which relations of an inwardly rational sort obtain. What these ideal objects and rational relations are will require a separate chapter to show.^[315] Meanwhile, enough has surely been said to justify the assertion made above that no general off-hand answer can be given as to which objects mankind shall choose as its realities. The fight is still under way. Our minds are yet chaotic; and at best we make a mixture and a compromise, as we yield to the claim of this interest or that, and follow first one and then another principle in turn. It is undeniably true that materialistic, or so-called 'scientific,' conceptions of the universe have so far gratified the purely intellectual interests more than the mere sentimental conceptions have. But, on the other hand, as already remarked, they leave the emotional and active interests cold. *The perfect object of belief would be a God or 'Soul of the World,' represented both optimistically and moralistically (if such a combination could be), and withal so definitely conceived as to show us why our phenomenal experiences should be sent to us by Him in just the very way in which they come.* All Science and all History would thus be accounted for in the deepest and simplest fashion. The very room in which I sit, its sensible walls and floor, and the feeling the air and fire within it give me, no less than the 'scientific' conceptions which I am urged to frame concerning the mode of existence of all these phenomena when my back is turned, would then all be corroborated, not de-realized, by the ultimate principle of my belief. The World-soul sends me just those phenomena in order that I may react upon them; and among the reactions is the intellectual one of spinning these conceptions. What is beyond the crude experiences is not an *alternative* to them, but something that *means* them for me here and now. It is safe to say that, if ever such a system is satisfactorily excogitated, mankind will drop all other systems and cling to that one alone as real.

Meanwhile the other systems coexist with the attempts at that one, and, all being alike fragmentary, each has its little audience and day.

I have now, I trust, shown sufficiently what the psychologic sources of the sense of reality are. Certain postulates are given in our nature; and whatever satisfies those postulates is treated as if real.^[316] I might therefore finish the chapter here, were it not that a few additional words will set the truth in a still clearer light.

DOUBT.

There is hardly a common man who (if consulted) would not say that things come to us in the first instance *as ideas*; and that if we take them for realities, it is because we *add something to them*, namely, the predicate of having also '*real existence outside of our thought*.' This notion that a higher faculty than the mere *having* of a conscious content is needed to make us know anything real by its means has pervaded psychology from the earliest times, and is the tradition of Scholasticism, Kantism, and Common-sense. Just as sensations must come as inward affections and then be 'extradited;' as objects of memory must appear at first as presently unrealities, and subsequently be 'projected' backwards as past realities; so conceptions must be *entia rationis* till a higher faculty uses them as windows to look beyond the ego, into the real *extra-mental* world;—so runs the orthodox and popular account.

And there is no question that this is a true account of the way in which many of our later beliefs come to pass. The logical distinction between the bare thought of an object and belief in the object's reality is often a chronological distinction as well. The having and the crediting of an idea do not always coalesce; for often we first suppose and then believe; first play with the notion, frame the hypothesis, and then affirm the existence, of an object of thought. And we are quite conscious of the succession of the two mental acts. But these cases are none of them *primitive* cases. They only occur in minds long schooled to doubt by the contradictions of experience. *The primitive impulse is to affirm immediately the reality of all that is*

conceived.^[317] When we do doubt, however, in what does the subsequent resolution of the doubt consist? It either consists in a purely verbal performance, the coupling of the adjectives 'real' or 'outwardly existing' (as predicates) to the thing originally conceived (as subject); or it consists in the perception in the given case of *that for which these adjectives*, abstracted from other similar concrete cases, *stand*. But what these adjectives stand for, we now know well. They stand for certain relations (immediate, or through intermediaries) to ourselves. Whatever concrete objects have hitherto stood in those relations have been for us 'real,' 'outwardly existing.' So that when we now abstractly admit a thing to be 'real' (without perhaps going through any definite perception of its relations), it is as if we said "it belongs in the same world with those other objects." Naturally enough, we have hourly opportunities for this summary process of belief. All remote objects in space or time are believed in this way. When I believe that some prehistoric savage chipped this flint, for example, the reality of the savage and of his act makes no direct appeal either to my sensation, emotion, or volition. What I mean by my belief in it is simply my dim sense of a *continuity* between the long dead savage and his doings and the present world of which the flint forms part. It is pre-eminently a case for applying our doctrine of the 'fringe' (see Vol I. p. 258). When I think the savage with one fringe of relationship, I believe in him; when I think him without that fringe, or with another one (as, e.g., if I should class him with 'scientific vagaries' in general), I disbelieve him. The word 'real' itself is, in short, a fringe.

RELATIONS OF BELIEF AND WILL.

We shall see in [Chapter XXV](#) that will consists in nothing but a manner of attending to certain objects, or consenting to their stable presence before the mind. The objects, in the case of will, are those whose existence depends on our thought, movements of our own body for example, or facts which such movements executed in future may make real. Objects of belief, on the contrary, are those which do not change according as we think regarding them. I *will* to get up early to-morrow morning; I *believe* that I got up late yesterday morning; I *will* that my foreign bookseller in Boston shall procure me a German book and write to him to that effect. I *believe* that he will make me pay three dollars for it when it comes, etc. Now the important

thing to notice is that this difference between the objects of will and belief is entirely immaterial, as far as the relation of the mind to them goes. All that the mind does is in both cases the same; it looks at the object and consents to its existence, espouses it, says 'it shall be my reality.' It turns to it, in short, in the interested active emotional way. The rest is done by nature, which in some cases *makes* the objects real which we think of in this manner, and in other cases does not. Nature cannot change the past to suit our thinking. She cannot change the stars or the winds; but she *does* change our bodies to suit our thinking, and through their instrumentality changes much besides; so the great practical distinction between objects which we may will or unwill, and objects which we can merely believe or disbelieve, grows up, and is of course one of the most important distinctions in the world. Its roots, however, do not lie in psychology, but in physiology; as the chapter on Volition will abundantly make plain. *Will and Belief, in short, meaning a certain relation between objects and the Self, are two names for one and the same PSYCHOLOGICAL phenomenon.* All the questions which arise concerning one are questions which arise concerning the other. The causes and conditions of the peculiar relation must be the same in both. The free-will question arises as regards belief. If our wills are indeterminate, so must our beliefs be, etc. The first act of free-will, in short, would naturally be to believe in free-will, etc. In [Chapter XXVI](#), I shall mention this again.

A practical observation may end this chapter. If belief consists in an emotional reaction of the entire man on an object, how *can* we believe at will? We cannot control our emotions. Truly enough, a man cannot believe at will abruptly. Nature sometimes, and indeed not very infrequently, produces instantaneous conversions for us. She suddenly puts us in an active connection with objects of which she had till then left us cold. "I realize for the first time," we then say, "what that means!" This happens often with moral propositions. We have often heard them; but now they shoot into our lives; they move us; we feel their living force. Such instantaneous beliefs are truly enough not to be achieved by will. But *gradually* our will can lead us to the same results by a very simple method: *we need only in cold blood ACT as if the thing in question were real, and*

keep acting as if it were real, and it will infallibly end by growing into such a connection with our life that it will become real. It will become so knit with habit and emotion that our interests in it will be those which characterize belief. Those to whom 'God' and 'Duty' are now mere names can make them much more than that, if they make a little sacrifice to them every day. But all this is so well known in moral and religious education that I need say no more.^[318]

[287] Reprinted, with additions, from 'Mind' for July 1889.

[288] Compare this psychological fact with the corresponding logical truth that all negation rests on covert assertion of something else than the thing denied. (See Bradley's Principles of Logic, bk. i. ch. 3.)

[289] See that very remarkable little work, 'The Anæsthetic Revelation and the Gist of Philosophy,' by Benj. P. Blood (Amsterdam, N. Y., 1874). Compare also Mind, vii. 206.

[290] "To one whose mind is healthy thoughts come and go unnoticed; with me they have to be faced, thought about in a peculiar fashion, and then disposed of as finished, and this often when I am utterly wearied and would be at peace; but the call is imperative. This goes on to the hindrance of all natural action. If I were told that the staircase was on fire and I had only a minute to escape, and the thought arose—'Have they sent for fire-engines? Is it probable that the man who has the key is on hand? Is the man a careful sort of person? Will the key be hanging on a peg? Am I thinking rightly? Perhaps they don't lock the depot'—my foot would be lifted to go down; I should be conscious to excitement that I was losing my chance; but I should be unable to stir until all these absurdities were entertained and disposed of. In the most critical moments of my life, when I ought to have been so *engrossed as to leave no room for any secondary thoughts*, I have been oppressed by the inability to be at peace. And in the most ordinary circumstances it is all the same. Let me instance the other morning I went to walk. The day was biting cold, but I was unable to proceed except by jerks. Once I got arrested, my feet in a muddy pool. One foot was lifted to go, knowing that it was not good to be standing in water, but there I was fast, the cause of detention being the discussing with myself the reasons why I should not stand in that pool." (T. S. Clouston, Clinical Lectures on Mental Diseases, 1883, p. 43. See also Berger, in Archiv f. Psychiatrie, vi. 217.)

[291] Note to Jas. Mill's Analysis, i. 412-428.

[292] For an excellent account of the history of opinion on this subject see A. Marty, in Vierteljahrsch. f. wiss. Phil., viii. 181 ff. (1884).

[293] We saw near the end of [Chapter XIX](#) that a candle-image taking exclusive possession of the mind in this way would probably acquire the sensational vividness. But this physiological accident is logically immaterial to the argument in the text, which ought to apply as well to the dimmest sort of mental image as to the brightest sensation.

[294] In both existential and attributive judgments a synthesis is represented. The syllable *ex* in the word Existence, *da* in the word *Dasein*, express it. 'The candle exists' is equivalent to 'The candle is *over there*.' And the 'over there' means real space, space related to other reals. The proposition amounts to saying: 'The candle is in the same space with other reals.' It affirms of the candle a very

concrete predicate—namely, this relation to other particular concrete things. *Their* real existence, as we shall later see, resolves itself into their peculiar relation to *ourselves*. Existence is thus no substantive quality when we predicate it of any object; it is a relation, ultimately terminating in ourselves, and at the moment when it terminates, becoming a *practical* relation. But of this more anon. I only wish now to indicate the superficial nature of the distinction between the existential and the attributive proposition.

[295] I define the scientific universe here in the radical mechanical way. Practically, it is oftener thought of in a mongrel way and resembles in more points the popular physical world.

[296] It thus comes about that we can say such things as that Ivanhoe did not *really* marry Rebecca, as Thackeray *falsely* makes him do. The real Ivanhoe-world is the one which Scott wrote down for us. *In that world* Ivanhoe does *not* marry Rebecca. The objects within that world are knit together by perfectly definite relations, which can be affirmed or denied. Whilst absorbed in the novel, we turn our backs on all other worlds, and, for the time, the Ivanhoe-world remains our absolute reality. When we wake from the spell, however, we find a still more real world, which reduces Ivanhoe, and all things connected with him, to the Active status, and relegates them to one of the sub-universes grouped under No. 5.

[297] The world of dreams is our real world whilst we are sleeping, because our attention then lapses from the sensible world. Conversely, when we wake the attention usually lapses from the dream-world and that becomes unreal. But if a dream haunts us and compels our attention during the day it is very apt to remain figuring in our consciousness as a sort of sub-universe alongside of the waking world. Most people have probably had dreams which it is hard to imagine not to have been glimpses into an actually existing region of being, perhaps a corner of the 'spiritual world.' And dreams have accordingly in all ages been regarded as revelations, and have played a large part in furnishing forth mythologies and creating themes for faith to lay hold upon. The 'larger universe,' here, which helps us to believe both in the dream and in the waking reality which is its immediate reductive, is the *total* universe, of Nature *plus* the Supernatural. The dream holds true, namely, in one half of that universe; the waking perceptions in the other half. Even to-day dream-objects figure among the realities in which some 'psychic-researchers' are seeking to rouse our belief. All our theories, not only those about the supernatural, but our philosophic and scientific theories as well, are like our dreams in rousing such different degrees of belief in different minds.

[298] Distinguishes realities from unrealities, the essential from the rubbishy and neglectable.

[299] Inquiry concerning Hum. Understanding, sec. v. pt. 2 (slightly transposed in my quotation).

[300] Note to Jas. Mill's Analysis, i. 394.

[301] Critique of Pure Reason, trans. Müller, ii. 515-17. Hume also: "When, after the simple conception of anything, we would conceive it as existent, we in reality make no addition to, or alteration of, our first idea. Thus, when we affirm that God is existent, we simply form the idea of such a being as He is represented to us; nor is the existence which we attribute to Him conceived by a particular idea, which we join to His other qualities, and can again separate and distinguish from them.... The belief of the existence joins no new idea to those which compose the ideas of the object. When I think of God, when I think of Him as existent, and when I believe Him to be existent, my idea of Him neither increases nor diminishes. But as 'tis certain there is a great difference betwixt the simple conception of the existence of an object and the belief of it, and as this difference lies not in the facts or compositions of the idea which we conceive, it follows that it must lie in the manner in which we conceive it." (Treatise of Human Nature, pt. iii. sec. 7.)

[302] I use the notion of the Ego here, as common-sense uses it. Nothing is prejudged as to the results (or absence of results) of ulterior attempts to analyze the notion.

[303] Griesinger, *Mental Diseases*, §§ 50, 98. The neologism we so often hear, that an experience 'gives us a *realising sense*' of the truth of some proposition or other, illustrates the dependence of the sense of reality upon *excitement*. Only what stirs us is 'realized.'

[304] The way in which sensations are pitted against systematized conceptions, and in which the one or the other then prevails according as the sensations are felt by ourselves or merely known by report, is interestingly illustrated at the present day by the state of public belief about 'spiritualistic' phenomena. There exist numerous narratives of movement without contact on the part of articles of furniture and other material objects, in the presence of certain privileged individuals called mediums. Such movement violates our memories, and the whole system of accepted physical 'science.' Consequently those who have not seen it either brand the narratives immediately as lies or call the phenomena 'illusions' of sense, produced by fraud or due to hallucination. But one who has actually seen such a phenomenon, under what seems to him sufficiently 'test-conditions,' will hold to his sensible experience through thick and thin, even though the whole fabric of 'science' should be rent in twain. That man would be a weak-spirited creature indeed who should allow any fly-blown generalities about 'the liability of the senses to be deceived' to bully him out of his adhesion to what for him was an indubitable experience of sight. A man may err in this obstinacy, sure enough, in any particular case. But the spirit that animates him is that on which ultimately the very life and health of Science rest.

[305] *Treatise of Human Nature*, bk. i. pt. iii. sec. 7.

[306] *Early Hist. of Mankind*, p. 108.

[307] See Vol. I. pp. 285-6; Vol. II. pp. 237 ff.

[308] See *Theory of Vision*, § 59.

[309] *Essay*, bk. iv. chap. 2, § 14. In another place: "He that sees a candle burning and hath experimented the force of its flame by putting his finger into it, will little doubt that this is something existing without him, which does him harm and puts him to great pain.... And if our dreamer pleases to try whether the glowing heat of a glass furnace be barely a wandering imagination in a drowsy man's fancy by putting his hand into it, he may, perhaps, be awakened into a certainty greater than he could wish, that it is something more than bare imagination. So that the evidence is as great as we can desire, being as certain to us as our pleasure or pain, i.e. happiness or misery; beyond which we have no concernment, either of knowledge or being. Such an assurance of the existence of things without us is sufficient to direct us in the attaining the good and avoiding the evil which is caused by them, which is the important concernment we have of being made acquainted with them," (*Ibid.* bk. iv. chap. 11, § 8.)

[310] W. Bagehot, 'The Emotion of Conviction,' *Literary Studies*, i. 412-17.

[311] *Psychologie Rationnelle*, ch. 12.

[312] Two examples out of a thousand:

Reid, *Inquiry*, ch. ii. § 9: "I remember, many years ago, a white ox was brought into the country, of so enormous size that people came many miles to see him. There happened, some months after, an uncommon fatality among women in child-bearing. Two such uncommon events, following one another, gave a suspicion of their connection, and occasioned a common opinion among the country people that the white ox was the cause of this fatality."

H. M. Stanley, *Through the Dark Continent*, ii. 388: "On the third day of our stay at Mowa, feeling quite comfortable amongst the people, on account of their friendly bearing, I began to write in my note-book the terms for articles, in order to improve my already copious vocabulary of native words. I had proceeded only a few minutes when I observed a strange commotion amongst the people who

had been flocking about me, and presently they ran away. In a short time we heard war-cries ringing loudly and shrilly over the table-land. Two hours afterwards a long line of warriors were seen descending the table-land and advancing towards our camp. There may have been between five and six hundred of them. We, on the other hand, had made but few preparations except such as would justify us replying to them in the event of the actual commencement of hostilities. But I had made many firm friends among them, and I firmly believed that I should be able to avert an open rupture. When they had assembled at about a hundred yards in front of our camp, Safeni and I walked up towards them and sat down midway. Some half-dozen of the Mowa people came near, and the shauri began.

"What is the matter, my friends?" I asked. "Why do you come with guns in your hands, in such numbers, as though you were coming to fight? Fight? fight us, your friends! Tut! this is some great mistake, surely."

"Mundele," replied one of them, "... 'our people saw you yesterday make marks on some tara-tara [paper]. This is very bad. Our country will waste, our goats will die, our bananas will rot, and our women will dry up. What have we done to you that you should wish to kill us? We have sold you food and we have brought you wine each day. Your people are allowed to wander where they please without trouble. Why is the Mundele so wicked? We have gathered together to fight you if you do not burn that tara-tara now before our eyes. If you burn it we go away, and shall be your friends as heretofore.'

"I told them to rest there, and left Safeni in their hands as a pledge that I should return. My tent was not fifty yards from the spot, but while going towards it my brain was busy in devising some plan to foil this superstitious madness. My note-book contained a vast number of valuable notes.... I could not sacrifice it to the childish caprice of savages. As I was rummaging my book-box, I came across a volume of Shakespeare [Chandos edition] much worn, and well thumbed, and which was of the same size as my field-book; its cover was similar also, and it might be passed for the field-book, provided that no one remembered its appearance too well. I took it to them. 'Is this the tara-tara, friends, that you wish burned?'

"Yes, yes, that is it."

"Well, take it, and burn it, or keep it."

"M—m. No, no, no. We will not touch it. It is fetish. You must burn it."

"I! Well, let it be so. I will do anything to please my good friends of Mowa."

"We walked to the nearest fire. I breathed a regretful farewell to my genial companion, which, during my many weary hours of night, had assisted to relieve my mind when oppressed by almost intolerable woes, and then gravely consigned the innocent Shakespeare to the flames, heaping the brush fuel over it with ceremonious care.

"A-h-h," breathed the poor deluded natives sighing their relief.... "There is no trouble now!... And something approaching to a cheer was shouted among them, which terminated the episode of the burning of Shakespeare."

[313] 'Rationality, Activity, and Faith' (Princeton Review, July 1882, pp. 64-9).

[314] J. Royce, *The Religious Aspect of Philosophy* (Boston, 1885). pp. 317-57.

[315] [Chapter XXVII](#).

[316] Prof. Royce puts this well in discussing idealism and the reality of an 'external' world. "If the history of popular speculation on these topics could be written, how much of cowardice and shuffling would be found in the behavior of the natural mind before the question, 'How dost thou know of an external reality?' Instead of simply and plainly answering: 'I mean by the external world in the first place something that I accept or demand, that I posit, postulate, actively construct on the basis of sense-data,' the natural man gives us all kinds of vague compromise answers.... Where shall these endless turnings and twistings have an end?... All these lesser motives are appealed to, and the one ultimate motive is neglected. The ultimate motive with the man of every-day life is the *will to have an external world*. Whatever consciousness contains, reason will persist in spontaneously adding the thought: 'But there *shall be* something beyond this.'... The popular assurance of an external world is the *fixed determination to make one*, now and henceforth." (*Religious Aspect of Philosophy*, p. 304—the italics are my own.) This immixture of the will appears most flagrantly in the fact that although external matter is doubted commonly enough, minds external to our own are never doubted. We need them too much, are too essentially social to dispense with them. Semblances of matter may suffice to react upon, but not semblances of communing souls. A psychic solipsism is too hideous a mockery of our wants, and, so far as I know, has never been seriously entertained.—Chapters ix and x of Prof. Royce's work are on the whole the clearest account of the psychology of belief with which I am acquainted.

[317] "The leading fact in Belief, according to my view of it, is our Primitive Credulity. We begin by believing everything; whatever is, is true.... The animal born in the morning of a summer day proceeds upon the fact of daylight; assumes the perpetuity of that fact. Whatever it is disposed to do, it does without misgivings. If in the morning it began a round of operations continuing for hours, under the full benefit of daylight, it would unhesitatingly begin the same round in the evening. Its state of mind is practically one of unbounded confidence; but, as yet, it does not understand what confidence means.

"The pristine assurance is soon met by checks; a disagreeable experience leading to new insight. To be thwarted and opposed is one of our earliest and most frequent pains. It develops the sense of a distinction between free and obstructed impulses; the unconsciousness of an open way is exchanged for consciousness; we are now said properly to believe in what has never been contradicted, as we disbelieve in what has been contradicted. We believe that, after the dawn of day, there is before us a continuance of light; we do not believe that this light is to continue forever.

"Thus, the vital circumstance in belief is never to be contradicted—never to lose *prestige*. The number of repetitions counts for little in the process: we are as much convinced after ten as after fifty; we are more convinced by ten unbroken than by fifty for and one against." (Bain: *The Emotions and the Will*, pp. 511, 512.)

[318] *Literature*. D. Hume: *Treatise on Human Nature*, part iii. §§ vii-x. A. Bain: *Emotions and Will*, chapter on Belief (also pp. 20 ff.). J. Sully: *Sensation and Intuition*, essay iv. J. Mill: *Analysis of Human Mind*, chapter xi. Ch. Renouvier: *Psychologie Rationnelle*, vol. ii. pt. ii. and *Esquisse d'une Classification systématique des Doctrines Philosophiques*, part vi. J. H. Newman: *The Grammar of Assent*. J. Venn: *Some Characteristics of Belief*. V. Brochard: *De l'Erreur*, part ii. chap. vi, ix; and *Revue Philosophique*, xxviii. 1. E. Rabier: *Psychologie*, chap xxi. Appendix. Ollé Lapruné: *La Certitude Morale* (1881). G. F. Stout: *On Genesis of Cognition of Physical Reality*, in 'Mind,' Jan. 1890. J. Pikler: *The Psychology of the Belief in Objective Existence* (London, 1890).—Mill says that we believe present sensations; and makes our belief in all other things a matter of *association* with

these. So far so good; but as he makes no mention of emotional or volitional reaction, Bain rightly charges him with treating belief as a purely intellectual state. For Bain belief is rather an incident of our active life. When a thing is such as to make us *act* on it, then we believe it, according to Bain. "But how about past things, or remote things, upon which no reaction of ours is possible? And how about belief in things which *check* action?" says Sully; who considers that we believe a thing only when "the idea of it has an inherent tendency to approximate in character and intensity to a sensation." It is obvious that each of these authors emphasizes a true aspect of the question. My own account has sought to be more complete, sensation, association, and active reaction all being acknowledged to be concerned. The most compendious possible formula perhaps would be that *our belief and attention* are the same fact. For the moment, what we attend to is reality; Attention is a motor reaction; and we are so made that sensations force attention from us. On Belief and Conduct see an article by Leslie Stephen, Fortnightly Review, July 1888.

A set of facts have been recently brought to my attention which I hardly know how to treat, so I say a word about them in this foot-note. I refer to a type of experience which has frequently found a place amongst the 'Yes' answers to the 'Census of Hallucinations,' and which is generally described by those who report it as an 'impression of the presence' of someone near them, although no sensation either of sight, hearing, or touch is involved. From the way in which this experience is spoken of by those who have had it, it would appear to be an extremely definite and positive state of mind, coupled with a belief in the reality of its object quite as strong as any direct sensation ever gives. And yet *no* sensation seems to be connected with it at all. Sometimes the person whose nearness is thus impressed is a known person, dead or living, sometimes an unknown one. His attitude and situation are often very definitely impressed, and so, sometimes (though not by way of hearing), are words which he wishes to say.

The phenomenon would seem to be due to a pure *conception* becoming saturated with the sort of stinging urgency which ordinarily only sensations bring. But I cannot yet persuade myself that the urgency in question consists in concomitant emotional and motor impulses. The 'impression' may come quite suddenly and depart quickly; it may carry no emotional suggestions, and wake no motor consequences beyond those involved in attending to it. Altogether, the matter is somewhat paradoxical, and no conclusion can be come to until more definite data are obtained.

Perhaps the most curious case of the sort which I have received is the following. The subject of the observation, Mr. P., is an exceptionally intelligent witness, though the words of the narrative are his wife's.

"Mr. P. has all his life been the occasional subject of rather singular delusions or impressions of various kinds. If I had belief in the existence of latent or embryo faculties, other than the five senses, I should explain them on that ground. Being totally blind, his other perceptions are abnormally keen and developed, and given the existence of a rudimentary sixth sense, it would be only natural that this also should be more acute in him than in others. One of the most interesting of his experiences in this line was the frequent apparition of a corpse some years ago, which may be worth the attention of your Committee on that subject. At the time Mr. P. had a music-room in Boston on Beacon Street, where he used to do severe and protracted practice with little interruption. Now, all one season it was a very familiar occurrence with him while in the midst of work to feel a cold draft of air suddenly upon his face, with a prickling sensation at the roots of his hair, when he would turn from the piano, and a figure which he knew to be dead would come sliding under the crack of the door from without, flattening itself to squeeze through and rounding out again to the human form. It was of a middle-aged man, and drew itself along the carpet on hands and knees, but with head thrown back till it reached the sofa, upon which it stretched itself. It remained some moments, but vanished always if Mr. P. spoke or made a decided movement. The most singular point in the occurrence was its frequent repetition. He might expect it on any day between two and four o'clock, and it came always heralded by the same sudden cold shiver, and was invariably the same figure which went through the same

movements. He afterwards traced the whole experience to strong tea. He was in the habit of taking cold tea, which always stimulates him, for lunch, and on giving up this practice he never saw this or any other apparition again. However, even allowing, as is doubtless true, that the event was a delusion of nerves first fatigued by overwork and then excited by this stimulant, there is one point which is still wholly inexplicable and highly interesting to me. Mr. P. has no memory whatever of sight, nor conception of it. It is impossible for him to form any idea of what we mean by light or color, consequently he has no cognizance of any object which does not reach his sense of hearing or of touch, though these are so acute as to give a contrary impression sometimes to other people. When he becomes aware of the presence of a person or an object, by means which seem mysterious to outsiders, he can always trace it naturally and legitimately to slight echoes, perceptible only to his keen ears, or to differences in atmospheric pressure, perceptible only to his acute nerves of touch; but with the apparition described, for the only time in his experience, he was aware of presence, size, and appearance, without the use of either of these mediums. The figure never produced the least sound nor came within a number of feet of his person, yet he knew that it was a man, that it moved, and in what direction, even that it wore a full beard, which, like the thick curly hair, was partially gray; also that it was dressed in the style of suit known as 'pepper and salt.' These points were all perfectly distinct and invariable each time. If asked how he perceived them, he will answer he cannot tell, he simply knew it, and so strongly and so distinctly that it is impossible to shake his opinion as to the exact details of the man's appearance. It would seem that in this delusion of the senses he really *saw*, as he has never done in the actual experiences of life, except in the first two years of childhood."

On cross-examining Mr. P., I could not make out that there was anything like visual imagination involved, although he was quite unable to describe in just what terms the false perception was carried on. It seemed to be more like an intensely definite *conception* than anything else, a conception to which the feeling of *present reality* was attached, but in no such shape as easily to fall under the heads laid down in my text.

CHAPTER XXII.^[319]

REASONING.

We talk of man being the rational animal; and the traditional intellectualist philosophy has always made a great point of treating the brutes as wholly irrational creatures. Nevertheless, it is by no means easy to decide just what is meant by reason, or how the peculiar thinking process called reasoning differs from other thought-sequences which may lead to similar results.

Much of our thinking consists of trains of images suggested one by another, of a sort of spontaneous revery of which it seems likely enough that the higher brutes should be capable. This sort of thinking leads nevertheless to rational conclusions, both practical and theoretical. The links between the terms are either 'contiguity' or 'similarity,' and with a mixture of both these

things we can hardly be very incoherent. As a rule, in this sort of irresponsible thinking, the terms which fall to be coupled together are empirical concretes, not abstractions. A sunset may call up the vessel's deck from which I saw one last summer, the companions of my voyage, my arrival into port, etc.; or it may make me think of solar myths, of Hercules' and Hector's funeral pyres, of Homer and whether he could write, of the Greek alphabet, etc. If habitual contiguities predominate, we have a prosaic mind; if rare contiguities, or similarities, have free play, we call the person fanciful, poetic, or witty. But the thought as a rule is of matters taken in their entirety. Having been thinking of one, we find later that we are thinking of another, to which we have been lifted along, we hardly know how. If an abstract quality figures in the procession, it arrests our attention but for a moment, and fades into something else; and is never very abstract. Thus, in thinking of the sun-myths, we may have a gleam of admiration at the gracefulness of the primitive human mind, or a moment of disgust at the narrowness of modern interpreters. But, in the main, we think less of qualities than of whole things, real or possible, just as we may experience them.

The upshot of it may be that we are reminded of some practical duty: we write a letter to a friend abroad, or we take down the lexicon and study our Greek lesson. Our thought is rational, and leads to a rational act, but it can hardly be called reasoning in a strict sense of the term.

There are other shorter flights of thought, single couplings of terms which suggest one another by association, which approach more to what would commonly be classed as acts of reasoning proper. Those are where a present sign suggests an unseen, distant, or future reality. Where the sign and what it suggests are both concretes which have been coupled together on previous occasions, the inference is common to both brutes and men, being really nothing more than association by contiguity. A and B, dinner-bell and dinner, have been experienced in immediate succession. Hence A no sooner falls upon the sense than B is anticipated, and steps are taken to meet it. The whole education of our domestic beasts, all the cunning added by age and experience to wild ones, and the greater part of our human knowingness consists in the ability to make a mass of inferences of this simplest sort. Our 'perceptions,' or recognitions of what objects are before us, are inferences of this kind. We feel a patch of color, and we say 'a distant house,' a whiff of

odor crosses us, and we say 'a skunk,' a faint sound is heard, and we call it 'a railroad train.' Examples are needless; for such inferences of sensations not presented form the staple and tissue of our perceptive life, and our [Chapter XIX](#) was full of them, illusory or veracious. They have been called *unconscious inferences*. Certainly we are commonly unconscious that we are inferring at all. The sign and the signified melt into what seems to us the object of a single pulse of thought. *Immediate inferences* would be a good name for these simple acts of reasoning requiring but two terms,^[320] were it not that formal logic has already appropriated the expression for a more technical use.

'RECEPTS.'

In these first and simplest inferences the conclusion may follow so continuously upon the 'sign' that the latter is not discriminated or attended to as a separate object by the mind. Even now we can seldom define the optical signs which lead us to infer the shapes and distances of the objects which by their aid we so unhesitatingly perceive. The objects, too, when thus inferred, are *general* objects. The dog crossing a scent thinks of a deer in general, or of another dog in general, not of a particular deer or dog. To these most primitive abstract objects Dr. G. J. Romanes gives the name of *recepts* or *generic* ideas, to distinguish them from concepts and general ideas properly so called.^[321] They are not analyzed or defined, but only imagined.

"It requires but a slight analysis of our ordinary mental processes to prove that all our simpler ideas are group-arrangements which have been formed spontaneously or without any of that intentionally comparing, sifting, and combining process which is required in the higher departments of ideational activity. The comparing, sifting, and combining is here done, as it were, *for* the conscious agent, not *by* him. Recepts are received; it is only concepts that require to be conceived.... If I am crossing a street and hear behind me a sudden shout, I do not require to wait in order to predicate to myself that there is probably a hansom-cab just about to run me down: a cry of this kind, and in those circumstances, is so intimately associated in my mind with its purpose, that the idea which it arouses need not rise above the level of a receipt;

and the adaptive movements on my part which that idea immediately prompts are performed without any intelligent reflection. Yet, on the other hand, they are neither reflex actions nor instinctive actions; they are what may be termed *receptual actions*, or actions depending on receipts."^[322]

"How far can this kind of unnamed or non-conceptual ideation extend?" Dr. Romanes asks; and answers by a variety of examples taken from the life of brutes, for which I must refer to his book. One or two of them, however, I will quote:

"Houzeau writes that while crossing a wide and arid plain in Texas, his two dogs suffered greatly from thirst, and that between thirty and forty times they rushed down the hollows to search for water. The hollows were not valleys, and there were no trees in them, or any other difference in the vegetation; and as they were absolutely dry, there could have been no smell of damp earth. The dogs behaved as if they knew that a dip in the ground offered them the best chance of finding water, and Houzeau has often witnessed the same behavior in other animals....

"Mr. Darwin writes: 'When I say to my terrier in an eager voice (and I have made the trial many times), "Hi! hi! where is it?" she at once takes it as a sign that something is to be hunted, and generally first looks quickly all round, and then rushes into the nearest thicket, to scout for any game, but finding nothing she looks up into any neighboring tree for a squirrel. Now do not these actions clearly show that she had in her mind a general idea, or concept, that some animal is to be discovered and hunted?'"^[323]

They certainly show this. But the idea in question is of an object *about* which nothing farther may be articulately known. The thought of it prompts to activity, but to no theoretic consequence. Similarly in the following example:

"Water-fowl adopt a somewhat different mode of alighting upon land, or even upon ice, from that which they adopt when alighting upon water; and those kinds which dive from a height (such as terns and

gannets) never do so upon land or upon ice. These facts prove that the animals have one receipt answering to a solid surface, and another answering to a fluid. Similarly a man will not dive from a height over hard ground or over ice, nor will he jump into water in the same way as he jumps upon dry land. In other words, like the water-fowl he has two distinct receipts, one of which answers to solid ground, and the other to an unresisting fluid. But unlike the water-fowl he is able to bestow upon each of these receipts a name, and thus to raise them both to the level of concepts. So far as the practical purposes of locomotion are concerned, it is of course immaterial whether or not he thus raises his receipts into concepts; but ... for many other purposes it is of the highest importance that he is able to do this."^[324]

IN REASONING, WE PICK OUT ESSENTIAL QUALITIES.

The chief of these purposes is *predication*, a theoretic function which, though it always leads eventually to some kind of action, yet tends as often as not to inhibit the immediate motor response to which the simple inferences of which we have been speaking give rise. In reasoning, A may suggest B; but B, instead of being an idea which is simply *obeyed* by us, is an idea which suggests the distinct additional idea C. And where the train of suggestion is one of reasoning distinctively so called as contrasted with mere revery or 'associative' sequence, the ideas bear certain inward relations to each other which we must proceed to examine with some care.

The result C yielded by a true act of reasoning is apt to be a thing voluntarily *sought*, such as the means to a proposed end, the ground for an observed effect, or the effect of an assumed cause. All these results may be thought of as concrete things, but they are *not suggested immediately by other concrete things*, as in the trains of simply associative thought. They are linked to the concretes which precede them by intermediate steps, and these steps are formed by *general characters* articulately denoted and expressly analyzed out. A thing inferred by reasoning need neither have been an habitual associate of the datum from which we infer it, nor need it be similar to it. It may be a thing entirely unknown to our previous experience, something which no simple association of concretes could ever have evoked. The great difference, in fact, between that simpler kind of

rational thinking which consists in the concrete objects of past experience merely suggesting each other, and reasoning distinctively so called, is this, that whilst the empirical thinking is only reproductive, reasoning is productive. An empirical, or 'rule-of-thumb,' thinker can deduce nothing from data with whose behavior and associates in the concrete he is unfamiliar. But put a reasoner amongst a set of concrete objects which he has neither seen nor heard of before, and with a little time, if he is a good reasoner, he will make such inferences from them as will quite atone for his ignorance. Reasoning helps us out of unprecedented situations—situations for which all our common associative wisdom, all the 'education' which we share in common with the beasts, leaves us without resource.

Let us make this ability to deal with NOVEL data the technical differentia of reasoning. This will sufficiently mark it out from common associative thinking, and will immediately enable us to say just what peculiarity it contains.

It contains analysis and abstraction. Whereas the merely empirical thinker stares at a fact in its entirety, and remains helpless, or gets 'stuck,' if it suggests no concomitant or similar, the reasoner breaks it up and notices some one of its separate attributes. This attribute he takes to be the essential part of the whole fact before him. This attribute has properties or consequences which the fact until then was not known to have, but which, now that it is noticed to contain the attribute, it must have.

Call the fact or concrete datum S;
the essential attribute M;
the attribute's property P.

Then the reasoned inference of P from S cannot be made without M's intermediation. The 'essence' M is thus that third or middle term in the reasoning which a moment ago was pronounced essential. *For his original concrete S the reasoner substitutes its abstract property, M.* What is true of M, what is coupled with M, then holds true of S, is coupled with S. As M is properly one of the *parts* of the entire S, *reasoning may then be very well*

defined as the substitution of parts and their implications or consequences for wholes. And the art of the reasoner will consist of two stages:

First, *sagacity*,^[325] or the ability to discover what part, M, lies embedded in the whole S which is before him;

Second, *learning*, or the ability to recall promptly M's consequences, concomitants, or implications.^[326]

If we glance at the ordinary syllogism—

M is P;
S is M;
Therefore S is P

—we see that the second or minor premise, the 'subsumption' as it is sometimes called, is the one requiring the sagacity; the first or major the one requiring the fertility, or fulness of learning. Usually the learning is more apt to be ready than the sagacity, the ability to seize fresh aspects in concrete things, being rarer than the ability to learn old rules; so that, in most actual cases of reasoning, the minor premise, or the way of conceiving the subject, is the one that makes the novel step in thought. This is, to be sure, not always the case; for the fact that M carries P with it may also be unfamiliar and now formulated for the first time.

The perception that S is M is a *mode of conceiving S*. The statement that M is P is an *abstract or general proposition*. A word about both is necessary.

WHAT IS MEANT BY A MODE OF CONCEIVING.

When we conceive of S merely as M (of vermilion merely as a mercury-compound, for example), we neglect all the other attributes which it may have, and attend exclusively to this one. We mutilate the fulness of S's reality. Every reality has an infinity of aspects or properties. Even so simple a fact as a line which you trace in the air may be considered in respect to its form, its length, its direction, and its location. When we reach more complex facts, the number of ways in which we may regard them is literally endless. Vermilion is not only a mercury-compound, it is vividly red, heavy, and expensive, it comes from China, and so on, *in infinitum*. All objects are well-springs of properties, which are only little by little developed to our

knowledge, and it is truly said that to know one thing thoroughly would be to know the whole universe. Mediatly or immediatly, that one thing is related to everything else; and to know *all* about it, all its relations need be known. But each relation forms one of its attributes, one angle by which some one may conceive it, and while so conceiving it may ignore the rest of it. A man is such a complex fact. But out of the complexity all that an army commissary picks out as important for his purposes is his property of eating so many pounds a day; the general, of marching so many miles; the chair-maker, of having such a shape; the orator, of responding to such and such feelings; the theatre-manager, of being willing to pay just such a price, and no more, for an evening's amusement. Each of these persons singles out the particular side of the entire man which has a bearing on *his* concerns, and not till this side is distinctly and separately conceived can the proper practical conclusions *for that reasoner* be drawn; and when they are drawn the man's other attributes may be ignored.

All ways of conceiving a concrete fact, if they are true ways at all, are equally true ways. *There is no property ABSOLUTELY essential to any one thing.* The same property which figures as the essence of a thing on one occasion becomes a very inessential feature upon another. Now that I am writing, it is essential that I conceive my paper as a surface for inscription. If I failed to do that, I should have to stop my work. But if I wished to light a fire, and no other materials were by, the essential way of conceiving the paper would be as combustible material; and I need then have no thought of any of its other destinations. It is really *all* that it is: a combustible, a writing surface, a thin thing, a hydrocarbonaceous thing, a thing eight inches one way and ten another, a thing just one furlong east of a certain stone in my neighbor's field, an American thing, etc., etc., *ad infinitum*. Whichever one of these aspects of its being I temporarily class it under, makes me unjust to the other aspects. But as I always am classing it under one aspect or another, I am always unjust, always partial, always exclusive. My excuse is necessity—the necessity which my finite and practical nature lays upon me. My thinking is first and last and always for the sake of my doing, and I can only do one thing at a time. A God, who is supposed to drive the whole universe abreast, may also be supposed, without detriment to his activity, to see all parts of it at once and without emphasis. But were our human attention so to disperse itself we should simply stare vacantly at things at large and forfeit our opportunity of doing any particular act. Mr.

Warner, in his Adirondack story, shot a bear by aiming, not at his eye or heart, but 'at him generally.' But we cannot aim 'generally' at the universe; or if we do, we miss our game. Our scope is narrow, and we must attack things piecemeal, ignoring the solid fulness in which the elements of Nature exist, and stringing one after another of them together in a serial way, to suit our little interests as they change from hour to hour. In this, the partiality of one moment is partly atoned for by the different sort of partiality of the next. To me now, writing these words, emphasis and selection seem to be the essence of the human mind. In other chapters other qualities have seemed, and will again seem, more important parts of psychology.

Men are so ingrainedly partial that, for common-sense and scholasticism (which is only common-sense grown articulate), the notion that there is no one quality genuinely, absolutely, and exclusively essential to anything is almost unthinkable. "A thing's essence makes it *what* it is. Without an exclusive essence it would be nothing in particular, would be quite nameless, we could not say it was this rather than that. What you write on, for example,—why talk of its being combustible, rectangular, and the like, when you know that these are mere accidents, and that what it really is, and was made to be, is just *paper* and nothing else?" The reader is pretty sure to make some such comment as this. But he is himself merely insisting on an aspect of the thing which suits his own petty purpose, that of *naming* the thing; or else on an aspect which suits the manufacturer's purpose, that of *producing an article for which there is a vulgar demand*. Meanwhile the reality overflows these purposes at every pore. Our usual purpose with it, our commonest title for it, and the properties which this title suggests, have in reality nothing sacramental. They characterize *us* more than they characterize the thing. But we are so stuck in our prejudices, so petrified intellectually, that to our vulgarest names, with their suggestions, we ascribe an eternal and exclusive worth. The thing must be, essentially, what the vulgarest name connotes; what less usual names connote, it can be only in an 'accidental' and relatively unreal sense.^[327]

Locke undermined the fallacy. But none of his successors, so far as I know, have radically escaped it, or seen that *the only meaning of essence is teleological, and that classification and conception are purely teleological weapons of the mind*. The essence of a thing is that one of its properties which is so *important for my interests* that in comparison with it I may

neglect the rest. Amongst those other things which have this important property I class it, after this property I name it, as a thing endowed with this property I conceive it; and whilst so classing, naming, and conceiving it, all other truths about it become to me as naught.^[328] The properties which are important vary from man to man and from hour to hour.^[329] Hence divers appellations and conceptions for the same thing. But many objects of daily use—as paper, ink, butter, horse-car—have properties of such constant unwavering importance, and have such stereotyped names, that we end by believing that to conceive them in those ways is to conceive them in the only true way. Those are no truer ways of conceiving them than any others; they are only more important ways, more frequently serviceable ways.^[330]

So much for what is implied, when the reasoner conceives of the fact S before him as a case of which the essence is to be M. One word now as to what is involved in M's having properties, consequences, or implications, and we can go back to the study of the reasoning process again.

WHAT IS INVOLVED IN GENERAL PROPOSITIONS.

M is not a concrete, or 'self-sufficient,' as Mr. Clay would say. It is an abstract character which may exist, embedded with other characters, in many concretes. Whether it be the character of being a writing surface, of being made in America or China, of being eight inches square, or of being in a certain part of space, this is always true of it. Now we might conceive of this being a world in which all such general characters were independent of each other, so that if any one of them were found in a subject S, we never could be sure what others would be found alongside of it. On one occasion there might be P with M, on another Q, and so on. In such a world there would be no *general* sequences or coexistences, and no universal laws. Each grouping would be *sui generis*; from the experience of the past no future could be predicted; and reasoning, as we shall presently see, would be an impossibility.

But the world we live in is not one of this sort. Though many general characters seem indifferent to each other, there remain a number of them which affect constant habits of mutual concomitance or repugnance. They involve or imply each other. One of them is a sign to us that the other will be found. They hunt in couples, as it were; and such a proposition as that M

is P, or includes P, or precedes or accompanies P, if it prove to be true in one instance, may very likely be true in every other instance which we meet. This is, in fact, a world in which general laws obtain, in which universal propositions *are* true, and in which reasoning is therefore possible. Fortunately for us: for since we cannot handle things as wholes, but only by conceiving them through some general character which for the time we call their essence, it would be a great pity if the matter ended there, and if the general character, once picked out and in our possession, helped us to no farther advance. In [Chapter XXVIII](#) we shall have again to consider this harmony between our reasoning faculty and the world in which its lot is cast.^[331]

To revert now to our symbolic representation of the reasoning process:

$$\begin{array}{l} M \text{ is } P \\ S \text{ is } M \\ \hline S \text{ is } P \end{array}$$

M is discerned and picked out for the time being to be the essence of the concrete fact, phenomenon, or reality, S. But M in this world of ours is inevitably conjoined with P; so that P is the next thing that we may expect to find conjoined with the fact S. We may conclude or infer P, through the intermediation of the M which our sagacity began by discerning, when S came before it, to be the essence of the case.

Now note that if P have any value or importance for us, M was a very good character for our sagacity to pounce upon and abstract. If, on the contrary, P were of no importance, some other character than M would have been a better essence for us to conceive of S by. Psychologically, as a rule, P overshadows the process from the start. We are *seeking* P, or something like P. But the bare totality of S does not yield it to our gaze; and casting about for some point in S to take hold of, which will lead us to P, we hit, if we are sagacious, upon M, because M happens to be just the character which is knit up with P. Had we wished Q instead of P, and were N a property of S conjoined with Q, we ought to have ignored M, noticed N, and conceived of S as a sort of N exclusively.

Reasoning is always for a subjective interest, to attain some particular conclusion, or to gratify some special curiosity. It not only breaks up the

datum placed before it and conceives it abstractly; it must conceive it *rightly* too; and conceiving it rightly means conceiving it by that one particular abstract character which leads to the one sort of conclusion which it is the reasoner's temporary interest to attain.^[332]

The *results* of reasoning may be hit upon by accident, The stereoscope was actually a result of reasoning; it is conceivable, however, that a man playing with pictures and mirrors might accidentally have hit upon it. Cats have been known to open doors by pulling latches, etc. But no cat, if the latch got out of order, could open the door again, unless some new accident of random fumbling taught her to associate some new total movement with the total phenomenon of the closed door. A reasoning man, however, would open the door by first analyzing the hindrance. He would ascertain what particular feature of the door was wrong. The lever, e.g., does not raise the latch sufficiently from its slot—case of insufficient elevation—raise door bodily on hinges! Or door sticks at top by friction against lintel—press it bodily down! Now it is obvious that a child or an idiot might without this reasoning learn the *rule* for opening that particular door. I remember a clock which the maid-servant had discovered would not go unless it were supported so as to tilt slightly forwards. She had stumbled on this method after many weeks of groping. The reason of the stoppage was the friction of the pendulum-bob against the back of the clock-case, a reason which an educated man would have analyzed out in five minutes. I have a student's lamp of which the flame vibrates most unpleasantly unless the collar which bears the chimney be raised about a sixteenth of an inch. I learned the remedy after much torment by accident, and now always keep the collar up with a small wedge. But my procedure is a mere association of two totals, diseased object and remedy. One learned in pneumatics could have named the *cause* of the disease, and thence inferred the remedy immediately. By many measurements of triangles one might find their area always equal to their height multiplied by half their base, and one might formulate an empirical law to that effect. But a reasoner saves himself all this trouble by seeing that it is the essence (*pro hac vice*) of a triangle to be the half of a parallelogram whose area is the height into the entire base. To see this he must invent additional lines; and the geometer must often draw such to get at the essential property he may require in a figure. The essence consists in some *relation of the figure to the new lines*, a relation not obvious at all

until they are put in. The geometer's sagacity lies in the invention of the new lines.

THUS, THERE ARE TWO GREAT POINTS IN REASONING:

First, an extracted character is taken as equivalent to the entire datum from which it comes; and,

Second, the character thus taken suggests a certain consequence more obviously than it was suggested by the total datum as it originally came. Take them again, successively.

1. Suppose I say, when offered a piece of cloth, "I won't buy that; it looks as if it would fade," meaning merely that something about it suggests the idea of fading to my mind,—my judgment, though possibly correct, is not reasoned, but purely empirical; but, if I can say that into the color there enters a certain dye which I know to be chemically unstable, and that *therefore* the color will fade, my judgment is reasoned. The notion of the dye which is one of the parts of the cloth, is the connecting link between the latter and the notion of fading. So, again, an uneducated man will expect from past experience to see a piece of ice melt if placed near the fire, and the tip of his finger look coarse if he views it through a convex glass. In neither of these cases could the result be anticipated without full previous acquaintance with the entire phenomenon. It is not a result of reasoning.

But a man who should conceive heat as a mode of motion, and liquefaction as identical with increased motion of molecules; who should know that curved surfaces bend light-rays in special ways, and that the apparent size of anything is connected with the amount of the 'bend' of its light-rays as they enter the eye,—such a man would make the right inferences for all these objects, even though he had never in his life had any concrete experience of them; and he would do this because the ideas which we have above supposed him to possess would mediate in his mind between the phenomena he starts with and the conclusions he draws. But these ideas or reasons for his conclusions are all mere extracted portions or circumstances

singled out from the mass of characters which make up the entire phenomena. The motions which form heat, the bending of the light-waves, are, it is true, excessively recondite ingredients; the hidden pendulum I spoke of above is less so; and the sticking of a door on its sill in the earlier example would hardly be so at all. But each and all agree in this, that they bear a *more evident relation* to the conclusion than did the immediate data in their full totality.

The difficulty is, in each case, to extract from the immediate data that particular ingredient which shall have this very evident relation to the conclusion. Every phenomenon or so-called 'fact' has an infinity of aspects or properties, as we have seen, amongst which the fool, or man with little sagacity, will inevitably go astray. But no matter for this point now. The first thing is to have seen that every possible case of reasoning involves the extraction of a particular partial aspect of the phenomena thought about, and that whilst Empirical Thought simply associates phenomena in their entirety, Reasoned Thought couples them by the conscious use of this extract.

2. And, now, to prove the second point: Why are the couplings, consequences, and implications of extracts more evident and obvious than those of entire phenomena? For two reasons.

First, the extracted characters are more general than the concretes, and the connections they may have are, therefore, more familiar to us, having been more often met in our experience. Think of heat as motion, and whatever is true of motion will be true of heat; but we have had a hundred experiences of motion for every one of heat. Think of the rays passing through this lens as bending towards the perpendicular, and you substitute for the comparatively unfamiliar lens the very familiar notion of a particular change in direction of a line, of which notion every day brings us countless examples.

The other reason why the relations of the extracted characters are so evident is that their properties are so *few*, compared with the properties of the whole, from which we derived them. In every concrete total the characters

and their consequences are so inexhaustibly numerous that we may lose our way among them before noticing the particular consequence it behooves us to draw. But, if we are lucky enough to single out the proper character, we take in, as it were, by a single glance all its possible consequences. Thus the character of scraping the sill has very few suggestions, prominent among which is the suggestion that the scraping will cease if we raise the door; whilst the entire refractory door suggests an enormous number of notions to the mind.

Take another example. I am sitting in a railroad-car, waiting for the train to start. It is winter, and the stove fills the car with pungent smoke. The brakeman enters, and my neighbor asks him to "stop that stove smoking." He replies that it will stop entirely as soon as the car begins to move. "Why so?" asks the passenger. "It *always* does," replies the brakeman. It is evident from this 'always' that the connection between car moving and smoke stopping was a purely empirical one in the brakeman's mind, bred of habit. But, if the passenger had been an acute reasoner, he, with no experience of what that stove always did, might have anticipated the brakeman's reply, and spared his own question. Had he singled out of all the numerous points involved in a stove's not smoking the one special point of smoke pouring freely out of the stove-pipe's mouth, he would, probably, owing to the few associations of that idea, have been immediately reminded of the law that a fluid passes more rapidly out of a pipe's mouth if another fluid be at the same time streaming over that mouth; and then the rapid draught of air over the stove-pipe's mouth, which is one of the points involved in the car's motion, would immediately have occurred to him.

Thus a couple of extracted characters, with a couple of their few and obvious connections, would have formed the reasoned link in the passenger's mind between the phenomena, smoke stopping and car moving, which were only linked as wholes in the brakeman's mind. Such examples may seem trivial, but they contain the essence of the most refined and transcendental theorizing. The reason why physics grows more deductive the more the fundamental properties it assumes are of a mathematical sort, such as molecular mass or wave-length, is that the immediate consequences of these notions are so few that we can survey them all at once, and promptly pick out those which concern us.

Sagacity; or the Perception of the Essence.

To reason, then, we must be able to extract characters,—not *any* characters, but the right characters for our conclusion. If we extract the wrong character, it will not lead to that conclusion. Here, then, is the difficulty: *How are characters extracted, and why does it require the advent of a genius in many cases before the fitting character is brought to light?* Why cannot anybody reason as well as anybody else? Why does it need a Newton to notice the law of the squares, a Darwin to notice the survival of the fittest? To answer these questions we must begin a new research, and see how our insight into facts naturally grows.

All our knowledge at first is vague. When we say that a thing is vague, we mean that it has no subdivisions *ab intra*, nor precise limitations *ab extra*; but still all the forms of thought may apply to it. It may have unity, reality, externality, extent, and what not—*thinghood*, in a word, but thinghood only as a whole.^[333] In this vague way, probably, does the room appear to the babe who first begins to be conscious of it as something other than his moving nurse. It has no subdivisions in his mind, unless, perhaps, the window is able to attract his separate notice. In this vague way, certainly, does every entirely new experience appear to the adult. A library, a museum, a machine-shop, are mere confused wholes to the uninstructed, but the machinist, the antiquary, and the bookworm perhaps hardly notice the whole at all, so eager are they to pounce upon the details. Familiarity has in them bred discrimination. Such vague terms as 'grass,' 'mould,' and 'meat' do not exist for the botanist or the anatomist. They know too much about grasses, moulds, and muscles. A certain person said to Charles Kingsley, who was showing him the dissection of a caterpillar, with its exquisite viscera, "Why, I thought it was nothing but skin and squash!" A layman present at a shipwreck, a battle, or a fire is helpless. Discrimination has been so little awakened in him by experience that his consciousness leaves no single point of the complex situation accented and standing out for him to begin to act upon. But the sailor, the fireman, and the general know directly at what corner to take up the business. They 'see into the situation'—that is, they analyze it—with their first glance. It is full of delicately differenced ingredients which their education has little by little brought to their consciousness, but of which the novice gains no clear idea.

How this power of analysis was brought about we saw in our chapters on Discrimination and Attention. We dissociate the elements of originally vague totals by attending to them or noticing them alternately, of course. But what determines which element we shall attend to first? There are two immediate and obvious answers: first, our practical or instinctive interests; and, second, our æsthetic interests. The dog singles out of any situation its smells, and the horse its sounds, because they may reveal facts of practical moment, and are instinctively exciting to these several creatures. The infant notices the candle-flame or the window, and ignores the rest of the room, because those objects give him a vivid pleasure. So, the country boy dissociates the blackberry, the chestnut, and the wintergreen, from the vague mass of other shrubs and trees, for their practical uses, and the savage is delighted with the beads, the bits of looking-glass, brought by an exploring vessel, and gives no heed to the features of the vessel itself, which is too much beyond his sphere. These æsthetic and practical interests, then, are the weightiest factors in making particular ingredients stand out in high relief. What they lay their accent on, that we notice; but what they are in themselves, we cannot say. We must content ourselves here with simply accepting them as irreducible ultimate factors in determining the way our knowledge grows.

Now, a creature which has few instinctive impulses, or interests, practical or æsthetic, will dissociate few characters, and will, at best, have limited reasoning powers; whilst one whose interests are very varied will reason much better. Man, by his immensely varied instincts, practical wants, and æsthetic feelings, to which every sense contributes, would, by dint of these alone, be sure to dissociate vastly more characters than any other animal; and accordingly we find that the lowest savages reason incomparably better than the highest brutes. The diverse interests lead, too, to a diversification of experiences, whose accumulation becomes a condition for the play of that *law of dissociation by varying concomitants* of which I treated in a former chapter (see Vol I. p. 506).

The Help given by Association by Similarity.

It is probable, also, that man's *superior association by similarity* has much to do with those discriminations of character on which his higher flights of

reasoning are based. As this latter is an important matter, and as little or nothing was said of it in the chapter on Discrimination, it behooves me to dwell a little upon it here.

What does the reader do when he wishes to see in what the precise likeness or difference of two objects lies? He transfers his attention as rapidly as possible, backwards and forwards, from one to the other. The rapid alteration in consciousness shakes out, as it were, the points of difference or agreement, which would have slumbered forever unnoticed if the consciousness of the objects compared had occurred at widely distant periods of time. What does the scientific man do who searches for the reason or law embedded in a phenomenon? He deliberately accumulates all the instances he can find which have any analogy to that phenomenon; and, by simultaneously filling his mind with them all, he frequently succeeds in detaching from the collection the peculiarity which he was unable to formulate in one alone; even though that one had been preceded in his former experience by all of those with which he now at once confronts it. These examples show that the mere general fact of having occurred at some time in one's experience, with varying concomitants, is not by itself a sufficient reason for a character to be dissociated now. We need something more; we need that the varying concomitants should in all their variety be brought into consciousness *at once*. Not till then will the character in question escape from its adhesion to each and all of them and stand alone. This will immediately be recognized by those who have read Mill's Logic as the ground of Utility in his famous 'four methods of experimental inquiry,' the methods of agreement, of difference, of residues, and of concomitant variations. Each of these gives a list of analogous instances out of the midst of which a sought-for character may roll and strike the mind.

Now it is obvious that any mind in which association by similarity is highly developed is a mind which will spontaneously form lists of instances like this. Take a present case A, with a character *m* in it. The mind may fail at first to notice this character *m* at all. But if A calls up C, D, E, and F,—these being phenomena which resemble A in possessing *m*, but which may not have entered for months into the experience of the animal who now experiences A, why, plainly, such association performs the part of the reader's deliberately rapid comparison referred to above, and of the systematic consideration of like cases by the scientific investigator, and may

lead to the noticing of m in an abstract way. Certainly this is obvious; and no conclusion is left to us but to assert that, after the few most powerful practical and æsthetic interests, our chief help towards noticing those special characters of phenomena, which, when once possessed and named, are used as reasons, class names, essences, or middle terms, *is this association by similarity*. Without it, indeed, the deliberate procedure of the scientific man would be impossible: he could never collect his analogous instances. But it operates of itself in highly-gifted minds without any deliberation, spontaneously collecting analogous instances, uniting in a moment what in nature the whole breadth of space and time keeps separate, and so permitting a perception of identical points in the midst of different circumstances, which minds governed wholly by the law of contiguity could never begin to attain.

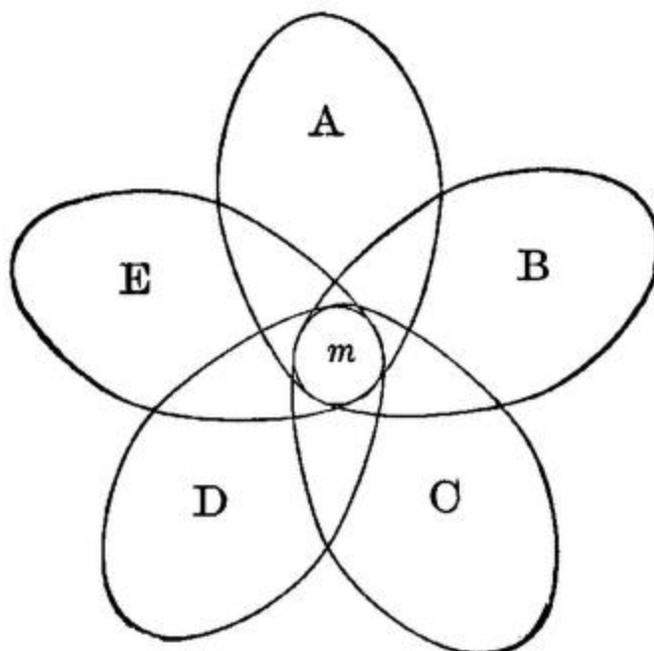


FIG. 80.

Figure 80 shows this. If m , in the present representation A, calls up B, C, D, and E, which are similar to A in possessing it, and calls them up in rapid succession, then m , being associated almost simultaneously with such varying concomitants, will 'roll out' and attract our separate notice.

If so much is clear to the reader, he will be willing to admit that the mind *in which this mode of association most prevails* will, from its better opportunity of extricating characters, be the one most prone to reasoned thinking; whilst, on the other hand, a mind in which we do not detect reasoned thinking will probably be one in which association by contiguity holds almost exclusive sway.

Geniuses are, by common consent, considered to differ from ordinary minds by an unusual development of association by similarity. One of Professor Bain's best strokes of work is the exhibition of this truth.^[334] It applies to geniuses in the line of reasoning as well as in other lines. And as the genius is to the vulgarian, so the vulgar human mind is to the intelligence of a brute. Compared with men, it is probable that brutes neither attend to abstract characters, nor have associations by similarity. Their thoughts probably pass from one concrete object to its habitual concrete successor far more uniformly than is the case with us. In other words, their associations

of ideas are almost exclusively by contiguity. It will clear up still farther our understanding of the reasoning process, if we devote a few pages to

THE INTELLECTUAL CONTRAST BETWEEN BRUTE AND MAN.

I will first try to show, by taking the best stories I can find of animal sagacity, that the mental process involved may as a rule be perfectly accounted for by mere contiguous association, based on experience. Mr. Darwin, in his 'Descent of Man,' instances the Arctic dogs, described by Dr. Hayes, who scatter, when drawing a sledge, as soon as the ice begins to crack. This might be called by some an exercise of reason. The test would be, Would the most intelligent Eskimo dogs that ever lived act so when placed upon ice for the first time together? A band of men from the tropics might do so easily. Recognizing cracking to be a sign of breaking, and seizing immediately the partial character that the point of rupture is the point of greatest strain, and that the massing of weight at a given point concentrates there the strain, a Hindoo might quickly infer that scattering would stop the cracking, and, by crying out to his comrades to disperse, save the party from immersion. But in the dog's case we need only suppose that they have individually experienced wet skins after cracking, that they have often noticed cracking to begin when they were huddled together, and that they have observed it to cease when they scattered. Naturally, therefore, the sound would redintegrate all these former experiences, including that of scattering, which latter they would promptly renew. It would be a case of immediate suggestion or of that 'Logic of Recepts' as Mr. Romanes calls it, of which we spoke above on [p. 327](#).

A friend of the writer gave as a proof of the almost human intelligence of his dog that he took him one day down to his boat on the shore, but found the boat full of dirt and water. He remembered that the sponge was up at the house, a third of a mile distant; but, disliking to go back himself, he made various gestures of wiping out the boat and so forth, saying to his terrier, "Sponge, sponge; go fetch the sponge." But he had little expectation of a result, since the dog had never received the slightest training with the boat or the sponge. Nevertheless, off he trotted to the house, and, to his owner's great surprise and admiration, brought the sponge in his jaws. Sagacious as this was, it required nothing but ordinary contiguous association of ideas.

The terrier was only exceptional in the minuteness of his spontaneous observation. Most terriers would have taken no interest in the boat-cleaning operation, nor noticed what the sponge was for. This terrier, in having picked those details out of the crude mass of his boat-experience distinctly enough to be reminded of them, was truly enough ahead of his peers on the line which leads to human reason. But his act was not yet an act of reasoning proper. It might fairly have been called so if, unable to find the sponge at the house, he had brought back a dipper or a mop instead. Such a substitution would have shown that, embedded in the very different appearances of these articles, he had been able to discriminate the identical partial attribute of capacity to take up water, and had reflected, "For the present purpose they are identical." This, which the dog did not do, any man but the very stupidest could not fail to do.

If the reader will take the trouble to analyze the best dog and elephant stories he knows, he will find that, in most cases, this simple contiguous calling up of one whole by another is quite sufficient to explain the phenomena. Sometimes, it is true, we have to suppose the recognition of a property or character as such, but it is then always a character which the peculiar practical interests of the animal may have singled out. A dog, noticing his master's hat on its peg, may possibly infer that he has not gone out. Intelligent dogs recognize by the tone of the master's voice whether the latter is angry or not. A dog will perceive whether you have kicked him by accident or by design, and behave accordingly. The character inferred by him, the particular mental state in you, however it be represented in his mind—it is represented probably by a 'recept' ([p. 327](#)) or set of practical tendencies, rather than by a definite concept or idea—is still a partial character extracted from the totality of your phenomenal being, and is his reason for crouching and skulking, or playing with you. Dogs, moreover, seem to have the feeling of the value of their master's personal property, or at least a particular *interest* in objects which their master uses. A dog left with his master's coat will defend it, though never taught to do so. I know of a dog accustomed to swim after sticks in the water, but who always refused to dive for stones. Nevertheless, when a fish-basket, which he had never been trained to carry, but merely knew as his master's, fell over, he immediately dived after it and brought it up. Dogs thus discern, at any rate so far as to be able to act, this partial character of *being valuable*, which lies hidden in certain things.^[335] Stories are told of dogs carrying coppers to

pastry-cooks to get buns, and it is said that a certain dog, if he gave two coppers, would never leave without two buns. This was probably mere contiguous association, but it is *possible* that the animal noticed the character of duality, and identified it as the same in the coin and the cake. If so, it is the maximum of canine abstract thinking. Another story told to the writer is this: a dog was sent to a lumber-camp to fetch a wedge, with which he was known to be acquainted. After half an hour, not returning, he was sought and found biting and tugging at the handle of an axe which was driven deeply into a stump. The wedge could not be found. The teller of the story thought that the dog must have had a clear perception of the common character of serving to split which was involved in both the instruments, and, from their identity in this respect, inferred their identity for the purposes required.

It cannot be denied that this interpretation is a possible one, but it seems to me far to transcend the limits of ordinary canine abstraction. The property in question was not one which had direct personal interest for the dog, such as that of belonging to his master is in the case of the coat or the basket. If the dog in the sponge story had returned to the boat with a dipper it would have been no more remarkable. It seems more probable, therefore, that this wood-cutter's dog had also been accustomed to carry the axe, and now, excited by the vain hunt for the wedge, had discharged his carrying powers upon the former instrument in a sort of confusion—just as a man may pick up a sieve to carry water in, in the excitement of putting out a fire.^[336]

Thus, then, the characters extracted by animals are very few, and always related to their immediate interests or emotions. That dissociation by varying concomitants, which in man is based so largely on association by similarity, hardly seems to take place at all in the mind of brutes. One total thought suggests to them another total thought, and they find themselves acting with propriety, they know not why. The great, the fundamental, defect of their minds seems to be the inability of their groups of ideas to break across in unaccustomed places. They are enslaved to routine, to cut-and-dried thinking; and if the most prosaic of human beings could be transported into his dog's mind, he would be appalled at the utter absence of fancy which reigns there.^[337] Thoughts will not be found to call up their similars, but only their habitual successors. Sunsets will not suggest heroes' deaths, but supper-time. This is why man is the only metaphysical animal.

To wonder why the universe should be as it is presupposes the notion of its being different, and a brute, which never reduces the actual to fluidity by breaking up its literal sequences in his imagination, can never form such a notion. He takes the world simply for granted, and never wonders at it at all.

Professor Strümpell quotes a dog-story which is probably a type of many others. The feat performed looks like abstract reasoning; but an acquaintance with all the circumstances shows it to have been a random trick learned by habit. The story is as follows:

"I have two dogs, a small, long-legged pet dog and a rather large watch-dog. Immediately beyond the house-court is the garden, into which one enters through a low lattice-gate which is closed by a latch on the yard-side. This latch is opened by lifting it. Besides this, moreover, the gate is fastened on the garden-side by a string nailed to the gate-post. Here, as often as one wished, could the following sight be observed. If the little dog was shut in the garden and he wished to get out, he placed himself before the gate and barked. Immediately the large dog in the court would hasten to him and raise the latch with his nose while the little dog on the garden-side leaped up and, catching the string in his teeth, bit it through; whereupon the big one wedged his snout between the gate and the post, pushed the gate open, and the little dog slipped through. Certainly reasoning seems here to prevail. In face of it, however, and although the dogs arrived of themselves, and without human aid, at their solution of the gate question, I am able to point out that the complete action was pieced together out of accidental experiences which the dogs followed, I might say, unconsciously. While the large dog was young, he was allowed, like the little one, to go into the garden, and therefore the gate was usually not latched, but simply closed. Now if he saw anyone go in, he would follow by thrusting his snout between gate and post, and so pushing the gate open. When he was grown I forbade his being taken in, and had the gate kept latched. But he naturally still tried to follow when anyone entered and tried in the old fashion to open it, which he could no longer do. Now it fell out that once, while making the attempt, he raised his nose higher than usual and hit the latch from below so as to lift it off its hook, and the gate unclosed. From thenceforth he made the same movement of the head when trying to open it, and, of course,

with the same result. He now knew how to open the gate when it was latched.

"The little dog had been the large one's teacher in many things, especially in the chasing of cats and the catching of mice and moles; so when the little one was heard barking eagerly, the other always hastened to him. If the barking came from the garden, he opened the gate to get inside. But meanwhile the little dog, who wanted to get out the moment the gate opened, slipped out between the big one's legs, and so the appearance of his having come with the intention of letting him out arose. And that it was simply an appearance transpired from the fact that when the little dog did not succeed at once in getting out, the large one ran in and nosed about the garden, plainly showing that he had expected to find something there. In order to stop this opening of the gate I fastened a string on the garden-side which, tightly drawn, held the gate firm against the post, so that if the yard dog raised the latch and let go, it would every time fall back on to the hook. And this device was successful for quite a time, until it happened one day that on my return from a walk upon which the little dog had accompanied me I crossed the garden, and in passing through the gate the dog remained behind, and refused to come to my whistle. As it was beginning to rain, and I knew how he disliked to get wet, I closed the gate in order to punish him in this manner. But I had hardly readied the house ere he was before the gate, whining and crying most piteously, for the rain was falling faster and faster. The big dog, to whom the rain was a matter of perfect indifference, was instantly on hand and tried his utmost to open the gate, but naturally without success. Almost in despair the little dog bit at the gate, at the same time springing into the air in the attempt to jump over it, when he chanced to catch the string in his teeth; it broke, and the gate flew open. Now he knew the secret and thenceforth bit the string whenever he wished to get out, so that I was obliged to change it.

"That the big dog in raising the latch did not in the least *know* that the latch closed the gate, that the raising of the same opened it, but that he merely repeated the automatic blow with his snout which had once had such happy consequences, transpires from the following: the gate leading to the barn is fastened with a latch precisely like the one on the

garden-gate, only placed a little higher, still easily within the dog's reach. Here, too, occasionally the little dog is confined, and when he barks the big one makes every possible effort to open the gate, but it has never occurred to him to push the latch up. The brute cannot draw conclusions, that is, he cannot think."^[338]

Other classical *differentiæ* of man besides that of being the only reasoning animal, also seem consequences of his unrivalled powers of similar association. He has, e.g., been called 'the laughing animal.' But humor has often been defined as the recognition of identities in things different. When the man in *Coriolanus* says of that hero that "there is no more mercy in him than there is milk in a male tiger," both the invention of the phrase and its enjoyment by the hearer depend on a peculiarly perplexing power to associate ideas by similarity.

Man is known again as 'the talking animal'; and language is assuredly a capital distinction between man and brute. But it may readily be shown how this distinction merely flows from those we have pointed out, easy dissociation of a representation into its ingredients, and association by similarity.

Language is a system of *signs*, different from the things signified, but able to suggest them.

No doubt brutes have a number of such signs. When a dog yelps in front of a door, and his master, understanding his desire, opens it, the dog may, after a certain number of repetitions, get to repeat in cold blood a yelp which was at first the involuntary interjectional expression of strong emotion. The same dog may be taught to 'beg' for food, and afterwards come to do so deliberately when hungry. The dog also learns to understand the signs of men, and the word 'rat' uttered to a terrier suggests exciting thoughts of the rat-hunt. If the dog had the varied impulse to vocal utterance which some other animals have, he would probably repeat the word 'rat' whenever he spontaneously happened to think of a rat-hunt—he no doubt does have it as an auditory image, just as a parrot calls out different words spontaneously from its repertory, and having learned the name of a given dog will utter it on the sight of a different dog. In each of these separate cases the particular sign *may* be consciously noticed by the animal, as distinct from the particular thing signified, and will thus, so far as it goes, be a true

manifestation of language. But when we come to man we find a great difference. *He has a deliberate intention to apply a sign to everything.* The linguistic impulse is with him generalized and systematic. For things hitherto unnoticed or unfelt, he *desires* a sign before he has one. Even though the dog should possess his 'yelp' for this thing, his 'beg' for that, and his auditory image 'rat' for a third thing, the matter with him rests there. If a fourth thing interests him for which no sign happens already to have been learned, he remains tranquilly without it and goes no further. But the man *postulates* it, its absence irritates him, and he ends by inventing it. *This GENERAL PURPOSE constitutes, I take it, the peculiarity of human speech, and explains its prodigious development.*

How, then, does the general purpose arise? It arises as soon as the notion of a *sign as such*, apart from any particular import, is born; and this notion is born by dissociation from the outstanding portions of a number of concrete cases of signification. The 'yelp,' the 'beg,' the 'rat,' differ as to their several imports and natures. They agree only in so far as they have the same *use*—to *be signs*, to stand for something more important than themselves. The dog whom this similarity could strike would have grasped the sign *per se* as such, and would probably thereupon become a general sign-maker, or speaker in the human sense. But how can the similarity strike him? Not without the juxtaposition of the similars (in virtue of the law we have laid down (Vol. I. p. 506), that in order to be segregated an experience must be repeated with varying concomitants)—not unless the 'yelp' of the dog at the moment it occurs *recalls* to him his 'beg,' by the delicate bond of their subtle similarity of use—not till then can this thought flash through his mind: "Why, yelp and beg, in spite of all their unlikeness, are yet alike in this: that they are actions, signs, which lead to important boons. Other boons, *any* boons, may then be got by other signs!" This reflection made, the gulf is passed. Animals probably never make it, because the bond of similarity is not delicate enough. Each sign is drowned in *its* import, and never awakens other signs and other imports in juxtaposition. The rat-hunt idea is too absorbingly interesting in itself to be interrupted by anything so uncontiguous to it as the idea of the 'beg for food,' or of 'the door-open yelp,' nor in their turn do these awaken the rat-hunt idea.

In the human child, however, these ruptures of contiguous association are very soon made; far off cases of sign-using arise when we make a sign now;

and soon language is launched. The child in each case makes the discovery for himself. No one can help him except by furnishing him with the conditions. But as he is constituted, the conditions will sooner or later shoot together into the result.^[339]

The exceedingly interesting account which Dr. Howe gives of the education of his various blind-deaf mutes illustrates this point admirably. He began to teach Laura Bridgman by gumming raised letters on various familiar articles. The child was taught by mere contiguity to pick out a certain number of particular articles when made to feel the letters. But this was merely a collection of particular signs, out of the mass of which the general purpose of *signification* had not yet been extracted by the child's mind. Dr. Howe compares his situation at this moment to that of one lowering a line to the bottom of the deep sea in which Laura's soul lay, and waiting until she should spontaneously take hold of it and be raised into the light. The moment came, 'accompanied by a radiant flash of intelligence and glow of joy'; she seemed suddenly to become aware of the general purpose imbedded in the different details of all these signs, and from that moment her education went on with extreme rapidity.

Another of the great capacities in which man has been said to differ fundamentally from the animal is that of possessing self-consciousness or reflective knowledge of himself as a thinker. But this capacity also flows from our criterion, for (without going into the matter very deeply) we may say that the brute never reflects on himself as a thinker, because he has never clearly dissociated, in the full concrete act of thought, the element of the thing thought of and the operation by which he thinks it. They remain always fused, conglomerated—just as the interjectional vocal sign of the brute almost invariably merges in his mind with the thing signified, and is not independently attended to *in se*.^[340]

Now, the dissociation of these two elements probably occurs first in the child's mind on the occasion of some error or false expectation which would make him experience the shock of difference between merely imagining a thing and getting it. The thought experienced once with the concomitant reality, and then without it or with opposite concomitants, reminds the child of other cases in which the same provoking phenomenon occurred. Thus the general ingredient of error may be dissociated and noticed *per se*, and from the notion of his error or wrong thought to that of his thought in general the

transition is easy. The brute, no doubt, has plenty of instances of error and disappointment in his life, but the similar shock is in him most likely always swallowed up in the accidents of the actual case. An expectation disappointed may breed dubiety as to the realization of that particular thing when the dog next expects it. But that disappointment, that dubiety, while they are present in the mind, will *not* call up other cases, in which the material details were different, but this feature of possible error was the same. The brute will, therefore, stop short of dissociating the general notion of error *per se*, and *a fortiori* will never attain the conception of Thought itself as such.

We may then, we think, consider it proven that *the most elementary single difference between the human mind and that of brutes lies in this deficiency on the brute's part to associate ideas by similarity*—characters, the abstraction of which depends on this sort of association, must in the brute always remain drowned, swamped in the total phenomenon which they help constitute, and never used to reason from. If a character stands out alone, it is always some obvious sensible quality like a sound or a smell which is instinctively exciting and lies in the line of the animal's propensities; or it is some obvious sign which experience has habitually coupled with a consequence, such as, for the dog, the sight of his master's hat on and the master's going out.

DIFFERENT ORDERS OF HUMAN GENIUS.

But, now, since nature never makes a jump, it is evident that we should find the lowest men occupying in this respect an intermediate position between the brutes and the highest men. And so we do. Beyond the analogies which their own minds suggest by breaking up the literal sequence of their experience, there is a whole world of analogies which they can appreciate when imparted to them by their betters, but which they could never excogitate alone. This answers the question why Darwin and Newton had to be waited for so long. The flash of similarity between an apple and the moon, between the rivalry for food in nature and the rivalry for man's

selection, was too recondite to have occurred to any but exceptional minds. *Genius, then, as has been already said, is identical with the possession of similar association to an extreme degree.* Professor Bain says: "This I count the leading fact of genius. I consider it quite impossible to afford any explanation of intellectual originality except on the supposition of unusual energy on this point." Alike in the arts, in literature, in practical affairs, and in science, association by similarity is the prime condition of success.

But as, according to our view, there are two stages in reasoned thought, one where similarity merely *operates* to call up cognate thoughts, and another farther stage, where the bond of identity between the cognate thoughts is *noticed*; so *minds of genius may be divided into two main sorts, those who notice the bond and those who merely obey it.* The first are the abstract reasoners, properly so called, the men of science, and philosophers—the analysts, in a word; the latter are the poets, the critics—the artists, in a word, the men of intuitions. These judge rightly, classify cases, characterize them by the most striking analogic epithets, but go no further. At first sight it might seem that the analytic mind represented simply a higher intellectual stage, and that the intuitive mind represented an arrested stage of intellectual development; but the difference is not so simple as this. Professor Bain has said that a man's advance to the scientific stage (the stage of noticing and abstracting the bond of similarity) may often be due to an *absence* of certain emotional sensibilities. The sense of color, he says, may no less determine a mind away from science than it determines it toward painting. There must be a penury in one's interest in the details of particular forms in order to permit the forces of the intellect to be concentrated on what is common to many forms.^[341] In other words, supposing a mind fertile in the suggestion of analogies, but, at the same time, keenly interested in the particulars of each suggested image, that mind would be far less apt to single out the particular character which called up the analogy than one whose interests were less generally lively. A certain richness of the æsthetic nature may, therefore, easily keep one in the intuitive stage. All the poets are examples of this. Take Homer:

"Ulysses, too, spied round the house to see if any man were still alive and hiding, trying to get away from gloomy death. He found them all fallen in the blood and dirt, and in such number as the fish which the fishermen to the low shore, out of the foaming sea, drag with their

meshy nets. These all, sick for the ocean water, are strewn around the sands, while the blazing sun takes their life from them. So there the suitors lay strewn round on one another." Or again:

"And as when a Mæonian or a Carian woman stains ivory with purple to be a cheek-piece for horses, and it is kept in the chamber, and many horsemen have prayed to bear it off; but it is kept a treasure for a king, both a trapping for his horse and a glory to the driver—in such wise were thy stout thighs, Menelaos, and legs and fair ankles stained with blood."^[342]

A man in whom all the accidents of an analogy rise up as vividly as this, may be excused for not attending to the ground of the analogy. But he need not on that account be deemed intellectually the inferior of a man of drier mind, in whom the ground is not as liable to be eclipsed by the general splendor. Barely are both sorts of intellect, the splendid and the analytic, found in conjunction. Plato among philosophers, and M. Taine, who cannot quote a child's saying without describing the '*voix chantante, étonnée, heureuse*' in which it is uttered, are only exceptions whose strangeness proves the rule.

An often-quoted writer has said that Shakespeare possessed more *intellectual power* than any one else that ever lived. If by this he meant the power to pass from given premises to right or congruous conclusions, it is no doubt true. The abrupt transitions in Shakespeare's thought astonish the reader by their unexpectedness no less than they delight him by their fitness. Why, for instance, does the death of Othello so stir the spectator's blood and leave him with a sense of reconciliation? Shakespeare himself could very likely not say why; for his invention, though rational, was not ratiocinative. Wishing the curtain to fall upon a reinstated Othello, that speech about the turbaned Turk suddenly simply flashed across him as the right end of all that went before. The dry critic who comes after can, however, point out the subtle bonds of identity that guided Shakespeare's pen through that speech to the death of the Moor. Othello is sunk in ignominy, lapsed from his height at the beginning of the play. What better way to rescue him at last from this abasement than to make him for an instant identify himself in memory with the old Othello of better days, and then execute justice on his present disowned body, as he used then to smite

all enemies of the State? But Shakespeare, whose mind supplied these means, could probably not have told why they were so effective.

But though this is true, and though it would be absurd in an absolute way to say that a given analytic mind was superior to any intuitional one, yet it is none the less true that the former *represents* the higher stage. Men, taken historically, reason by analogy long before they have learned to reason by abstract characters. Association by similarity and true reasoning may have identical results. If a philosopher wishes to prove to you why you should do a certain thing, he may do so by using abstract considerations exclusively; a savage will prove the same by reminding you of a similar case in which you notoriously do as he now proposes, and this with no ability to state the *point* in which the cases are similar. In all primitive literature, in all savage oratory, we find persuasion carried on exclusively by parables and similes, and travellers in savage countries readily adopt the native custom. Take, for example, Dr. Livingstone's argument with the negro conjuror. The missionary was trying to dissuade the savage from his fetichistic ways of invoking rain. "You see," said he, "that, after all your operations, sometimes it rains and sometimes it does not, exactly as when you have not operated at all." "But," replied the sorcerer, "it is just the same with you doctors; you give your remedies, and sometimes the patient gets well and sometimes he dies, just as when you do nothing at all." To that the pious missionary replied: "The doctor does his duty, after which God performs the cure if it pleases Him." "Well," rejoined the savage, "it is just so with me. I do what is necessary to procure rain, after which God sends it or withholds it according to His pleasure."^[343]

This is the stage in which proverbial philosophy reigns supreme. "An empty sack can't stand straight" will stand for the reason why a man with debts may lose his honesty; and "a bird in the hand is worth two in the bush" will serve to back up one's exhortations to prudence. Or we answer the question: "Why is snow white?" by saying, "For the same reason that soap-suds or whipped eggs are white"—in other words, instead of giving the *reason* for a fact, we give another *example* of the same fact. This offering a similar instance, instead of a reason, has often been criticised as one of the forms of logical depravity in men. But manifestly it is not a perverse act of thought, but only an incomplete one. Furnishing parallel cases is the necessary first step towards abstracting the reason imbedded in them all.

As it is with reasons, so it is with words. The first words are probably always names of entire things and entire actions, of extensive coherent groups. A new experience in the primitive man can only be talked about by him in terms of the old experiences which have received names. It reminds him of certain ones from among them, but the *points* in which it agrees with them are neither named nor dissociated. Pure similarity must work before the abstraction can work which is based upon it. The first adjectives will therefore probably be total nouns embodying the striking character. The primeval man will say, not 'the bread is hard,' but 'the bread is stone'; not 'the face is round,' but 'the face is moon'; not 'the fruit is sweet,' but 'the fruit is sugar-cane.' The first words are thus neither particular nor general, but *vaguely* concrete; just as we speak of an 'oval' face, a 'velvet' skin, or an 'iron' will, without meaning to connote any other attributes of the adjective-noun than those in which it *does* resemble the noun it is used to qualify. After a while certain of these adjectively-used nouns come only to signify the particular quality for whose sake they are oftenest used; the *entire thing* which they originally meant receives another name, and they become true abstract and general terms. Oval, for example, with us suggests *only* shape. The first abstract qualities thus formed are, no doubt, qualities of one and the same sense found in different objects—as big, sweet; next analogies between different senses, as 'sharp' of taste, 'high' of sound, etc.; then analogies of motor combinations, or form of relation, as simple, confused, difficult, reciprocal, relative, spontaneous, etc. The extreme degree of subtlety in analogy is reached in such cases as when we say certain English art critics' writing reminds us of a close room in which pastilles have been burning, or that the mind of certain Frenchmen is like old Roquefort cheese. Here language utterly fails to hit upon the basis of resemblance.

Over immense departments of our thought we are still, all of us, in the savage state. Similarity operates in us, but abstraction has not taken place. We know what the present case is like, we know what it reminds us of, we have an intuition of the right course to take, if it be a practical matter. But analytic thought has made no tracks, and we cannot justify ourselves to others. In ethical, psychological, and æsthetic matters, to give a clear reason for one's judgment is universally recognized as a mark of rare genius. The helplessness of uneducated people to account for their likes and dislikes is often ludicrous. Ask the first Irish girl why she likes this country better or worse than her home, and see how much she can tell you. But if you ask

your most educated friend why he prefers Titian to Paul Veronese, you will hardly get more of a reply; and you will probably get absolutely none if you inquire why Beethoven reminds him of Michael Angelo, or how it comes that a bare figure with unduly flexed joints, by the latter, can so suggest the moral tragedy of life. His thought obeys a *nexus*, but cannot name it. And so it is with all those judgments of *experts*, which even though unmotivated are so valuable. Saturated with experience of a particular class of materials, an expert intuitively feels whether a newly-reported fact is probable or not, whether a proposed hypothesis is worthless or the reverse. He instinctively knows that, in a novel case, this and not that will be the promising course of action. The well-known story of the old judge advising the new one never to give reasons for his decisions, "the decisions will probably be right, the reasons will surely be wrong," illustrates this. The doctor will feel that the patient is doomed, the dentist will have a premonition that the tooth will break, though neither can articulate a reason for his foreboding. The reason lies imbedded, but not yet laid bare, in all the countless previous cases dimly suggested by the actual one, all calling up the same conclusion, which the adept thus finds himself swept on to, he knows not how or why.

A physiological conclusion remains to be drawn. If the principles laid down in Chapter XIV are true, then it follows that the great cerebral difference between habitual and reasoned thinking must be this: that in the former an entire system of cells vibrating at any one moment discharges in its totality into another entire system, and that the order of the discharges tends to be a constant one in time; whilst in the latter a part of the prior system still keeps vibrating in the midst of the subsequent system, and the order—which part this shall be, and what shall be its concomitants in the subsequent system—has little tendency to fixedness in time. This physical selection, so to call it, of one part to vibrate persistently whilst the others rise and subside, we found, in the chapter in question, to be the basis of similar association. (See especially Vol. I. pp. 578-81.) It would seem to be but a minor degree of that still more urgent and importunate localized vibration which we can easiest conceive to underlie the mental fact of interest, attention, or dissociation. In terms of the brain-process, then, all these mental facts

resolve themselves into a single peculiarity: that of indeterminateness of connection between the different tracts, and tendency of action to focalize itself, so to speak, in small localities which vary infinitely at different times, and from which irradiation may proceed in countless shifting ways. (Compare figure 80, [p. 347.](#)) To discover, or (what more befits the present stage of nerve-physiology) to adumbrate by some possible guess, on what chemical or molecular-mechanical fact this instable equilibrium of the human brain may depend, should be the next task of the physiologist who ponders over the passage from brute to man. Whatever the physical peculiarity in question may be, *it* is the cause why a man, whose brain has it, reasons so much, whilst his horse, whose brain lacks it, reasons so little. We can but bequeath the problem to abler hands than our own.

But, meanwhile, this mode of stating the matter suggests a couple of other inferences. The first is brief. If *focalization* of brain-activity be the fundamental fact of reasonable thought, we see why intense interest or concentrated passion makes us think so much more truly and profoundly. The persistent *focalization* of motion in certain tracts is the cerebral fact corresponding to the persistent domination in consciousness of the important feature of the subject. When not 'focalized,' we are scatter-brained; but when thoroughly impassioned, we never wander from the point. None but congruous and relevant images arise. When roused by indignation or moral enthusiasm, how trenchant are our reflections, how smiting are our words! The whole network of petty scruples and by-considerations which, at ordinary languid times, surrounded the matter like a cobweb, holding back our thought, as Gulliver was pinned to the earth by the myriad Lilliputian threads, are dashed through at a blow, and the subject stands with its essential and vital lines revealed.

The last point is relative to the theory that what was acquired habit in the ancestor may become congenital tendency in the offspring. So vast a superstructure is raised upon this principle that the paucity of empirical evidence for it has alike been matter of regret to its adherents, and of triumph to its opponents. In [Chapter XXVIII](#) we shall see what we may call the whole beggarly array of proof. In the human race, where our

opportunities for observation are the most complete, we seem to have no evidence whatever which would support the hypothesis, unless it possibly be the law that city-bred children are more apt to be near-sighted than country children. In the mental world we certainly do not observe that the children of great travellers get their geography lessons with unusual ease, or that a baby whose ancestors have spoken German for thirty generations will, on that account, learn Italian any the less easily from its Italian nurse. But if the considerations we have been led to are true, they explain perfectly well why this law *should not* be verified in the human race, and why, therefore, in looking for evidence on the subject, we should confine ourselves exclusively to lower animals. In them fixed habit is the essential and characteristic law of nervous action. The brain grows to the exact modes in which it has been exercised, and the inheritance of these modes—then called instincts—would have in it nothing surprising. But in man the negation of all fixed modes is the essential characteristic. He owes his whole pre-eminence as a reasoner, his whole human quality of intellect, we may say, to the facility with which a given mode of thought in him may suddenly be broken up into elements, which recombine anew. Only at the price of inheriting no settled instinctive tendencies is he able to settle every novel case by the fresh discovery by his reason of novel principles. He is, *par excellence*, the *educable* animal. If, then, the law that habits are inherited were found exemplified in him, he would, in so far forth, fall short of his human perfections; and, when we survey the human races, we actually do find that those which are most instinctive at the outset are those which, on the whole, are least educated in the end. An untutored Italian is, to a great extent, a man of the world; he has instinctive perceptions, tendencies to behavior, reactions, in a word, upon his environment, which the untutored German wholly lacks. If the latter be not drilled, he is apt to be a thoroughly loutish personage; but, on the other hand, the mere absence in his brain of definite innate tendencies enables him to advance by the development, through education, of his purely reasoned thinking, into complex regions of consciousness that the Italian may probably never approach.

We observe an identical difference between men as a whole and women as a whole. A young woman of twenty reacts with intuitive promptitude and security in all the usual circumstances in which she may be placed.^[344] Her likes and dislikes are formed; her opinions, to a great extent, the same that

they will be through life. Her character is, in fact, finished in its essentials. How inferior to her is a boy of twenty in all these respects! His character is still gelatinous, uncertain what shape to assume, 'trying it on' in every direction. Feeling his power, yet ignorant of the manner in which he shall express it, he is, when compared with his sister, a being of no definite contour. But this absence of prompt tendency in his brain to set into particular modes is the very condition which insures that it shall ultimately become so much more efficient than the woman's. The very lack of preappointed trains of thought is the ground on which general principles and heads of classification grow up; and the masculine brain deals with new and complex matter indirectly by means of these, in a manner which the feminine method of direct intuition, admirably and rapidly as it performs within its limits, can vainly hope to cope with.

In looking back over the subject of reasoning, one feels how intimately connected it is with conception; and one realizes more than ever the deep reach of that principle of selection on which so much stress was laid towards the close of Chapter IX. As the art of reading (after a certain stage in one's education) is the art of skipping, so the art of being wise is the art of knowing what to overlook. The first effect on the mind of growing cultivated is that processes once multiple get to be performed by a single act. Lazarus has called this the progressive 'condensation' of thought. But in the psychological sense it is less a condensation than a loss, a genuine dropping out and throwing overboard of conscious content. Steps really sink from sight. An advanced thinker sees the relations of his topics in such masses and so instantaneously that when he comes to explain to younger minds it is often hard to say which grows the more perplexed, he or the pupil. In every university there are admirable investigators who are notoriously bad lecturers. The reason is that they never spontaneously see the subject in the minute articulate way in which the student needs to have it offered to his slow reception. They grope for the links, but the links do not come. Bowditch, who translated and annotated Laplace's *Mécanique Céleste*, said that whenever his author prefaced a proposition by the words 'it is evident,' he knew that many hours of hard study lay before him.

When two minds of a high order, interested in kindred subjects, come together, their conversation is chiefly remarkable for the summariness of its allusions and the rapidity of its transitions. Before one of them is half through a sentence the other knows his meaning and replies. Such genial play with such massive materials, such an easy flashing of light over far perspectives, such careless indifference to the dust and apparatus that ordinarily surround the subject and seem to pertain to its essence, make these conversations seem true feasts for gods to a listener who is educated enough to follow them at all. His mental lungs breathe more deeply, in an atmosphere more broad and vast than is their wont. On the other hand, the excessive explicitness and short-windedness of an ordinary man are as wonderful as they are tedious to the man of genius. But we need not go as far as the ways of genius. Ordinary social intercourse will do. There the charm of conversation is in direct proportion to the possibility of abridgment and elision, and in inverse ratio to the need of explicit statement. With old friends a word stands for a whole story or set of opinions. With new-comers everything must be gone over in detail. Some persons have a real mania for completeness, they must express every step. They are the most intolerable of companions, and although their mental energy may in its way be great, they always strike us as weak and second-rate. In short, the essence of plebeianism, that which separates vulgarity from aristocracy, is perhaps less a defect than an excess, the constant need to animadvert upon matters which for the aristocratic temperament do not exist. To ignore, to disdain to consider, to overlook, are the essence of the 'gentleman.' Often most provokingly so; for the things ignored may be of the deepest moral consequence. But in the very midst of our indignation with the gentleman, we have a consciousness that his preposterous inertia and negativeness in the actual emergency is, somehow or other, *allied* with his general superiority to ourselves. It is not only that the gentleman ignores considerations relative to conduct, sordid suspicions, fears, calculations, etc., which the vulgarian is fated to entertain; it is that he is silent where the vulgarian talks; that he gives nothing but results where the vulgarian is profuse of reasons; that he does not explain or apologize; that he uses one sentence instead of twenty; and that, in a word, there is an amount of *interstitial* thinking, so to call it, which it is quite impossible to get him to perform, but which is nearly all that the vulgarian mind performs at all. All this suppression of the secondary leaves the field *clear*,—for higher flights,

should they choose to come. But even if they never came, what thoughts there were would still manifest the aristocratic type and wear the well-bred form. So great is our sense of harmony and ease in passing from the company of a philistine to that of an aristocratic temperament, that we are almost tempted to deem the falsest views and tastes as held by a man of the world, truer than the truest as held by a common person. In the latter the best ideas are choked, obstructed, and contaminated by the redundancy of their paltry associates. The negative conditions, at least, of an atmosphere and a free outlook are present in the former.

I may appear to have strayed from psychological analysis into æsthetic criticism. But the principle of selection is so important that no illustrations seem redundant which may help to show how great is its scope. The upshot of what I say simply is that selection implies rejection as well as choice; and that the function of ignoring, of *inattention*, is as vital a factor in mental progress as the function of attention itself.

[319] The substance of this chapter, and a good many pages of the text, originally appeared in an article entitled 'Brute and Human Intellect,' in the Journal of Speculative Philosophy for July 1878 (vol. xii. p. 236).

[320] I see no need of assuming more than two terms in this sort of reasoning—first, the sign, and second, the thing inferred from it. Either may be complex, but essentially it is but A calling up B, and no middle term is involved. M. Binet, in his most intelligent little book, *La Psychologie du Raisonnement*, maintains that there are three terms. The present sensation or sign must, according to him, first evoke from the past an image which resembles it and fuses with it, and the things suggested or inferred are always the contiguous associates of this intermediate image, and not of the immediate sensation. The reader of [Chapter XIX](#) will see why I do not believe in the 'image' in question as a distinct psychic fact.

[321] *Mental Evolution in Man* (1889), chapters iii and iv. See especially pp. 68-80, and later 353, 396.

[322] *Loc. cit.* p. 50.

[323] P. 52.

[324] *Loc. cit.* p. 74.

[325] J. Locke, *Essay conc. Hum. Understanding*, bk. iv. chap. ii. § 3.

[326] To be sagacious is to be a good observer. J. S. Mill has a passage which is so much in the spirit of the text that I cannot forbear to quote it. "The observer is not he who merely sees the thing which is before his eyes, but he who sees what parts that thing is composed of. To do this well is a rare talent. One person, from inattention, or attending only in the wrong place, overlooks half of what he sees; another sets down much more than he sees, confounding it with what he imagines, or with what he infers; another takes note of the *kind* of all the circumstances, but being inexpert in estimating their degree, leaves the quantity of each vague and uncertain; another sees indeed the whole, but makes such an awkward division of it into parts, throwing things into one mass which require to be separated, and separating others which might more conveniently be considered as one, that the result is much the same, sometimes even worse, than if no analysis had been attempted at all. It would be possible to point out what qualities of mind, and modes of mental culture, fit a person for being a good observer: that, however, is a question not of Logic, but of the Theory of Education, in the most enlarged sense of the term. There is not properly an Art of Observing. There may be rules for observing. But these, like rules for inventing, are properly instructions for the preparation of one's own mind; for putting it into the state in which it will be most fitted to observe, or most likely to invent. They are, therefore, essentially rules of self-education, which is a different thing from Logic. They do not teach how to do the thing, but how to make ourselves capable of doing it. They are an art of strengthening the limbs, not an art of using them. The extent and minuteness of observation which may be requisite, and the degree of decomposition to which it may be necessary to carry the mental analysis, depend on the particular purpose in view. To ascertain the state of the whole universe at any particular moment is impossible, but would also be useless. In making chemical experiments, we do not think it necessary to note the position of the planets; because experience has shown, as a very superficial experience is sufficient to show, that in such cases that circumstance is not material to the result: and accordingly, in the ages when man believed in the occult influences of the heavenly bodies, it might have been unphilosophical to omit ascertaining the precise condition of those bodies at the moment of the experiment." (Logic, bk. iii. chap. vii. § 1. Cf. also bk. iv. chap. ii.)

[327] Readers brought up on Popular Science may think that the molecular structure of things is their real essence in an absolute sense, and that water is H-O-H more deeply and truly than it is a solvent of sugar or a slaker of thirst. Not a whit! It is *all* of these things with equal reality, and the only reason why *for the chemist* it is H-O-H primarily, and only secondarily the other things, is that *for his purpose*

of deduction and compendious definition, the H-O-H aspect of it is the more useful one to bear in mind.

[328] "We find that we take for granted irresistibly that each kind [of thing] has some character which distinguishes it from other classes.... What is the foundation of this postulate? What is the ground of this assumption that there must exist a definition which we have never seen, and which perhaps no one has seen in a satisfactory form?... I reply that our conviction that there must needs be characteristic marks by which things can be defined in words is founded upon the assumption of *the necessary possibility of reasoning*." (W. Whewell: *Hist. of Scientific Ideas*, bk. viii. chap. i, § 9.)

[329] I may quote a passage from an article entitled 'The Sentiment of Rationality,' published in vol. iv of *Mind*, 1879: "What is a *conception*? It is a *teleological instrument*. It is a partial aspect of a thing which *for our purpose* we regard as its essential aspect, as the representative of the entire thing. In comparison with this aspect, whatever other properties and qualities the thing may have are unimportant accidents which we may without blame ignore. But the essence, the ground of conception, varies with the end we have in view. A substance like oil has as many different essences as it has uses to different individuals. One man conceives it as a combustible, another as a lubricator, another as a food; the chemist thinks of it as a hydrocarbon; the furniture-maker as a darkener of wood; the speculator as a commodity whose market-price to-day is this and to-morrow that. The soap-boiler, the physicist, the clothes-scourer severally ascribe to it other essences in relation to their needs. Ueberweg's doctrine that the essential quality of a thing is the quality of most *worth* is strictly true; but Ueberweg has failed to note that the worth is wholly relative to the temporary interests of the conceiver. And, even, when his interest is distinctly defined in his own mind, the discrimination of the quality in the object which has the closest connection with it is a thing which no rules can teach. The only *a priori* advice that can be given to a man embarking on life with a certain purpose is the somewhat barren counsel: Be sure that in the circumstances that meet you, you attend to the *right* ones for your purpose. To pick out the right ones is the measure of the man. 'Millions,' says Hartmann, 'stare at the phenomenon before a *genialer Kopf* pounces on the concept.' The genius is simply he to whom, when he opens his eyes upon the world, the 'right' characters are the prominent ones. The fool is he who, with the same purposes as the genius, infallibly gets his attention tangled amid the accidents."

[330] Only if one of our purposes were itself truer than another, could one of our conceptions become the truer conception. To be a truer purpose, however, our purpose must conform more to some absolute standard of purpose in things to which our purposes ought to conform. This shows that the whole doctrine of essential characters is intimately bound up with a teleological view of the world. Materialism becomes self-contradictory when it denies teleology, and yet in the same breath calls atoms, etc., the *essential* facts. The world contains consciousness as well as atoms—and the one must be written down as just as essential as the other, in the absence of any declared purpose regarding them on the creator's part, or in the absence of any creator. As far as we ourselves go, the atoms are worth more for purposes of deduction, the consciousness for purposes of inspiration. We may fairly write the Universe in either way, thus: ATOMS-producing-consciousness; or CONSCIOUSNESS-produced-by-atoms. Atoms alone, or consciousness alone, are precisely equal mutilations of the truth. If, without believing in a God, I still continue to talk of what the world 'essentially is,' I am just as much entitled to define it as a place in which my nose itches, or as a place where at a certain corner I can get a mess of oysters for twenty cents, as to call it an evolving nebula differentiating and integrating itself. It is hard to say which of the three abstractions is the more rotten or miserable substitute for the world's concrete fulness. To conceive it merely as 'God's work' would be a similar mutilation of it, so long as we said not what God, or what kind of work. The only real truth about the world, apart from particular purposes, is the *total* truth.

[331] Compare Lotze, *Metaphysik*, §§ 58, 67, for some instructive remarks on ways in which the world's constitution might differ from what it actually is. Compare also [Chapter XXVIII](#).

[332] Sometimes, it must be confessed, the conceiver's purpose falls short of reasoning and the only conclusion he cares to reach is the bare naming of the datum. "What is that?" is our first question relative to any unknown thing. And the ease with which our curiosity is quenched as soon as we are supplied with any sort of a name to call the object by, is ridiculous enough. To quote from an unpublished essay by a former student of mine, Mr. R. W. Black: "The simplest end which a thing's predicate can serve is the satisfaction of the desire for unity itself, the mere desire that the thing shall be the same with *something* else. Why, the other day, when I mistook a portrait of Shakespeare for one of Hawthorne, was I not, on psychological principles, as right as if I had correctly named it?—the two pictures had a common essence, bald forehead, mustache, flowing hair. Simply because the only end that could possibly be served by naming it Hawthorne was my desire to have it so. With reference to any other end that classification of it would not serve. And every unity, every identity, every classification is rightly called fanciful unless it serves some other end than the mere satisfaction, emotion, or inspiration caught by momentarily believing in it."

[333] See above, [p. 8](#).

[334] See his Study of Character, chap. xv; also Senses and Intellect, 'Intellect,' chap. ii, the latter half.

[335] Whether the dog has the notion of your being angry or of your property being valuable in any such abstract way as *we* have these notions is more than doubtful. The conduct is more likely an impulsive result of a conspiracy of outward stimuli; the beast *feels like* acting so when these stimuli are present, though conscious of no definite reason why. The distinction of percept and concept is useful here. Some breeds of dogs, e.g. collies, seem instinctively to defend their master's property. The case is similar to that of a dog's barking at people after dark, at whom he would not bark in daylight. I have heard this quoted as evidence of the dog's reasoning power. It is only, as Chapter III has shown us, the impulsive result of a summation of stimuli, and has no connection with reasoning.

In certain stages of the hypnotic trance the subject seems to lapse into the non-analytic state. If a sheet of ruled foolscap paper, or a paper with a fine monotonous ornamental pattern printed on it, be shown to the subject, and *one* of the ruled lines or elements of the pattern be pointed to for an instant, and the paper immediately removed, he will then almost always, when after a short interval the paper is presented to him again, pick out the indicated line or element with infallible correctness. The operator, meanwhile, has either to keep his eye fixed upon it, or to make sure of its position by counting, in order not to lose its place. Just so we may remember a friend's house in a street by the single character of its number rather than by its general look. The trance-subject would seem, in these instances, to surrender himself to the general look. He disperses his attention impartially over the sheet. The place of the particular line touched is part of a 'total effect' which he gets in its entirety, and which would be distorted if another line were touched instead. This total effect is lost upon the normal looker-on, bent as he is on concentration, analysis, and emphasis. What wonder, then, that, under these experimental conditions, the trance-subject excels him in touching the right line again? If he has time given him to count the line, he will excel the trance-subject; but if the time be too short to count, he will best succeed by following the trance-method, abstaining from analysis, and being guided by the 'general look' of the line's place on the sheet. One is surprised at one's success in this the moment one gives up one's habitually analytic state of mind.

Is it too much to say that we have in this dispersion of the attention and subjection to the 'general effect' something like a relapse into the state of mind of brutes? The trance-subject never gives any other reason for his optical discriminations, save that 'it looks so.' So a man, on a road once traversed inattentively before, takes a certain turn for no reason except that *he feels* as if it must be right. He is guided by a sum of impressions, not one of which is emphatic or distinguished from the rest, not one of which is essential, not one of which is *conceived*, but all of which together drive him to a conclusion to which nothing but *that* sum-total leads. Are not some of the wonderful discriminations of animals explicable in the same way? The cow finds her own stanchions in the long stable, the horse stops at the house he has once stopped at in the monotonous street, because no other stanchions, no

other house, yield impartially *all* the impressions of the previous experience. The man, however, by seeking to make some one impression characteristic and essential, prevents the rest from having their effect. So that, if the (for him) essential feature be forgotten or changed, he is too apt to be thrown off altogether, and then the brute or the trance-subject may seem to outstrip him in sagacity.

Dr. Romanes's already quoted distinction between 'receptual' and 'conceptual' thought (published since the body of my text and my note were written) connotes conveniently the difference which I seek to point out. See also his *Mental Evolution in Man*, p. 197 ff., for proofs of the fact that in a receptual way brutes cognize the mental states of other brutes and men.

[336] This matter of confusion is important and interesting. Since confusion is mistaking the wrong part of the phenomenon for the whole, whilst reasoning is, according to our definition, based on the substitution of the right part for the whole, it might be said that confusion and reasoning are generically the same process. I believe that they are so, and that the only difference between a muddle-head and a genius is that between extracting wrong characters and right ones. In other words, a muddle-headed person is a genius spoiled in the making. I think it will be admitted that all *eminently* muddle-headed persons have the temperament of genius. They are constantly breaking away from the usual consecutions of concretes. A common associator by contiguity is too closely tied to routine to get muddle-headed.

[337] The horse is a densely stupid animal, as far as everything goes except contiguous association. We reckon him intelligent, partly because he looks so handsome, partly because he has such a wonderful faculty of contiguous association and can be so quickly moulded into a mass of set habits. Had he anything of reasoning intelligence, he would be a less faithful slave than he is.

[338] Th. Schumann: *Journal Daheim*, No. 19, 1878. Quoted by Strümpell: *Die Geisteskräfte der Menschen verglichen mit denen der Thiere* (Leipzig, 1878), p. 39. Cats are notorious for the skill with which they will open latches, locks, etc. Their feats are usually ascribed to their reasoning powers. But Dr. Romanes well remarks (*Mental Evolution*, etc., p. 351, note) that we ought first to be sure that the actions are not due to mere association. A cat is constantly playing with things with her paws; a trick accidentally hit upon may be retained. Romanes notes the fact that the animals most skilled in this way need not be the most generally intelligent, but those which have the best corporeal members for handling things, cat's paws, horse's lips, elephant's trunk, cow's horns. The monkey has both the corporeal and the intellectual superiority. And my deprecatory remarks on animal reasoning in the text apply far less to the quadrumana than to quadrupeds.—On the possible fallacies in interpreting animals' minds, compare C. L. Morgan in *Mind*, xi. 174 (1886).

[339] There are two other conditions of language in the human being, additional to association by similarity, that assist its action, or rather pave the way for it. These are: first, the great natural loquacity; and, second, the great imitiveness of man. The first produces the original reflex interjectional sign; the second (as Bleek has well shown) fixes it, stamps it, and ends by multiplying the number of determinate specific signs which are a requisite preliminary to the general conscious purpose of sign-making, which I have called the characteristic human element in language. The way in which imitiveness fixes the meaning of signs is this: When a primeval man has a given emotion, he utters his natural interjection; or when (to avoid supposing that the reflex sounds are exceedingly determinate by nature) a group of such men experience a common emotion, and one takes the lead in the cry, the others cry like him from sympathy or imitiveness. Now, let one of the group hear another, who is in presence of the experience, utter the cry; he, even without the experience, will repeat the cry from pure imitiveness. But, as he repeats the sign, he will be reminded by it of his own former experience. Thus, first, he has the sign with the emotion; then, without it; then, with it again. It is "dissociated by change of concomitants"; he feels it as a separate entity and yet as having a connection with the emotion. Immediately it becomes possible for him to couple it deliberately with the emotion, in cases where the latter would either have provoked no interjectional cry or not the same one. In a word, his mental procedure tends to *fix* this cry on *that* emotion; and when this occurs, in

many instances, he is provided with a stock of signs, like the yelp, beg, rat of the dog, each of which suggests a determinate image. On this stock, then, similarity works in the way above explained.

[340] See the 'Evolution of Self-consciousness' in 'Philosophical Discussions,' by Chauncey Wright (New York: Henry Holt & Co., 1877). Dr. Romanes, in the book from which I have already quoted, seeks to show that the 'consciousness of truth as truth' and the deliberate intention to predicate (which are the characteristics of higher human reasoning) presuppose a consciousness of ideas as such, as things distinct from their objects; and that this consciousness depends on our having made signs for them by language. My text seems to me to include Dr. Romanes's facts, and formulates them in what to me is a more elementary way, though the reader who wishes to understand the matter better should go to his clear and patient exposition also.

[341] Study of Character, p. 317.

[342] Translated by my colleague, Professor G. H. Palmer.

[343] Quoted by Renouvier, Critique Philosophique, October 19, 1879.

[344] Social and domestic circumstances, that is, not material ones. Perceptions of social relations seem very keen in persons whose dealings with the material world are confined to knowing a few useful objects, principally animals, plants, and weapons. Savages and boors are often as tactful and astute socially as trained diplomatists. In general, it is probable that the consciousness of how one stands with other people occupies a relatively larger and larger part of the mind, the lower one goes in the scale of culture. Woman's intuitions, so fine in the sphere of personal relations, are seldom first-rate in the way of mechanics. All boys teach themselves how a clock goes: few girls. Hence Dr. Whately's jest, "Woman is the unreasoning animal, and pokes the fire from on top."

CHAPTER XXIII.

THE PRODUCTION OF MOVEMENT.

The reader will not have forgotten, in the jungle of purely inward processes and products through which the last chapters have borne him, that the final result of them all must be some form of bodily activity due to the escape of the central excitement through outgoing nerves. The whole neural organism, it will be remembered, is, physiologically considered, but a machine for converting stimuli into reactions; and the intellectual part of our life is knit up with but the middle or 'central' portion of the machine's operations. Let us now turn to consider the final or emergent operations, the bodily activities, and the forms of consciousness connected therewithal.

Every impression which impinges on the incoming nerves produces some discharge down the outgoing ones, whether we be aware of it or not. Using sweeping terms and ignoring exceptions, *we might say that every possible*

feeling produces a movement, and that the movement is a movement of the entire organism, and of each and all its parts. What happens patently when an explosion or a flash of lightning startles us, or when we are tickled, happens latently with every sensation which we receive. The only reason why we do not feel the startle or tickle in the case of insignificant sensations is partly its very small amount, partly our obtuseness. Professor Bain many years ago gave the name of the Law of Diffusion to this phenomenon of general discharge, and expressed it thus: "According as an impression is accompanied with Feeling, the aroused currents diffuse themselves over the brain, leading to a general agitation of the moving organs, as well as affecting the viscera."

In cases where the feeling is strong the law is too familiar to require proof. As Prof. Bain says:

"Each of us knows in our own experience that a sudden shock of feeling is accompanied with movements of the body generally, and with other effects. When no emotion is present, we are quiescent; a slight feeling is accompanied with slight manifestations; a more intense shock has a more intense outburst. Every pleasure and every pain, and every mode of emotion, has a definite wave of effects, which our observation makes known to us; and we apply the knowledge to infer other men's feelings from their outward display.... The organs first and prominently affected, in the diffused wave of nervous influence, are the moving members, and of these, by preference, the features of the face (with the ears in animals), whose movements constitute the *expression* of the countenance. But the influence extends to all the parts of the moving system, voluntary and involuntary; while an important series of effects are produced on the glands and viscera—the stomach, lungs, heart, kidneys, skin, together with the sexual and mammary organs.... The circumstance is seemingly universal, the proof of it does not require a citation of instances in detail; on the objectors is thrown the burden of adducing unequivocal exceptions to the law."^[345]

There are probably no exceptions to the diffusion of every impression through the *nerve-centres*. The *effect* of the wave through the centres may, however, often be to interfere with processes, and to diminish tensions already existing there; and the outward consequences of such inhibitions

may be the arrest of discharges from the inhibited regions and the checking of bodily activities already in process of occurrence. When this happens it probably is like the draining or siphoning of certain channels by currents flowing through others. When, in walking, we suddenly stand still because a sound, sight, smell, or thought catches our attention, something like this occurs. But there are cases of arrest of peripheral activity which depend, not on central inhibition, but on stimulation of centres which discharge outgoing currents of an inhibitory sort. Whenever we are startled, for example, our heart momentarily stops or slows its beating, and then palpitates with accelerated speed. The brief arrest is due to an outgoing current down the pneumogastric nerve. This nerve, when stimulated, stops or slows the heart-beats, and this particular effect of startling fails to occur if the nerve be cut.

In general, however, the stimulating effects of a sense-impression preponderate over the inhibiting effects, so that we may roughly say, as we began by saying, that the wave of discharge produces an activity in all parts of the body. The task of tracing out *all* the effects of any one incoming sensation has not yet been performed by physiologists. Recent years have, however, begun to enlarge our information; and although I must refer to special treatises for the full details, I can briefly string together here a number of separate observations which prove the truth of the law of diffusion.

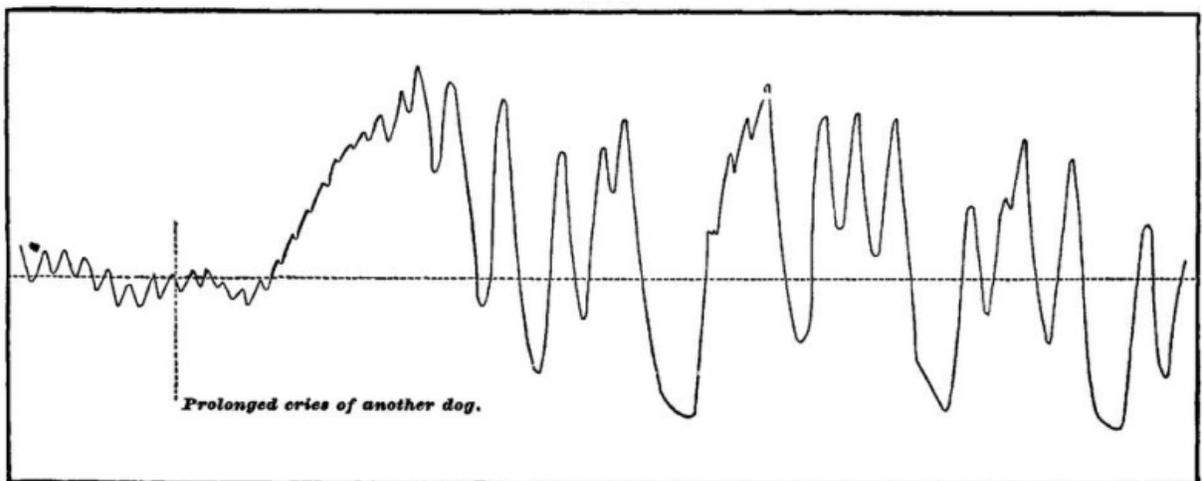


FIG. 81.

First take *effects upon the circulation*. Those upon the heart we have just seen. Haller long ago recorded that the blood from an open vein flowed out faster at the beat of a drum.^[346] In Chapter III. (Vol. I. p. 98) we learned how

instantaneously, according to Mosso, the circulation in the brain is altered by changes of sensation and of the course of thought. The effect of objects of fear, shame, and anger upon the blood-supply of the skin, especially the skin of the face, are too well known to need remark. Sensations of the higher senses produce, according to Couty and Charpentier, the most varied effects upon the pulse-rate and blood-pressure in dogs. Fig. 81, a pulse-tracing from these authors, shows the tumultuous effect on a dog's heart of hearing the screams of another dog. The changes of blood-pressure still occurred when the pneumogastric nerves were cut, showing the vaso-motor effect to be direct and not dependent on the heart. When Mosso invented that simple instrument, the *plethysmograph*, for recording the fluctuations in volume of the members of the body, what most astonished him, he says, "in the first experiments which he made in Italy, was the extreme unrest of the blood-vessels of the hand, which at every smallest emotion, whether during waking or during sleep, changed their volume in surprising fashion."^[347] Figure 82 (from Féré^[348])^[Pg 375]

^[Pg 376] shows the way in which the pulse of one subject was modified by the exhibition of a red light lasting from the moment marked *a* to that marked *b*.

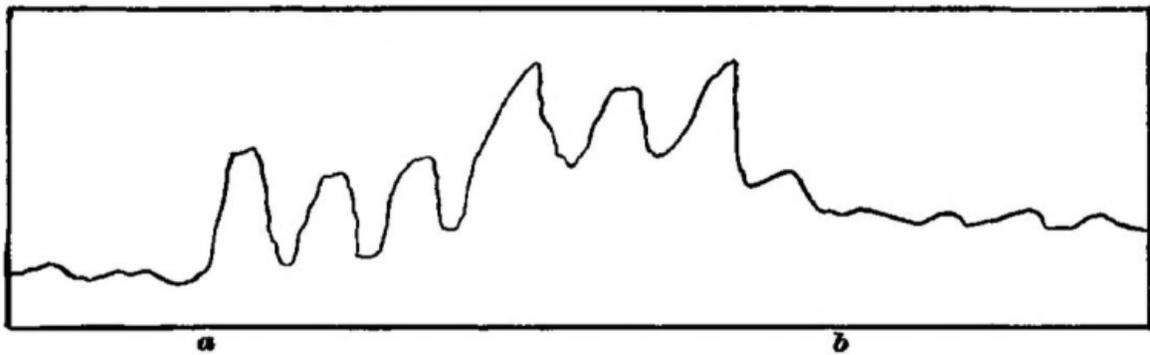


FIG. 82.

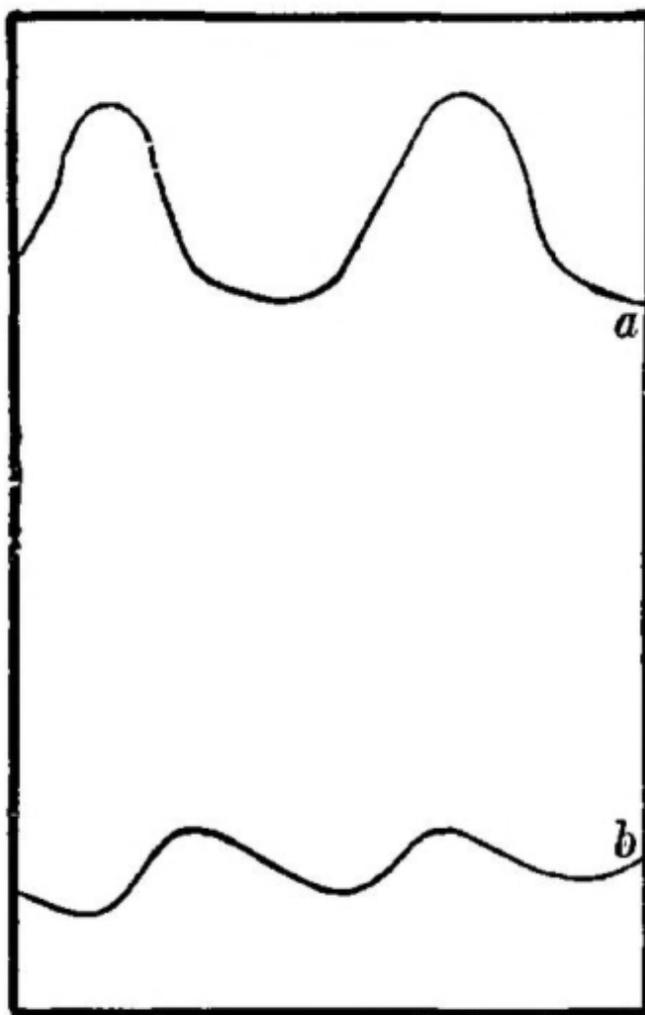


FIG. 83.—Respiratory curve of B: *a*, with eyes open; *b*, with eyes closed.

The effects upon respiration of sudden sensory stimuli are also too well known to need elaborate comment. We 'catch our breath' at every sudden sound. We 'hold our breath' whenever our attention and expectation are strongly engaged, and we sigh when the tension of the situation is relieved. When a fearful object is before us we pant and cannot deeply inspire; when the object makes us angry it is, on the contrary, the act of expiration which is hard. I subjoin a couple of figures from Féré which explain themselves. They show the effects of light upon the breathing of two of his hysteric patients.

[349]

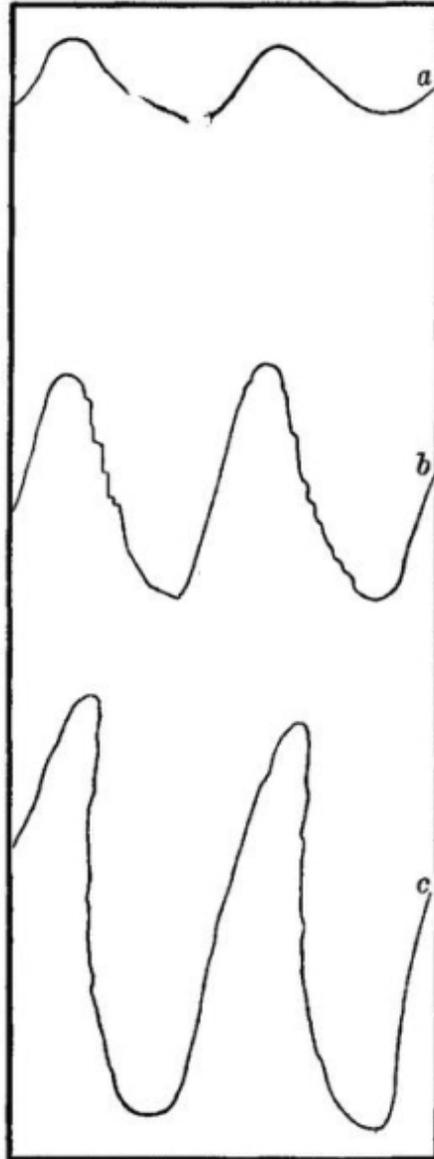


FIG. 84. Respiratory curve of L: a, with yellow light; b with green light; c, with red light. The red has the strongest effect.

On the sweat-glands, similar consequences of sensorial stimuli are observed. Tarchanoff, testing the condition of the sweat-glands by the power of the skin to start a galvanic current through electrodes applied to its surface, found that "nearly every kind of nervous activity, from the simplest sensations and impressions, to voluntary motions and the highest forms of mental exertion, is accompanied by an increased activity in the glands of the skin."^[350] *On the pupil* observations are recorded by Sanders which show that a transitory dilatation follows every sensorial stimulus applied *during sleep*, even if the stimulus be not strong enough to wake the subject up. At

the moment of awaking there is a dilatation, even if strong light falls on the eye.^[351] The pupil of children can easily be observed to dilate enormously under the influence of *fear*. It is said to dilate in pain and fatigue; and to contract, on the contrary, in rage.

As regards *effects on the abdominal viscera*, they unquestionably exist, but very few accurate observations have been made.^[352]

The bladder, bowels, and uterus respond to sensations, even indifferent ones. Mosso and Pellicani, in their plethysmographic investigations on the bladder of dogs, found all sorts of sensorial stimuli to produce reflex contractions of this organ, independent of those of the abdominal walls. They call the bladder 'as good an æsthesiometer as the iris,' and refer to the not uncommon reflex effects of psychic stimuli in the human female upon this organ.^[353] M. Féré has registered the contractions of the sphincter ani which even indifferent sensations will produce. In some pregnant women the fœtus is felt to move after almost every sensorial excitement received by the mother. The only natural explanation is that it is stimulated at such moments by reflex contractions of the womb.^[354] That the glands are affected in emotion is patent enough in the case of the tears of grief, the dry mouth, moist skin, or diarrhœa of fear, the biliary disturbances which sometimes follow upon rage, etc. The watering of the mouth at the sight of succulent food is well known. It is difficult to follow the smaller degrees of all these reflex changes, but it can hardly be doubted that they exist in some degree, even where they cease to be traceable, and that all our sensations have some visceral effects. The sneezing produced by sunshine, the roughening of the skin (goose-flesh) which certain strokings, contacts, and sounds, musical or non-musical, provoke, are facts of the same order as the shuddering and standing up of the hair in fear, only of less degree.

Effects on Voluntary Muscles. Every sensorial stimulus not only sends a special discharge into certain particular muscles dependent on the special nature of the stimulus in question—some of these special discharges we have studied in Chapter XI, others we shall examine under the heads of Instinct and Emotion—but it innervates the muscles generally. M. Féré has given very curious experimental proofs of this. The strength of contraction of the subject's hand was measured by a self-registering dynamometer. Ordinarily the maximum strength, under simple experimental conditions, remains the same from day to day. But if simultaneously with the contraction

the subject received a sensorial impression, the contraction was sometimes weakened, but more often increased. This reinforcing effect has received the name of *dynamogeny*. The dynamogenic value of simple *musical notes* seems to be proportional to their loudness and height. Where the notes are compounded into sad strains, the muscular strength diminishes. If the strains are gay, it is increased.—The dynamogenic value of *colored lights* varies with the color. In a subject^[355] whose normal strength was expressed by 23, it became 24 when a blue light was thrown on the eyes, 28 for green, 30 for yellow, 35 for orange, and 42 for red. Red is thus the most exciting color. Among *tastes*, sweet has the lowest value, next comes salt, then bitter, and finally sour, though, as M. Féré remarks, such a sour as acetic acid excites the nerves of pain and smell as well as of taste. The stimulating effects of tobacco-smoke, alcohol, beef-extract (which is innutritious), etc., etc., may be partly due to a dynamogenic action of this sort.—Of *odors*, that of musk seems to have a peculiar dynamogenic power. Fig. 85 is a copy of one of M. Féré's dynamographic tracings, which explains itself. The smaller contractions are those without stimulus; the stronger ones are due to the influence of red rays of light.

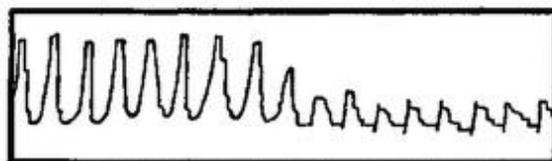


FIG. 85.

Everyone is familiar with the *patellar reflex*, or jerk upwards of the foot, which is produced by smartly tapping the tendon below the knee-pan when the leg hangs over the other knee. Drs. Weir Mitchell and Lombard have found that when other sensations come in simultaneously with the tap, the jerk is increased.^[356] Heat, cold, pricking, itching, or faradic stimulation of the skin, sometimes strong optical impressions, music, all have this dynamogenic effect, which also results whenever voluntary movements are set up in other parts of the body, simultaneously with the tap.^[357]

These 'dynamogenic' effects, in which one stimulation simply reinforces another already under way, must not be confounded with reflex acts properly so called, in which new activities are originated by the stimulus. All instinctive performances and manifestations of emotion are reflex acts. But underneath those of which we are conscious there seem to go on continually

others smaller in amount, which probably in most persons might be called fluctuations of muscular *tone*, but which in certain neurotic subjects can be demonstrated ocularly. M. Féré figures some of them in the article to which I have already referred.^[358]

Looking back over all these facts, it is hard to doubt the truth of the law of diffusion, even where verification is beyond reach. *A process set up anywhere in the centres reverberates everywhere, and in some way or other affects the organism throughout, making its activities either greater or less.* We are brought again to the assimilation which was expressed on a previous page of the nerve-central mass to a good conductor charged with electricity, of which the tension cannot be changed anywhere without changing it everywhere.

Herr Schneider has tried to show, by an ingenious and suggestive zoological review,^[359] that all the *special* movements which highly evolved animals make are differentiated from the two originally simple movements, of contraction and expansion, in which the entire body of simple organisms takes part. The tendency to contract is the source of all the self-protective impulses and reactions which are later developed, including that of flight. The tendency to expand splits up, on the contrary, into the impulses and instincts of an aggressive kind, feeding, fighting, sexual intercourse, etc. Schneider's articles are well worth reading, if only for the careful observations on animals which they embody. I cite them here as a sort of evolutionary reason to add to the mechanical *a priori* reason why there *ought* to be the diffusive wave which our *a posteriori* instances have shown to exist.

I will now proceed to a detailed study of the more important classes of movement consequent upon cerebro-mental change. They may be enumerated as—

1) Instinctive or Impulsive Performances;

2) Expressions of Emotion; and
3) Voluntary Deeds;
and each shall have a chapter to itself.

[345] Emotions and Will, pp. 4, 5.

[346] Cf. Féré. Sensation et Mouvement (1887), p. 56.

[347] La Paura (1884), p. 117. Compare Féré: Sensation et Mouvement, chap. xvii.

[348] Revue Philosophique, xxiv. 570.

[349] Revue Phil., xxiv. pp. 566-7.—For further information about the relations between the brain and respiration, see Danilewsky's Essay in the Biologisches Centralblatt, ii. 690.

[350] Quoted from the report of Tarchanoff's paper (in Pflüger's Archiv, xlvi. 46) in the American Journal of Psych., ii. 652.

[351] Archiv f. Psychiatrie, vii. 652; ix. 129.

[352] Sensation et Mouvement, 57-8.

[353] R. Accad. dei Lincei (1881-2). I follow the report in Hofmann Schwalbe's Jahresbericht, x. ii. 93.

[354] Cf. Féré, Sensation et Mouvement, chap. xiv.

[355] The figures given are from an hysterical subject, and the differences are greater than normal. M. Féré considers that the unstable nervous system of the hysteric ('ces grenouilles de la psychologie') shows the law on a quantitatively exaggerated scale, without altering the qualitative relations. The effects remind us a little of the influence of sensations upon minimal sensations of other orders discovered by Urbantschitsch, and reported on [page 29](#) of this volume.

[356] Mitchell in (Philadelphia) Medical News (Feb. 13 and 20, 1886); Lombard in American Journal of Psychology (Oct. 1887).

[357] Prof. H. P. Bowditch has made the interesting discovery that if the reinforcing movement be as much as 0.4 of a second late, the reinforcement fails to occur, and is transformed into a positive inhibition of the knee-jerk for retardations of between 0.4' and 1.7'. The knee-jerk fails to be modified at all by voluntary movements made later than 1.7' after the patellar ligament is tapped (see Boston Med. and Surg. Journ., May 31, 1888).

[358] Revue Phil., xxiv. 572 ff.

[359] In the Vierteljahrschrift für wiss. Philos., iii. 294.

CHAPTER XXIV.^[360]

INSTINCT.

Instinct is usually defined as the faculty of acting in such a way as to produce certain ends, without foresight of the ends, and without previous education in the performance. That instincts, as thus defined, exist on an enormous scale in the animal kingdom needs no proof. They are the functional correlatives of structure. With the presence of a certain organ goes, one may say, almost always a native aptitude for its use.

"Has the bird a gland for the secretion of oil? She knows instinctively how to press the oil from the gland, and apply it to the feather. Has the rattlesnake the grooved tooth and gland of poison? He knows without instruction how to make both structure and function most effective against his enemies. Has the silk-worm the function of secreting the fluid silk? At the proper time she winds the cocoon such as she has never seen, as thousands before have done; and thus without

instruction, pattern, or experience, forms a safe abode for herself in the period of transformation. Has the hawk talons? She knows by instinct how to wield them effectively against the helpless quarry."^[361]

A very common way of talking about these admirably definite tendencies to act is by naming abstractly the purpose they subserve, such as self-preservation, or defence, or care for eggs and young—and saying the animal has an instinctive fear of death or love of life, or that she has an instinct of self-preservation, or an instinct of maternity and the like. But this represents the animal as obeying abstractions which not once in a million cases is it possible it can have framed. The strict physiological way of interpreting the facts leads to far clearer results. *The actions we call instinctive all conform to the general reflex type; they are called forth by determinate sensory stimuli in contact with the animal's body, or at a distance in his environment. The cat runs after the mouse, runs or shows fight before the dog, avoids falling from walls and trees, shuns fire and water, etc., not because he has any notion either of life or of death, or of self, or of preservation. He has probably attained to no one of these conceptions in such a way as to react definitely upon it. He acts in each case separately, and simply because he cannot help it; being so framed that when that particular running thing called a mouse appears in his field of vision he *must* pursue; that when that particular barking and obstreperous thing called a dog appears there he *must* retire, if at a distance, and scratch if close by; that he *must* withdraw his feet from water and his face from flame, etc. His nervous system is to a great extent a preorganized bundle of such reactions—they are as fatal as sneezing, and as exactly correlated to their special excitants as it is to its own. Although the naturalist may, for his own convenience, class these reactions under general heads, he must not forget that in the animal it is a particular sensation or perception, or image which calls them forth.*

At first this view astounds us by the enormous number of special adjustments it supposes animals to possess ready-made in anticipation of the outer things among which they are to dwell. *Can* mutual dependence be so intricate and go so far? Is each thing born fitted to particular other things, and to them exclusively, as locks are fitted to their keys? Undoubtedly this must be believed to be so. Each nook and cranny of creation, down to our very skin and entrails, has its living inhabitants, with organs suited to the

place, to devour and digest the food it harbors and to meet the dangers it conceals; and the minuteness of adaptation thus shown in the way of *structure* knows no bounds. Even so are there no bounds to the minuteness of adaptation in the way of *conduct* which the several inhabitants display.

The older writings on instinct are ineffectual wastes of words, because their authors never came down to this definite and simple point of view, but smothered everything in vague wonder at the clairvoyant and prophetic power of the animals—so superior to anything in man—and at the beneficence of God in endowing them with such a gift. But God's beneficence endows them, first of all, with a nervous system; and, turning our attention to this, makes instinct immediately appear neither more nor less wonderful than all the other facts of life.

Every instinct is an impulse. Whether we shall call such impulses as blushing, sneezing, coughing, smiling, or dodging, or keeping time to music, instincts or not, is a mere matter of terminology. The process is the same throughout. In his delightfully fresh and interesting work, *Der Thierische Wille*, Herr G. H. Schneider subdivides impulses (*Triebe*) into sensation-impulses, perception-impulses, and idea-impulses. To crouch from cold is a sensation-impulse; to turn and follow, if we see people running one way, is a perception-impulse; to cast about for cover, if it begins to blow and rain, is an imagination-impulse. A single complex instinctive action may involve successively the awakening of impulses of all three classes. Thus a hungry lion starts to *seek* prey by the awakening in him of imagination coupled with desire; he begins to *stalk* it when, on eye, ear, or nostril, he gets an impression of its presence at a certain distance; he *springs* upon it, either when the booty takes alarm and flees, or when the distance is sufficiently reduced; he proceeds to *tear* and *devour* it the moment he gets a sensation of its contact with his claws and fangs. Seeking, stalking, springing, and devouring are just so many different kinds of muscular contraction, and neither kind is called forth by the stimulus appropriate to the other.

Schneider says of the hamster, which stores corn in its hole:

"If we analyze the propensity of storing, we find that it consists of three impulses: First, an impulse to *pick up* the nutritious object, due to perception; second, an impulse to *carry it off* into the dwelling-place, due to the idea of this latter; and third, an impulse to *lay it down* there, due to the sight of the place. It lies in the nature of the hamster that it should never see a full ear of corn without feeling a desire to strip it; it lies in its nature to feel, as soon as its cheek-pouches are filled, an irresistible desire to hurry to its home; and finally, it lies in its nature that the sight of the storehouse should awaken the impulse to empty the cheeks" (p. 208).

In certain animals of a low order the feeling of having executed one impulsive step is such an indispensable part of the stimulus of the next one, that the animal cannot make any variation in the order of its performance.

Now, why do the various animals do what seem to us such strange things, in the presence of such outlandish stimuli? Why does the hen, for example, submit herself to the tedium of incubating such a fearfully uninteresting set of objects as a nestful of eggs, unless she have some sort of a prophetic inkling of the result? The only answer is ad hominem. We can only interpret the instincts of brutes by what we know of instincts in ourselves. Why do men always lie down, when they can, on soft beds rather than on hard floors? Why do they sit round the stove on a cold day? Why, in a room, do they place themselves, ninety-nine times out of a hundred, with their faces towards its middle rather than to the wall? Why do they prefer saddle of mutton and champagne to hard-tack and ditch-water? Why does the maiden interest the youth so that everything about her seems more important and significant than anything else in the world? Nothing more can be said than that these are human ways, and that every creature likes its own ways, and takes to the following them as a matter of course. Science may come and consider these ways, and find that most of them are useful. But it is not for the sake of their utility that they are followed, but because at the moment of following them we feel that that is the only appropriate and natural thing to do. Not one man in a billion, when taking his dinner, ever thinks of utility. He eats because the food tastes good and makes him want more. If you ask

him *why* he should want to eat more of what tastes like that, instead of revering you as a philosopher he will probably laugh at you for a fool. The connection between the savory sensation and the act it awakens is for him absolute and *selbstverständlich*, an '*a priori* synthesis' of the most perfect sort, needing no proof but its own evidence. It takes, in short, what Berkeley calls a mind debauched by learning to carry the process of making the natural seem strange, so far as to ask for the *why* of any instinctive human act. To the metaphysician alone can such questions occur as: Why do we smile, when pleased, and not scowl? Why are we unable to talk to a crowd as we talk to a single friend? Why does a particular maiden turn our wits so upside-down? The common man can only say, "*Of course* we smile, *of course* our heart palpitates at the sight of the crowd, *of course* we love the maiden, that beautiful soul clad in that perfect form, so palpably and flagrantly made from all eternity to be loved!"

And so, probably, does each animal feel about the particular things it tends to do in presence of particular objects. They, too, are *a priori* syntheses. To the lion it is the lioness which is made to be loved; to the bear, the she-bear. To the broody hen the notion would probably seem monstrous that there should be a creature in the world to whom a nestful of eggs was not the utterly fascinating and precious and never-to-be-too-much-sat-upon object which it is to her.^[362]

Thus we may be sure that, however mysterious some animals' instincts may appear to us, our instincts will appear no less mysterious to them. And we may conclude that, to the animal which obeys it, every impulse and every step of every instinct shines with its own sufficient light, and seems at the moment the only eternally right and proper thing to do. It is done for its own sake exclusively. What voluptuous thrill may not shake a fly, when she at last discovers the one particular leaf, or carrion, or bit of dung, that out of all the world can stimulate her ovipositor to its discharge? Does not the discharge then seem to her the only fitting thing? And need she care or know anything about the future maggot and its food?

Since the *egg-laying instincts* are simple examples to consider, a few quotations about them from Schneider may be serviceable:

"The phenomenon so often talked about, so variously interpreted, so surrounded with mystification, that an insect should always lay her eggs in a spot appropriate to the nourishment of her young, is no more marvellous than the phenomenon that every animal pairs with a mate capable of bearing posterity, or feeds on materials capable of affording him nourishment.... Not only the choice of a place for laying the eggs, but all the various acts for depositing and protecting them, are occasioned by the perception of the proper object, and the relation of this perception to the various stages of maternal impulse. When the burying beetle perceives a carrion, she is not only impelled to approach it and lodge her eggs in it, but also to go through the movements requisite for burying it; just as a bird who sees his hen-bird is impelled to caress her, to strut around her, dance before her, or in some other way to woo her; just as a tiger, when he sees an antelope, is impelled to stalk it, to pounce upon it, and to strangle it. When the tailor-bee cuts out pieces of rose-leaf, bends them, carries them into a caterpillar- or mouse-hole in trees or in the earth, covers their seams again with other pieces, and so makes a thimble-shaped case—when she fills this with honey and lays an egg in it, all these various appropriate expressions of her will are to be explained by supposing that at the time when the eggs are ripe within her, the appearance of a suitable caterpillar- or mouse-hole and the perception of rose-leaves are so correlated in the insect with the several impulses in question, that the performances follow as a matter of course when the perceptions take place....

"The perception of the empty nest, or of a single egg, seems in birds to stand in such a close relation to the physiological functions of oviparation, that it serves as a direct stimulus to these functions, while the perception of a sufficient number of eggs has just the opposite effect. It is well known that hens and ducks lay more eggs if we keep removing them than if we leave them in the nest. The impulse to sit arises, as a rule, when a bird sees a certain number of eggs in her nest. If this number is not yet to be seen there, the ducks continue to lay, although they perhaps have laid twice as many eggs as they are

accustomed to sit upon.... That sitting, also, is independent of any idea of purpose and is a pure perception-impulse is evident, among other things, from the fact that many birds, e.g. wild ducks, steal eggs from each other.... The bodily disposition to sit is, it is true, one condition [since broody hens will sit where there are no eggs], but the perception of the eggs is the other condition of the activity of the incubating impulse. The propensity of the cuckoo and of the cow-bird to lay their eggs in the nests of other species must also be interpreted as a pure perception-impulse. These birds have no bodily disposition to become broody, and there is therefore in them no connection between the perception of an egg and the impulse to sit upon it. Eggs ripen, however, in their oviducts, and the body tends to get rid of them. And since the two birds just named do not drop their eggs anywhere on the ground, but in nests, which are the only places where they may preserve the species, it might easily appear that such preservation of the species was what they had in view, and that they acted with full consciousness of the purpose. But this is not so.... The cuckoo is simply excited by the perception of quite determinate sorts of nest, which already contain eggs, to drop her own into them, and throw the others out, because this perception is a direct stimulus to these acts. It is impossible that she should have any notion of the other bird coming and sitting on her egg."^[363]

INSTINCTS NOT ALWAYS BLIND OR INVARIABLE.

Remember that nothing is said yet of the origin of instincts, but only of the constitution of those that exist fully formed. How stands it with the instincts of mankind?

Nothing is commoner than the remark that Man differs from lower creatures by the almost total absence of instincts, and the assumption of their work in him by 'reason.' A fruitless discussion might be waged on this point by two theorizers who were careful not to define their terms. 'Reason' might be used, as it often has been, since Kant, not as the mere power of 'inferring,' but also as a name for the *tendency to obey impulses* of a certain lofty sort, such as duty, or universal ends. And 'instinct' might have its significance so broadened as to cover all impulses whatever, even the impulse to act from

the idea of a distant fact, as well as the impulse to act from a present sensation. Were the word instinct used in this broad way, it would of course be impossible to restrict it, as we began by doing, to actions done with no prevision of an end. We must of course avoid a quarrel about words, and the facts of the case are really tolerably plain. Man has a far greater variety of *impulses* than any lower animal; and any one of these impulses, taken in itself, is as 'blind' as the lowest instinct can be; but, owing to man's memory, power of reflection, and power of inference, they come each one to be felt by him, after he has once yielded to them and experienced their results, in connection with a *foresight* of those results. In this condition an impulse acted out may be said to be acted out, in part at least, *for the sake* of its results. It is obvious that *every instinctive act, in an animal with memory, must cease to be 'blind' after being once repeated*, and must be accompanied with foresight of its 'end' just so far as that end may have fallen under the animal's cognizance. An insect that lays her eggs in a place where she never sees them hatched must always do so 'blindly;' but a hen who has already hatched a brood can hardly be assumed to sit with perfect 'blindness' on her second nest. Some expectation of consequences must in every case like this be aroused; and this expectation, according as it is that of something desired or of something disliked, must necessarily either re-enforce or inhibit the mere impulse. The hen's idea of the chickens would probably encourage her to sit; a rat's memory, on the other hand, of a former escape from a trap would neutralize his impulse to take bait from anything that reminded him of that trap. If a boy sees a fat hopping-toad, he probably has incontinently an impulse (especially if with other boys) to smash the creature with a stone, which impulse we may suppose him blindly to obey. But something in the expression of the dying toad's clasped hands suggests the meanness of the act, or reminds him of sayings he has heard about the sufferings of animals being like his own; so that, when next he is tempted by a toad, an idea arises which, far from spurring him again to the torment, prompts kindly actions, and may even make him the toad's champion against less reflecting boys.

It is plain, then, that, *no matter how well endowed an animal may originally be in the way of instincts, his resultant actions will be much modified if the instincts combine with experience*, if in addition to impulses he have memories, associations, inferences, and expectations, on any considerable scale. An object O, on which he has an instinctive impulse to react in the

manner A, would *directly* provoke him to that reaction. But O has meantime become for him a *sign* of the nearness of P, on which he has an equally strong impulse to react in the manner B, quite unlike A. So that when he meets O the immediate impulse A and the remote impulse B struggle in his breast for the mastery. The fatality and uniformity said to be characteristic of instinctive actions will be so little manifest that one might be tempted to deny to him altogether the possession of any instinct about the object O. Yet how false this judgment would be! The instinct about O is there; only by the complication of the associative machinery it has come into conflict with another instinct about P.

Here we immediately reap the good fruits of our simple physiological conception of what an instinct is. If it be a mere excito-motor impulse, due to the pre-existence of a certain 'reflex arc' in the nerve-centres of the creature, of course it must follow the law of all such reflex arcs. One liability of such arcs is to have their activity 'inhibited,' by other processes going on at the same time. It makes no difference whether the arc be organized at birth, or ripen spontaneously later, or be due to acquired habit, it must take its chances with all the other arcs, and sometimes succeed, and sometimes fail, in drafting off the currents through itself. The mystical view of an instinct would make it invariable. The physiological view would require it to show occasional irregularities in any animal in whom the number of separate instincts, and the possible entrance of the same stimulus into several of them, were great. And such irregularities are what every superior animal's instincts do show in abundance.^[364]

Wherever the mind is elevated enough to discriminate; wherever several distinct sensory elements must combine to discharge the reflex-arc; wherever, instead of plunging into action instantly at the first rough intimation of what *sort* of a thing is there, the agent waits to see which *one* of its kind it is and what the *circumstances* are of its appearance; wherever different individuals and different circumstances can impel him in different ways; wherever these are the conditions—we have a masking of the elementary constitution of the instinctive life. The whole story of our dealings with the lower wild animals is the history of our taking advantage of the way in which they judge of everything by its mere label, as it were, so as to ensnare or kill them. Nature, in them, has left matters in this rough way, and made them act *always* in the manner which would be *oftenest*

right. There are more worms unattached to hooks than impaled upon them; therefore, on the whole, says Nature to her fishy children, bite at *every* worm and take your chances. But as her children get higher, and their lives more precious, she reduces the risks. Since what seems to be the same object may be now a genuine food and now a bait; since in gregarious species each individual may prove to be either the friend or the rival, according to the circumstances, of another; since any entirely unknown object may be fraught with weal or woe, *Nature implants contrary impulses to act on many classes of things*, and leaves it to slight alterations in the conditions of the individual case to decide which impulse shall carry the day. Thus, greediness and suspicion, curiosity and timidity, coyness and desire, bashfulness and vanity, sociability and pugnacity, seem to shoot over into each other as quickly, and to remain in as unstable equilibrium, in the higher birds and mammals as in man. They are all impulses, congenital, blind at first, and productive of motor reactions of a rigorously determinate sort. *Each one of them, then, is an instinct*, as instincts are commonly defined. *But they contradict each other*—'experience' in each particular opportunity of application usually deciding the issue. *The animal that exhibits them, loses the 'instinctive' demeanor* and appears to lead a life of hesitation and choice, an intellectual life; *not, however, because he has no instincts—rather because he has so many that they block each other's path.*

Thus, then, without troubling ourselves about the words instinct and reason, we may confidently say that however uncertain man's reactions upon his environment may sometimes seem in comparison with those of lower creatures, the uncertainty is probably not due to their possession of any principles of action which he lacks. *On the contrary, man possesses all the impulses that they have, and a great many more besides.* In other words, there is no material antagonism between instinct and reason. Reason, *per se*, can inhibit no impulses; the only thing that can neutralize an impulse is an impulse the other way. Reason may, however, make an *inference which will excite the imagination so as to set loose* the impulse the other way; and thus, though the animal richest in reason might be also the animal richest in instinctive impulses too, he would never seem the fatal automaton which a *merely* instinctive animal would be.

Let us now turn to human impulses with a little more detail. All we have ascertained so far is that impulses of an originally instinctive character may exist, and yet not betray themselves by automatic fatality of conduct. But in man what impulses do exist? In the light of what has been said, it is obvious that an existing impulse may not always be superficially apparent even when its object is there. And we shall see that some impulses may be masked by causes of which we have not yet spoken.

TWO PRINCIPLES OF NON-UNIFORMITY IN INSTINCTS.

Were one devising an abstract scheme, nothing would be easier than to discover from an animal's actions just how many instincts he possessed. He would react in one way only upon each class of objects with which his life had to deal; he would react in identically the same way upon every specimen of a class; and he would react invariably during his whole life. There would be no gaps among his instincts; all would come to light without perversion or disguise. But there are no such abstract animals, and nowhere does the instinctive life display itself in such a way. Not only, as we have seen, may objects of the same class arouse reactions of opposite sorts in consequence of slight changes in the circumstances, in the individual object, or in the agent's inward condition; but two other principles of which we have not yet spoken, may come into play and produce results so striking that observers as eminent as Messrs. D. A. Spalding and Romanes do not hesitate to call them 'derangements of the mental constitution,' and to conclude that the instinctive machinery has got out of gear.

These principles are those

1. Of the *inhibition of instincts by habits*; and
2. Of the *transitoriness of instincts*.

Taken in conjunction with the two former principles—that the same object may excite ambiguous impulses, or *suggest* an impulse different from that which it *excites*, by suggesting a remote object—they explain any amount of departure from uniformity of conduct, without implying any getting out of gear of the elementary impulses from which the conduct flows.

1. The law of inhibition of instincts by habits is this: *When objects of a certain class elicit from an animal a certain sort of reaction, it often happens that the animal becomes partial to the first specimen of the class on which it has reacted, and will not afterward react on any other specimen.*

The selection of a particular hole to live in, of a particular mate, of a particular feeding-ground, a particular variety of diet, a particular anything, in short, out of a possible multitude, is a very wide-spread tendency among animals, even those low down in the scale. The limpet will return to the same sticking-place in its rock, and the lobster to its favorite nook on the sea-bottom. The rabbit will deposit its dung in the same corner; the bird makes its nest on the same bough. But each of these preferences carries with it an insensibility to *other* opportunities and occasions—an insensibility which can only be described physiologically as an inhibition of new impulses by the habit of old ones already formed. The possession of homes and wives of our own makes us strangely insensible to the charms of those of other people. Few of us are adventurous in the matter of food; in fact, most of us think there is something disgusting in a bill of fare to which we are unused. Strangers, we are apt to think, cannot be worth knowing, especially if they come from distant cities, etc. The original impulse which got us homes, wives, dietaries, and friends at all, seems to exhaust itself in its first achievements and to leave no surplus energy for reacting on new cases. And so it comes about that, witnessing this torpor, an observer of mankind might say that no *instinctive* propensity toward certain objects existed at all. It existed, but it existed *miscellaneously*, or as an instinct pure and simple, only before habit was formed. A habit, once grafted on an instinctive tendency, restricts the range of the tendency itself, and keeps us from reacting on any but the habitual object, although other objects might just as well have been chosen had they been the first-comers.

Another sort of arrest of instinct by habit is where the same class of objects awakens contrary instinctive impulses. Here the impulse first followed toward a given individual of the class is apt to keep him from ever awakening the opposite impulse in us. In fact, the whole class may be protected by this individual specimen from the application to it of the other impulse. Animals, for example, awaken in a child the opposite impulses of

fearing and fondling. But if a child, in his first attempts to pat a dog, gets snapped at or bitten, so that the impulse of fear is strongly aroused, it may be that for years to come no dog will excite in him the impulse to fondle again. On the other hand, the greatest natural enemies, if carefully introduced to each other when young and guided at the outset by superior authority, settle down into those 'happy families' of friends which we see in our menageries. Young animals, immediately after birth, have no instinct of fear, but show their dependence by allowing themselves to be freely handled. Later, however, they grow 'wild,' and, if left to themselves, will not let man approach them. I am told by farmers in the Adirondack wilderness that it is a very serious matter if a cow wanders off and calves in the woods and is not found for a week or more. The calf, by that time, is as wild and almost as fleet as a deer, and hard to capture without violence. But calves rarely show any particular wildness to the men who have been in contact with them during the first days of their life, when the instinct to attach themselves is uppermost, nor do they dread strangers as they would if brought up wild.

Chickens give a curious illustration of the same law. Mr. Spalding's wonderful article on instinct shall supply us with the facts. These little creatures show opposite instincts of attachment and fear, either of which may be aroused by the same object, man. If a chick is born in the absence of the hen, it

"will follow any moving object. And, when guided by sight alone, they seem to have no more disposition to follow a hen than to follow a duck or a human being. Unreflecting lookers-on, when they saw chickens a day old running after me," says Mr. Spalding, "and older ones following me for miles, and answering to my whistle, imagined that I must have some occult power over the creatures: whereas I had simply allowed them to follow me from the first. There is the instinct to follow; and the ear, prior to experience, attaches them to the right object."^[365]

But if a man presents himself for the first time when the instinct of *fear* is strong, the phenomena are altogether reversed. Mr. Spalding kept three chickens hooded until they were nearly four days old, and thus describes their behavior:

"Each of them, on being unhooded, evinced the greatest terror to me, dashing off in the opposite direction whenever I sought to approach it. The table on which they were unhooded stood before a window, and each in its turn beat against the window like a wild bird. One of them darted behind some books, and, squeezing itself into a corner, remained cowering for a length of time. We might guess at the meaning of this strange and exceptional wildness; but the odd fact is enough for my present purpose. Whatever might have been the meaning of this marked change in their mental constitution—had they been unhooded on the previous day they would have run to me instead of from me—it could not have been the effect of experience; it must have resulted wholly from changes in their own organizations."^[366]

Their case was precisely analogous to that of the Adirondack calves. The two opposite instincts relative to the same object ripen in succession. If the first one engenders a habit, that habit will inhibit the application of the second instinct to that object. All animals are tame during the earliest phase of their infancy. Habits formed then limit the effects of whatever instincts of wildness may later be evolved.

Mr. Romanes gives some very curious examples of the way in which instinctive tendencies may be altered by the habits to which their first 'objects' have given rise. The cases are a little more complicated than those mentioned in the text, inasmuch as the object reacted on not only starts a habit which inhibits other kinds of impulse toward it (although such other kinds might be natural), but even modifies by its own peculiar conduct the constitution of the impulse which it actually awakens.

Two of the instances in question are those of hens who hatched out broods of chicks after having (in three previous years) hatched ducks. They strove to coax or to compel their new progeny to enter the water, and seemed much perplexed at their unwillingness. Another hen adopted a brood of young ferrets which, having lost their mother, were put under her. During all the time they were left with her she had to sit on the nest, for they could not wander like young chicks. She obeyed their hoarse growling as she would have obeyed her chickens' peep. She combed out their hair with her bill, and "used frequently to stop and look with one eye at the wriggling nestful, with an inquiring gaze, expressive of astonishment." At other times

she would fly up with a loud scream, doubtless because the orphans had nipped her in their search for teats. Finally, a Brahma hen nursed a young peacock during the enormous period of *eighteen months*, and never laid any eggs during all this time. The abnormal degree of pride which she showed in her wonderful chicken is described by Dr. Romanes as ludicrous.^[367]

2. This leads us to the *law of transitoriness*, which is this: *Many instincts ripen at a certain age and then fade away*. A consequence of this law is that if, during the time of such an instinct's vivacity, objects adequate to arouse it are met with, a *habit* of acting on them is formed, which remains when the original instinct has passed away; but that if no such objects are met with, then no habit will be formed; and, later on in life, when the animal meets the objects, he will altogether fail to react, as at the earlier epoch he would instinctively have done.

No doubt such a law is restricted. Some instincts are far less transient than others—those connected with feeding and 'self-preservation' may hardly be transient at all, and some, after fading out for a time, recur as strong as ever, e.g., the instincts of pairing and rearing young. The law, however, though not absolute, is certainly very widespread, and a few examples will illustrate just what it means.

In the chickens and calves above mentioned, it is obvious that the instinct to follow and become attached fades out after a few days, and that the instinct of flight then takes its place, the conduct of the creature toward man being decided by the formation or non-formation of a certain habit during those days. The transiency of the chicken's instinct to follow is also proved by its conduct toward the hen. Mr. Spalding kept some chickens shut up till they were comparatively old, and, speaking of these, he says:

"A chicken that has not heard the call of the mother till until eight or ten days old then hears it as if it heard it not. I regret to find that on this point my notes are not so full as I could wish, or as they might have been. There is, however, an account of one chicken that could not be returned to the mother when ten days old. The hen followed it, and tried to entice it in every way; still, it continually left her and ran to the house or to any person of whom it caught sight. This it persisted in doing, though beaten back with a small branch dozens of times, and,

indeed, cruelly maltreated. It was also placed under the mother at night, but it again left her in the morning."

The instinct of sucking is ripe in all mammals at birth, and leads to that habit of taking the breast which, in the human infant, may be prolonged by daily exercise long beyond its usual term of a year or a year and a half. But the instinct itself is transient, in the sense that if, for any reason, the child be fed by spoon during the first few days of its life and not put to the breast, it may be no easy matter after that to make it suck at all. So of calves. If their mother die, or be dry, or refuse to let them suck for a day or two, so that they are fed by hand, it becomes hard to get them to suck at all when a new nurse is provided. The ease with which sucking creatures are weaned, by simply breaking the habit and giving them food in a new way, shows that the instinct, purely as such, must be entirely extinct.

Assuredly the simple fact that instincts are transient, and that the effect of later ones may be altered by the habits which earlier ones have left behind, is a far more philosophical explanation than the notion of an instinctive constitution vaguely 'deranged' or 'thrown out of gear.'

I have observed a Scotch terrier, born on the floor of a stable in December, and transferred six weeks later to a carpeted house, make, when he was less than four months old, a very elaborate pretence of burying things, such as gloves, etc., with which he had played till he was tired. He scratched the carpet with his forefeet, dropped the object from his mouth upon the spot, and then scratched all about it (with both fore-and hind-feet, if I remember rightly), and finally went away and let it lie. Of course, the act was entirely useless. I saw him perform it at that age, some four or five times, and never again in his life. The conditions were not present to fix a habit which should last when the prompting instinct died away. But suppose meat instead of a glove, earth instead of a carpet, hunger-pangs instead of a fresh supper a few hours later, and it is easy to see how this dog might have got into a habit of burying superfluous food, which might have lasted all his life. Who can swear that the strictly instructive part of the food-burying propensity in the wild *Canidæ* may not be as short-lived as it was in this terrier?

A similar instance is given by Dr. H. D. Schmidt^[368] of New Orleans:

"I may cite the example of a young squirrel which I had tamed, a number of years ago, when serving in the army, and when I had sufficient leisure and opportunity to study the habits of animals. In the autumn, before the winter sets in, adult squirrels bury as many nuts as they can collect, separately, in the ground. Holding the nut firmly between their teeth, they first scratch a hole in the ground, and, after pointing their ears in all directions to convince themselves that no enemy is near, they ram—the head, with the nut still between the front teeth, serving as a sledge-hammer—the nut into the ground, and then fill up the hole by means of their paws. The whole process is executed with great rapidity, and, as it appeared to me, always with exactly the same movements; in fact, it is done so well that I could never discover the traces of the burial-ground. Now, as regards the young squirrel, which, of course, never had been present at the burial of a nut, I observed that, after having eaten a number of hickory-nuts to appease its appetite, it would take one between its teeth, then sit upright and listen in all directions. Finding all right, it would scratch upon the smooth blanket on which I was playing with it as if to make a hole, then hammer with the nut between its teeth upon the blanket, and finally perform all the motions required to fill up a hole—*in the air*; after which it would jump away, leaving the nut, of course, uncovered."

The anecdote, of course, illustrates beautifully the close relation of instinct to reflex action—a particular perception calls forth particular movements, and that is all. Dr. Schmidt writes me that the squirrel in question soon passed away from his observation. It may fairly be presumed that, if he had been long retained prisoner in a cage, he would soon have forgotten his gesticulations over the hickory-nuts.

One might, indeed, go still further with safety, and expect that, if such a captive squirrel were then set free, he would never afterwards acquire this peculiar instinct of his tribe.^[369]

Leaving lower animals aside, and turning to human instincts, we see the law of transiency corroborated on the widest scale by the alternation of different interests and passions as human life goes on. With the child, life is all play and fairy-tales and learning the external properties of 'things;' with the youth, it is bodily exercises of a more systematic sort, novels of the real world, boon-fellowship and song, friendship and love, nature, travel and adventure, science and philosophy; with the man, ambition and policy, acquisitiveness, responsibility to others, and the selfish zest of the battle of life. If a boy grows up alone at the age of games and sports, and learns neither to play ball, nor row, nor sail, nor ride, nor skate, nor fish, nor shoot, probably he will be sedentary to the end of his days; and, though the best of opportunities be afforded him for learning these things later, it is a hundred to one but he will pass them by and shrink back from the effort of taking those necessary first steps the prospect of which, at an earlier age, would have filled him with eager delight. The sexual passion expires after a protracted reign; but it is well known that its peculiar manifestations in a given individual depend almost entirely on the habits he may form during the early period of its activity. Exposure to bad company then makes him a loose liver all his days; chastity kept at first makes the same easy later on. In all pedagogy the great thing is to strike the iron while hot, and to seize the wave of the pupil's interest in each successive subject before its ebb has come, so that knowledge may be got and a habit of skill acquired—a headway of interest, in short, secured, on which afterward the individual may float. There is a happy moment for fixing skill in drawing, for making boys collectors in natural history, and presently dissectors and botanists; then for initiating them into the harmonies of mechanics and the wonders of physical and chemical law. Later, introspective psychology and the metaphysical and religious mysteries take their turn; and, last of all, the drama of human affairs and worldly wisdom in the widest sense of the term. In each of us a saturation-point is soon reached in all these things; the impetus of our purely intellectual zeal expires, and unless the topic be one associated with some urgent personal need that keens our wits constantly whetted about it, we settle into an equilibrium, and live on what we learned when our interest was fresh and instinctive, without adding to the store. Outside of their own business, the ideas gained by men before they are twenty-five are practically the only ideas they shall have in their lives. They *cannot* get anything new. Disinterested curiosity is past, the mental grooves

and channels set, the power of assimilation gone. If by chance we ever do learn anything about some entirely new topic we are afflicted with a strange sense of insecurity, and we fear to advance a resolute opinion. But, with things learned in the plastic days of instinctive curiosity we never lose entirely our sense of being at home. There remains a kinship, a sentiment of intimate acquaintance, which, even when we know we have failed to keep abreast of the subject, flatters us with a sense of power over it, and makes us feel not altogether out of the pale.

Whatever individual exceptions might be cited to this are of the sort that 'prove the rule.'

To detect the moment of the instinctive readiness for the subject is, then, the first duty of every educator. As for the pupils, it would probably lead to a more earnest temper on the part of college students if they had less belief in their unlimited future intellectual potentialities, and could be brought to realize that whatever physics and political economy and philosophy they are now acquiring are, for better or worse, the physics and political economy and philosophy that will have to serve them to the end.

The natural conclusion to draw from this transiency of instincts is that *most instincts are implanted for the sake of giving rise to habits, and that, this purpose once accomplished, the instincts themselves, as such, have no raison d'être in the psychical economy, and consequently fade away.* That occasionally an instinct should fade before circumstances permit of a habit being formed, or that, if the habit be formed, other factors than the pure instinct should modify its course, need not surprise us. Life is full of the imperfect adjustment to individual cases, of arrangements which, taking the species as a whole, are quite orderly and regular. Instinct cannot be expected to escape this general risk.

SPECIAL HUMAN INSTINCTS.

Let us now test our principles by turning to human instincts in more detail. We cannot pretend in these pages to be minute or exhaustive. But we can say enough to set all the above generalities in a more favorable light. But first, what kind of motor reactions upon objects shall we count as instincts? This, as aforesaid, is a somewhat arbitrary matter. Some of the actions

aroused in us by objects go no further than our own bodies. Such is the bristling up of the attention when a novel object is perceived, or the 'expression' on the face or the breathing apparatus of an emotion it may excite. These movements merge into ordinary reflex actions like laughing when tickled, or making a wry face at a bad taste. Other actions take effect upon the outer world. Such are flight from a wild beast, imitation of what we see a comrade do, etc. On the whole it is best to be catholic, since it is very hard to draw an exact line; and call both of these kinds of activity instinctive, so far as either may be *naturally* provoked by the presence of specific sorts of outward fact.

Professor Preyer, in his careful little work, 'Die Seele des Kindes,' says "instinctive acts are in man few in number, and, apart from those connected with the sexual passion, difficult to recognize after early youth is past." And he adds, "so much the more attention should we pay to the instinctive movements of new-born babies, sucklings, and small children." That instinctive acts should be easiest *recognized* in childhood would be a very natural effect of our principles of transitoriness, and of the restrictive influence of habits once acquired; but we shall see how far they are from being 'few in number' in man. Professor Preyer divides the movements of infants into *impulsive*, *reflex*, and instinctive. By impulsive movements he means *random* movements of limbs, body, and voice, with no aim, and before perception is aroused. Among the first reflex movements are crying on contact with the air, *sneezing*, *snuffling*, *snoring*, *coughing*, *sighing*, *sobbing*, *gagging*, *vomiting*, *hiccuping*, *starting*, *moving the limbs when tickled*, *touched*, *or blown upon*, etc., etc.

Of the movements called by him instinctive in the child, Professor Preyer gives a full account. Herr Schneider does the same; and as their descriptions agree with each other and with what other writers about infancy say, I will base my own very brief statement on theirs.

Sucking: almost perfect at birth; not coupled with any congenital tendency to *seek* the breast, this being a later acquisition. As we have seen, sucking is a transitory instinct.

Biting an object placed in the mouth, *chewing* and *grinding the teeth*; *licking* sugar; making characteristic *grimaces* over bitter and sweet tastes; *spitting* out.

Clasping an object which touches the fingers or toes. Later, attempts to *grasp* at an object seen at a distance. *Pointing at* such objects, and making a peculiar *sound expressive of desire*, which, in my own three children, was the first manifestation of speech, occurring many weeks before other significant sounds.

Carrying to the mouth of the object, when grasped. This instinct, guided and inhibited by the sense of taste, and combined with the instincts of biting, chewing, sucking, spitting-out, etc., and with the reflex act of swallowing, leads in the individual to a set of habits which constitute his *function of alimentation*, and which may or may not be gradually modified as life goes on.

Crying at bodily discomfort, hunger, or pain, and at solitude. *Smiling* at being noticed, fondled, or smiled at by others. It seems very doubtful whether young infants have any instinctive fear of a terrible or scowling face. I have been unable to make my own children, under a year old, change their expression when I changed mine; at most they manifested attention or curiosity. Preyer instances a *protrusion of the lips*, which, he says, may be so great as to remind one of that in the chimpanzee, as an instinctive expression of concentrated attention in the human infant.

Turning the head aside as a gesture of rejection, a gesture usually accompanied with a frown and a bending back of the body, and with holding the breath.

Holding head erect.

Sitting up.

Standing.

Locomotion. The early movements of children's limbs are more or less symmetrical. Later a baby will move his legs in alternation if suspended in the air. But until the impulse to walk awakens by the natural ripening of the nerve-centres, it seems to make no difference how often the child's feet may be placed in contact with the ground; the legs remain limp, and do not respond to the sensation of contact in the soles by muscular contractions *pressing downwards*. No sooner, however, is the standing impulse born, than the child stiffens his legs and presses downward as soon as he feels the floor. In some babies this is the first locomotory reaction. In others it is

preceded by the instinct to *creep*, which arises, as I can testify, often in a very sudden way. Yesterday the baby sat quite contentedly wherever he was put; to-day it has become impossible to keep him sitting at all, so irresistible is the impulse, aroused by the sight of the floor, to throw himself forward upon his hands. Usually the arms are too weak, and the ambitious little experimenter falls on his nose. But his perseverance is dauntless, and he ends in a few days by learning to travel rapidly around the room in the quadrupedal way. The position of the legs in 'creeping' varies much from one child to another. My own child, when creeping, was often observed to pick up objects from the floor with his mouth, a phenomenon which, as Dr. O. W. Holmes has remarked, like the early tendency to grasp with the toes, easily lends itself to interpretation as a reminiscence of prehuman ancestral habits.

The walking instinct may awaken with no less suddenness, and its entire education be completed within a week's compass, barring, of course, a little 'grogginess' in the gait. Individual infants vary enormously; but on the whole it is safe to say that the mode of development of these locomotor instincts is inconsistent with the account given by the older English associationist school, of their being results of the individual's education, due altogether to the gradual association of certain perceptions with certain haphazard movements and certain resultant pleasures. Mr. Bain has tried, [370] by describing the demeanor of new-born lambs, to show that locomotion is *learned* by a very rapid experience. But the observation recorded proves the faculty to be almost perfect from the first; and all others who have observed new-born calves, lambs, and pigs agree that in these animals the powers of standing and walking, and of interpreting the topographical significance of sights and sounds, are all but fully developed at birth. Often in animals who seem to be 'learning' to walk or fly the semblance is illusive. The awkwardness shown is not due to the fact that 'experience' has not yet been there to associate the successful movements and exclude the failures, but to the fact that the animal is beginning his attempts before the co-ordinating centres have quite ripened for their work. Mr. Spalding's observations on this point are conclusive as to birds.

"Birds," he says, "do not *learn* to fly. Two years ago I shut up five unfledged swallows in a small box, not much larger than the nest from which they were taken. The little box, which had a wire front, was

hung on the wall near the nest, and the young swallows were fed by their parents through the wires. In this confinement, where they could not even extend their wings, they were kept until after they were fully fledged.... On going to set the prisoners free, one was found dead.... The remaining four were allowed to escape one at a time. Two of these were perceptibly wavering and unsteady in their flight. One of them, after a flight of some ninety yards, disappeared among some trees." No. 3 and No. 4 "never flew against anything, nor was there, in their avoiding objects, any appreciable difference between them and the old birds. No. 3 swept round the Wellingtonia, and No. 4 rose over the hedge, just as we see the old swallows doing every hour of the day. I have this summer verified these observations. Of two swallows I had similarly confined, one, on being set free, flew a yard or two close to the ground, rose in the direction of a beech-tree, which it gracefully avoided; it was seen for a considerable time sweeping round the beeches and performing magnificent evolutions in the air high above them. The other, which was observed to beat the air with its wings more than usual, was soon lost to sight, behind some trees. Titmice, tomtits, and wrens I have made the subjects of similar observations, and with similar results."^[371]

In the light of this report, one may well be tempted to make a prediction about the human child, and say that if a baby were kept from getting on his feet for two or three weeks after the first impulse to walk had shown itself in him,—a small blister on each sole would do the business,—he might then be expected to walk about as well, through the mere ripening of his nerve-centres, as if the ordinary process of 'learning' had been allowed to occur during all the blistered time. It is to be hoped that some scientific widower, left alone with his offspring at the critical moment, may ere long test this suggestion on the living subject. *Climbing* on trees, fences, furniture, banisters, etc., is a well-marked instinctive propensity which ripens after the fourth year.

Vocalization. This may be either musical or significant. Very few weeks after birth the baby begins to express its spirits by emitting vowel sounds, as much during inspiration as during expiration, and will lie on its back cooing and gurgling to itself for nearly an hour. But this singing has nothing to do with speech. Speech is sound *significant*. During the second year a

certain number of significant sounds are gradually acquired; but talking proper does not set in till the instinct to *imitate sounds* ripens in the nervous system; and this ripening seems in some children to be quite abrupt. Then speech grows rapidly in extent and perfection. The child imitates every word he hears uttered, and repeats it again and again with the most evident pleasure at his new power. At this time it is quite impossible to talk *with* him, for his condition is that of 'Echolalia,'—instead of answering the question, he simply reiterates it. The result is, however, that his vocabulary increases very fast; and little by little, with teaching from above, the young prattler understands, puts words together to express his own wants and perceptions, and even makes intelligent replies. From a speechless, he has become a speaking, animal. The interesting point with regard to this instinct is the oftentimes very sudden birth of the impulse to imitate sounds. Up to the date of its awakening the child may have been as devoid of it as a dog. Four days later his whole energy may be poured into this new channel. The habits of articulation formed during the plastic age of childhood are in most persons sufficient to inhibit the formation of new ones of a fundamentally different sort—witness the inevitable 'foreign accent' which distinguishes the speech of those who learn a language after early youth.

Imitation. The child's first words are in part vocables of his own invention, which his parents adopt, and which, as far as they go, form a new human tongue upon the earth; and in part they are his more or less successful imitations of words he hears the parents use. But the instinct of *imitating gestures* develops earlier than that of imitating sounds,—unless the sympathetic crying of a baby when it hears another cry may be reckoned as imitation of a sound. Professor Preyer speaks of his child imitating the protrusion of the father's lips in its fifteenth week. The various accomplishments of infancy, making 'pat-a-cake,' saying 'bye-bye,' 'blowing out the candle,' etc., usually fall well inside the limits of the first year. Later come all the various imitative games in which childhood revels, playing 'horse,' 'soldiers,' etc., etc. And from this time onward man is essentially *the* imitative animal. His whole educability and in fact the whole history of civilization depend on this trait, which his strong tendencies to rivalry, jealousy, and acquisitiveness reinforce. '*Humani nihil a me alienum puto,*' is the motto of each individual of the species; and makes him, whenever another individual shows a power or superiority of any kind, restless until he can exhibit it himself. But apart from this kind of imitation, of which the

psychological roots are complex, there is the more direct propensity to speak and walk and behave like others, usually without any conscious intention of so doing. And there is the imitative tendency which shows itself in large masses of men, and produces panics, and orgies, and frenzies of violence, and which only the rarest individuals can actively withstand. This sort of imitativeness is possessed by man in common with other gregarious animals, and is an instinct in the fullest sense of the term, being a blind impulse to act as soon as a certain perception occurs. It is particularly hard not to imitate gaping, laughing, or looking and running in a certain direction, if we see others doing so. Certain mesmerized subjects must automatically imitate whatever motion their operator makes before their eyes.^[372] A successful piece of mimicry gives to both bystanders and mimic a peculiar kind of æsthetic pleasure. The dramatic impulse, the tendency to pretend one is someone else, contains this pleasure of mimicry as one of its elements. Another element seems to be a peculiar sense of power in stretching one's own personality so as to include that of a strange person. In young children this instinct often knows no bounds. For a few months in one of my children's third year, he literally hardly ever appeared in his own person. It was always, "Play I am So-and-so, and you are So-and-so, and the chair is such a thing, and then we'll do this or that." If you called him by his name, H., you invariably got the reply, "I'm not H., I'm a hyena, or a horse-car," or whatever the feigned object might be. He outwore this impulse after a time; but while it lasted, it had every appearance of being the automatic result of ideas, often suggested by perceptions, working out irresistible motor effects. Imitation shades into

Emulation or Rivalry, a very intense instinct, especially rife with young children, or at least especially undisguised. Everyone knows it. Nine-tenths of the work of the world is done by it. We know that if we do not do the task someone else will do it and get the credit, so we do it. It has very little connection with sympathy, but rather more with pugnacity, which we proceed in turn to consider.

Pugnacity; anger; resentment. In many respects man is the most ruthlessly ferocious of beasts. As with all gregarious animals, 'two souls,' as Faust says, 'dwell within his breast,' the one of sociability and helpfulness, the other of jealousy and antagonism to his mates. Though in a general way he cannot live without them, yet, as regards certain individuals, it often falls

out that he cannot live with them either. Constrained to be a member of a tribe, he still has a right to decide, as far as in him lies, of which other members the tribe shall consist. Killing off a few obnoxious ones may often better the chances of those that remain. And killing off a neighboring tribe from whom no good thing comes, but only competition, may materially better the lot of the whole tribe. Hence the gory cradle, the *bellum omnium contra omnes*, in which our race was reared; hence the fickleness of human ties, the ease with which the foe of yesterday becomes the ally of to-day, the friend of to-day the enemy of to-morrow; hence the fact that we, the lineal representatives of the successful enactors of one scene of slaughter after another, must, whatever more pacific virtues we may also possess, still carry about with us, ready at any moment to burst into flame, the smouldering and sinister traits of character by means of which they lived through so many massacres, harming others, but themselves unharmed.

Sympathy is an emotion as to whose instinctiveness psychologists have held hot debate, some of them contending that it is no primitive endowment, but, originally at least, the result of a rapid calculation of the good consequences to ourselves of the sympathetic act. Such a calculation, at first conscious, would grow more unconscious as it became more habitual, and at last, tradition and association aiding, might prompt to actions which could not be distinguished from immediate impulses. It is hardly needful to argue against the falsity of this view. Some forms of sympathy, that of mother with child, for example, are surely primitive, and not intelligent forecasts of board and lodging and other support to be reaped in old age. Danger to the child blindly and instantaneously stimulates the mother to actions of alarm or defence. Menace or harm to the adult beloved or friend excites us in a corresponding way, often against all the dictates of prudence. It is true that sympathy does not necessarily follow from the mere fact of gregariousness. Cattle do not help a wounded comrade; on the contrary, they are more likely to dispatch him. But a dog will lick another sick dog, and even bring him food; and the sympathy of monkeys is proved by many observations to be strong. In man, then, we may lay it down that the sight of suffering or danger to others is a direct exciter of interest, and an immediate stimulus, if no complication hinders, to acts of relief. There is nothing unaccountable or pathological about this—nothing to justify Professor Bain's assimilation of it to the 'fixed ideas' of insanity, as 'clashing with the regular outgoings of the will.' It may be as primitive as any other 'outgoing,' and may be due to a

random variation selected, quite as probably as gregariousness and maternal love are, even in Spencer's opinion, due to such variations.

It is true that sympathy is peculiarly liable to inhibition from other instincts which its stimulus may call forth. The traveller whom the good Samaritan rescued may well have prompted such instinctive fear or disgust in the priest and Levite who passed him by, that their sympathy could not come to the front. Then, of course, habits, reasoned reflections, and calculations may either check or reinforce one's sympathy; as may also the instincts of love or hate, if these exist, for the suffering individual. The hunting and pugnacious instincts, when aroused, also inhibit our sympathy absolutely. This accounts for the cruelty of collections of men hounding each other on to bait or torture a victim. The blood mounts to the eyes, and sympathy's chance is gone.^[373]

The hunting instinct has an equally remote origin in the evolution of the race.^[374] The hunting and the fighting instinct combine in many manifestations. They both support the emotion of anger; they combine in the fascination which stories of atrocity have for most minds; and the utterly blind excitement of giving the rein to our fury when our blood is up (an excitement whose intensity is greater than that of any other human passion save one) is only explicable as an impulse aboriginal in character, and having more to do with immediate and overwhelming tendencies to muscular discharge than to any possible reminiscences of effects of experience, or association of ideas. I say this here, because the pleasure of disinterested cruelty has been thought a paradox, and writers have sought to show that it is no primitive attribute of our nature, but rather a resultant of the subtle combination of other less malignant elements of mind. This is a hopeless task. If evolution and the survival of the fittest be true at all, the destruction of prey and of human rivals *must* have been among the most important of man's primitive functions, the fighting and the chasing instincts *must* have become ingrained. Certain perceptions *must* immediately, and without the intervention of inferences and ideas, have prompted emotions and motor discharges; and both the latter must, from the nature of the case, have been very violent, and therefore, when unchecked, of an intensely pleasurable kind. It is just because human bloodthirstiness is such a primitive part of us that it is so hard to eradicate, especially where a fight or a hunt is promised as part of the fun.^[375]

As Rochefoucauld says, there is something in the misfortunes of our very friends that does not altogether displease us; and an apostle of peace will feel a certain vicious thrill run through him, and enjoy a vicarious brutality, as he turns to the column in his newspaper at the top of which 'Shocking Atrocity' stands printed in large capitals. See how the crowd flocks round a street-brawl! Consider the enormous annual sale of revolvers to persons, not one in a thousand of whom has any serious intention of using them, but of whom each one has his carnivorous self-consciousness agreeably tickled by the notion, as he clutches the handle of his weapon, that he will be rather a dangerous customer to meet. See the ignoble crew that escorts every great pugilist—parasites who feel as if the glory of his brutality rubbed off upon them, and whose darling hope, from day to day, is to arrange some set-to of which they may share the rapture without enduring the pains! The first blows at a prize-fight are apt to make a refined spectator sick; but his blood is soon up in favor of one party, and it will then seem as if the other fellow could not be banged and pounded and mangled enough—the refined spectator would like to reinforce the blows himself. Over the sinister orgies of blood of certain depraved and insane persons let a curtain be drawn, as well as over the ferocity with which otherwise fairly decent men may be animated, when (at the sacking of a town, for instance), the excitement of victory long delayed, the sudden freedom of rapine and of lust, the contagion of a crowd, and the impulse to imitate and outdo, all combine to swell the blind drunkenness of the killing-instinct, and carry it to its extreme. No! those who try to account for this from above downwards, as if it resulted from the consequences of the victory being rapidly inferred, and from the agreeable sentiments associated with them in the imagination, have missed the root of the matter. Our ferocity is blind, and can only be explained from *below*. Could we trace it back through our line of descent, we should see it taking more and more the form of a fatal reflex response, and at the same time becoming more and more the pure and direct emotion that it is.^[376]

In childhood it takes this form. The boys who pull out grasshoppers' legs and butterflies' wings, and disembowel every frog they catch, have no *thought* at all about the matter. The creatures tempt their hands to a fascinating occupation, to which they have to yield. It is with them as with the 'boy-fiend' Jesse Pomeroy, who cut a little girl's throat, 'just to see how she'd act.' The normal provocatives of the impulse are all living beasts,

great and small, toward which a contrary habit has not been formed—all human beings in whom we perceive a certain *intent* towards *us*, and a large number of human beings who offend us peremptorily, either by their look, or gait, or by some circumstance in their lives which we dislike. Inhibited by sympathy, and by reflection calling up impulses of an opposite kind, civilized men lose the habit of acting out their pugnacious instincts in a perfectly natural way, and a passing feeling of anger, with its comparatively faint bodily expressions, may be the limit of their physical combativeness. Such a feeling as this may, however, be aroused by a wide range of objects. Inanimate things, combinations of color and sound, bad bills of fare, may in persons who combine fastidious taste with an irascible temperament produce real ebullitions of rage. Though the female sex is often said to have less pugnacity than the male, the difference seems connected more with the extent of the motor consequences of the impulse than with its frequency. Women take offence and get angry, if anything, more easily than men, but their anger is inhibited by fear and other principles of their nature from expressing itself in blows. The hunting-instinct proper seems to be decidedly weaker in them than in men. The latter instinct is easily restricted by habit to certain objects, which become legitimate 'game,' while other things are spared. If the hunting-instinct be not exercised at all, it may even entirely die out, and a man may enjoy letting a wild creature live, even though he might easily kill it. Such a type is now becoming frequent; but there is no doubt that in the eyes of a child of nature such a personage would seem a sort of moral monster.

Fear is a reaction aroused by the same objects that arouse ferocity. The antagonism of the two is an interesting study in instinctive dynamics. We both fear, and wish to kill, anything that may kill us; and the question which of the two impulses we shall follow is usually decided by some one of those *collateral circumstances* of the particular case, to be moved by which is the mark of superior mental natures. Of course this introduces uncertainty into the reaction; but it is an uncertainty found in the higher brutes as well as in men, and ought not to be taken as proof that we are less instinctive than they. Fear has bodily expressions of an extremely energetic kind, and stands, beside lust and anger, as one of the three most exciting emotions of which our nature is susceptible. The progress from brute to man is characterized by nothing so much as by the decrease in frequency of proper occasions for fear. In civilized life, in particular, it has at last become possible for large numbers of people to pass from the cradle to the grave without ever having had a pang of genuine fear. Many of us need an attack of mental disease to teach us the meaning of the word. Hence the possibility of so much blindly optimistic philosophy and religion. The atrocities of life become 'like a tale of little meaning though the words are strong;' we doubt if anything like *us* ever really was within the tiger's jaws, and conclude that the horrors we hear of are but a sort of painted tapestry for the chambers in which we lie so comfortably at peace with ourselves and with the world.

Be this as it may, fear is a genuine instinct, and one of the earliest shown by the human child. *Noises* seem especially to call it forth. Most noises from the outer world, to a child bred in the house, have no exact significance. They are simply startling. To quote a good observer, M. Perez:

"Children between three and ten months are less often alarmed by visual than by auditory impressions. In cats, from the fifteenth day, the contrary is the case. A child, three and a half months old, in the midst of the turmoil of a conflagration, in presence of the devouring flames and ruined walls, showed neither astonishment nor fear, but smiled at the woman who was taking care of him, while his parents were busy. The noise, however, of the trumpet of the firemen, who were approaching, and that of the wheels of the engine, made him start and cry. At this age I have never yet seen an infant startled at a flash of lightning, even when intense; but I have seen many of them alarmed at

the voice of the thunder.... Thus fear comes rather by the ears than by the eyes, to the child without experience. It is natural that this should be reversed, or reduced, in animals organized to perceive danger afar. Accordingly, although I have never seen a child frightened at his first sight of fire, I have many a time seen young dogs, young cats, young chickens, and young birds frightened thereby.... I picked up some years ago a lost cat about a year old. Some months afterward at the onset of cold weather I lit the fire in the grate of my study, which was her reception-room. She first looked at the flame in a very frightened way. I brought her near to it. She leaped away and ran to hide under the bed. Although the fire was lighted every day, it was not until the end of the winter that I could prevail upon her to stay upon a chair near it. The next winter, however, all apprehension had disappeared.... Let us, then, conclude that there are hereditary dispositions to fear, which are independent of experience, but which experiences may end by attenuating very considerably. In the human infant I believe them to be particularly connected with the ear."^[377]

The effect of noise in heightening any terror we may feel in adult years is very marked. The *howling* of the storm, whether on sea or land, is a principal cause of our anxiety when exposed to it. The writer has been interested in noticing in his own person, while lying in bed, and kept awake by the wind outside, how invariably each loud gust of it arrested momentarily his heart. A dog, attacking us, is much more dreadful by reason of the noises he makes.

Strange men, and *strange animals*, either large or small, excite fear, but especially men or animals advancing toward us in a threatening way. This is entirely instinctive and antecedent to experience. Some children will cry with terror at their very first sight of a cat or dog, and it will often be impossible for weeks to make them touch it. Others will wish to fondle it almost immediately. Certain kinds of 'vermin,' especially spiders and snakes, seem to excite a fear unusually difficult to overcome. It is impossible to say how much of this difference is instinctive and how much the result of stories heard about these creatures. That the fear of 'vermin' ripens gradually, seemed to me to be proved in a child of my own to whom I gave a live frog once, at the age of six to eight months, and again when he was a year and a half old. The first time he seized it promptly, and holding

it, in spite of its struggling, at last got its head into his mouth. He then let it crawl up his breast, and get upon his face, without showing alarm. But the second time, although he had seen no frog and heard no story about a frog between whiles, it was almost impossible to induce him to touch it. Another child, a year old, eagerly took some very large spiders into his hand. At present he is afraid, but has been exposed meanwhile to the teachings of the nursery. One of my children from her birth upwards saw daily the pet pug-dog of the house, and never betrayed the slightest fear until she was (if I recollect rightly) about eight months old. Then the instinct suddenly seemed to develop, and with such intensity that familiarity had no mitigating effect. She screamed whenever the dog entered the room, and for many months remained afraid to touch him. It is needless to say that no change in the pug's unfailingly friendly conduct had anything to do with this change of feeling in the child.

Preyer tells of a young child screaming with fear on being carried near to the *sea*. The great source of terror to infancy is solitude. The teleology of this is obvious, as is also that of the infant's expression of dismay—the never-failing cry—on waking up and finding himself alone.

Black things, and especially *dark places*, holes, caverns, etc., arouse a peculiarly gruesome fear. This fear, as well as that of solitude, of being 'lost,' are explained after a fashion by ancestral experience. Says Schneider:

"It is a fact that men, especially in childhood, fear to go into a dark cavern or a gloomy wood. This feeling of fear arises, to be sure, partly from the fact that we easily suspect that dangerous beasts may lurk in these localities—a suspicion due to stories we have heard and read. But, on the other hand, it is quite sure that this fear at a certain perception is also directly inherited. Children who have been carefully guarded from all ghost-stories are nevertheless terrified and cry if led into a dark place, especially if sounds are made there. Even an adult can easily observe that an uncomfortable timidity steals over him in a lonely wood at night, although he may have the fixed conviction that not the slightest danger is near.

"This feeling of fear occurs in many men even in their own house after dark, although it is much stronger in a dark cavern or forest. The fact of such instinctive fear is easily explicable when we consider that our

savage ancestors through innumerable generations were accustomed to meet with dangerous beasts in caverns, especially bears, and were for the most part attacked by such beasts during the night and in the woods, and that thus an inseparable association between the perceptions of darkness of caverns and woods, and fear took place, and was inherited."^[378]

High places cause fear of a peculiarly sickening sort, though here, again, individuals differ enormously. The utterly blind instinctive character of the motor impulses here is shown by the fact that they are almost always entirely unreasonable, but that reason is powerless to suppress them. That they are a mere incidental peculiarity of the nervous system, like liability to sea-sickness, or love of music, with no teleological significance, seems more than probable. The fear in question varies so much from one person to another, and its detrimental effects are so much more obvious than its uses, that it is hard to see how it could be a selected instinct. Man is anatomically one of the best fitted of animals for climbing about high places. The best psychical complement to this equipment would seem to be a 'level head' when there, not a dread of going there at all. In fact, the teleology of fear, beyond a certain point, is very dubious. Professor Mosso, in his interesting monograph, 'La Paura' (which has been translated into French), concludes that many of its manifestations must be considered pathological rather than useful; Bain, in several places, expresses the same opinion; and this, I think, is surely the view which any observer without *a priori* prejudices must take. A certain amount of timidity obviously adapts us to the world we live in, but the *fear-paroxysm* is surely altogether harmful to him who is its prey.

Fear of the supernatural is one variety of fear. It is difficult to assign any normal object for this fear, unless it were a genuine ghost. But, in spite of psychical research-societies, science has not yet adopted ghosts; so we can only say that certain *ideas* of supernatural agency, associated with real circumstances, produce a peculiar kind of horror. This horror is probably explicable as the result of a combination of simpler horrors. To bring the ghostly terror to its maximum, many usual elements of the dreadful must combine, such as loneliness, darkness, inexplicable sounds, especially of a dismal character, moving figures half discerned (or, if discerned, of dreadful aspect), and a vertiginous baffling of the expectation. This last element, which is *intellectual*, is very important. It produces a strange emotional

'curdle' in our blood to see a process with which we are familiar deliberately taking an unwonted course. Any one's heart would stop beating if he perceived his chair sliding unassisted across the floor. The lower animals appear to be sensitive to the mysteriously exceptional as well as ourselves. My friend Professor W. K. Brooks, of the Johns Hopkins University, told me of his large and noble dog being frightened into a sort of epileptic fit by a bone being drawn across the floor by a thread which the dog did not see. Darwin and Romanes have given similar experiences.^[379] The idea of the supernatural involves that the usual should be set at naught. In the witch and hobgoblin supernatural, other elements still of fear are brought in—caverns, slime and ooze, vermin, corpses, and the like.^[380] A human corpse seems normally to produce an instinctive dread, which is no doubt somewhat due to its mysteriousness, and which familiarity rapidly dispels. But, in view of the fact that cadaveric, reptilian, and underground horrors play so specific and constant a part in many nightmares and forms of delirium, it seems not altogether unwise to ask whether these forms of dreadful circumstance may not at a former period have been more normal objects of the environment than now. The ordinary cock-sure evolutionist ought to have no difficulty in explaining these terrors, and the scenery that provokes them, as relapses into the consciousness of the cave-men, a consciousness usually overlaid in us by experiences of more recent date.

There are certain other pathological fears, and certain peculiarities in the expression of ordinary fear, which might receive an explanatory light from ancestral conditions, even infra-human ones. In ordinary fear, one may either run, or remain semi-paralyzed. The latter condition reminds us of the so-called death-shamming instinct shown by many animals. Dr. Lindsay, in his work 'Mind in Animals,' says this must require great self-command in those that practise it. But it is really no feigning of death at all, and requires no self-command. It is simply a terror-paralysis which has been so useful as to become hereditary. The beast of prey does not think the motionless bird, insect, or crustacean dead. He simply fails to notice them at all; because his senses, like ours, are much more strongly excited by a moving object than by a still one. It is the same instinct which leads a boy playing 'I spy' to hold his very breath when the seeker is near, and which makes the beast of prey himself in many cases motionlessly lie in wait for his victim or silently 'stalk' it, by rapid approaches alternated with periods of immobility. It is the

opposite of the instinct which makes us jump up and down and move our arms when we wish to attract the notice of some one passing far away, and makes the shipwrecked sailor frantically wave a cloth upon the raft where he is floating when a distant sail appears. Now, may not the statue-like, crouching immobility of some melancholiacs, insane with general anxiety and fear of everything, be in some way connected with this old instinct? They can give no *reason* for their fear to move; but immobility makes them feel safer and more comfortable. Is not this the mental state of the 'feigning' animal?

Again, take the strange symptom which has been described of late years by the rather absurd name of *agoraphobia*. The patient is seized with palpitation and terror at the sight of any open place or broad street which he has to cross alone. He trembles, his knees bend, he may even faint at the idea. Where he has sufficient self-command he sometimes accomplishes the object by keeping safe under the lee of a vehicle going across, or joining himself to a knot of other people. But usually he slinks round the sides of the square, hugging the houses as closely as he can. This emotion has no utility in a civilized man, but when we notice the chronic agoraphobia of our domestic cats, and see the tenacious way in which many wild animals, especially rodents, cling to cover, and only venture on a dash across the open as a desperate measure—even then making for every stone or bunch of weeds which may give a momentary shelter—when we see this we are strongly tempted to ask whether such an odd kind of fear in us be not due to the accidental resurrection, through disease, of a sort of instinct which may in some of our ancestors have had a permanent and on the whole a useful part to play?

Appropriation or Acquisitiveness. The beginnings of acquisitiveness are seen in the impulse which very young children display, to snatch at, or beg for, any object which pleases their attention. Later, when they begin to speak, among the first words they emphasize are 'me' and 'mine.'^[381] Their earliest quarrels with each other are about questions of ownership; and parents of twins soon learn that it conduces to a quiet house to buy all presents in impartial duplicate. Of the later evolution of the proprietary instinct I need not speak. Everyone knows how difficult a thing it is not to covet whatever pleasing thing we see, and how the sweetness of the thing often is as gall to us so long as it is another's. When another is in

possession, the impulse to appropriate the thing often turns into the impulse to harm him—what is called *envy*, or *jealousy*, ensues. In civilized life the impulse to own is usually checked by a variety of considerations, and only passes over into action under circumstances legitimated by habit and common consent, an additional example of the way in which one instinctive tendency may be inhibited by others. A variety of the proprietary instinct is the impulse to form collections of the same sort of thing. It differs much in individuals, and shows in a striking way how instinct and habit interact. For, although a collection of any given thing—like postage-stamps—need not be begun by any given person, yet the chances are that if accidentally it *be* begun by a person with the collecting instinct, it will probably be continued. The chief interest of the objects, in the collector's eyes, is that they are a collection, and that they are his. Rivalry, to be sure, inflames this, as it does every other passion, yet the objects of a collector's mania need not be necessarily such as are generally in demand. Boys will collect anything that they see another boy collect, from pieces of chalk and peach-pits up to books and photographs. Out of a hundred students whom I questioned, only four or five had never collected anything.^[382]

The associationist psychology denies that there is any blind primitive instinct to appropriate, and would explain all acquisitiveness, in the first instance, as a desire to secure the 'pleasures' which the objects possessed may yield; and, secondly, as the association of the idea of pleasantness with the *holding* of the thing, even though the pleasure originally got by it was only gained through its expense or destruction. Thus the miser is shown to us as one who has transferred to the gold by which he may buy the goods of this life all the emotions which the goods themselves would yield; and who thereafter loves the gold for its own sake, preferring the means of pleasure to the pleasure itself. There can be little doubt that much of this analysis a broader view of the facts would have dispelled. 'The miser' is an abstraction. There are all kinds of misers. The common sort, the excessively niggardly man, simply exhibits the psychological law that the potential has often a far greater influence over our mind than the actual. A man will not marry now, because to do so puts an end to his indefinite potentialities of choice of a partner. He prefers the latter. He will not use open fires or wear his good clothes, because the day may come when he will have to use the furnace or dress in a worn-out coat, 'and then where will he be?' For him, better the actual evil than the fear of it; and so it is with the common lot of

misers. Better to live poor now, with the *power* of living rich, than to live rich at the risk of losing the power. These men value their gold, not for its own sake, but for its powers. Demonetize it, and see how quickly they will get rid of it! The associationist theory is, as regards them, entirely at fault: they care nothing for the gold *in se*.

With other misers there combines itself with this preference of the power over the act the far more instinctive element of the simple collecting propensity. Every one collects money, and when a man of petty ways is smitten with the collecting mania for this object he necessarily becomes a miser. Here again the associationist psychology is wholly at fault. The hoarding instinct prevails widely among animals as well as among men. Professor Silliman has thus described one of the hoards of the California wood-rat, made in an empty stove of an unoccupied house:

"I found the outside to be composed entirely of spikes, all laid with symmetry, so as to present the points of the nails outward. In the centre of this mass was the nest, composed of finely-divided fibres of hemp-packing. Interlaced with the spikes were the following: about two dozen knives, forks, and spoons; all the butcher's knives, three in number; a large carving-knife, fork, and steel; several large plugs of tobacco,... an old purse containing some silver, matches, and tobacco; nearly all the small tools from the tool-closets, with several large augers,... all of which must have been transported some distance, as they were originally stored in different parts of the house.... The outside casing of a silver watch was disposed of in one part of the pile, the glass of the same watch in another, and the works in still another."
[383]

In every lunatic asylum we find the collecting instinct developing itself in an equally absurd way. Certain patients will spend all their time picking pins from the floor and hoarding them. Others collect bits of thread, buttons, or rags, and prize them exceedingly. Now, 'the Miser' *par excellence* of the popular imagination and of melodrama, the monster of squalor and misanthropy, is simply one of these mentally deranged persons. His intellect may in many matters be clear, but his instincts, especially that of ownership, are insane, and their insanity has no more to do with the association of ideas than with the precession of the equinoxes. As a matter

of fact his hoarding usually is directed to money; but it also includes almost anything besides. Lately in a Massachusetts town there died a miser who principally hoarded newspapers. These had ended by so filling all the rooms of his good-sized house from floor to ceiling that his living-space was restricted to a few narrow channels between them. Even as I write, the morning paper gives an account of the emptying of a miser's den in Boston by the City Board of Health. What the owner hoarded is thus described:

"He gathered old newspapers, wrapping-paper, incapacitated umbrellas, canes, pieces of common wire, cast-off clothing, empty barrels, pieces of iron, old bones, battered tin-ware, fractured pots, and bushels of such miscellany as is to be found only at the city 'dump.' The empty barrels were filled, shelves were filled, every hole and corner was filled, and in order to make more storage-room, 'the hermit' covered his store-room with a network of ropes, and hung the ropes as full as they could hold of his curious collections. There was nothing one could think of that wasn't in that room. As a wood-sawyer, the old man had never thrown away a saw-blade or a wood-buck. The bucks were rheumatic and couldn't stand up, and the saw-blades were worn down to almost nothing in the middle. Some had been actually worn in two, but the ends were carefully saved and stored away. As a coal-heaver, the old man had never cast off a worn-out basket, and there were dozens of the remains of the old things, patched up with canvas and rope-yarns, in the store-room. There were at least two dozen old hats, fur, cloth, silk, and straw," etc.

Of course there may be a great many 'associations of ideas' in the miser's mind about the things he hoards. He is a thinking being, and must associate things; but, without an entirely blind impulse in this direction behind all his ideas, such practical results could never be reached.^[384]

Kleptomania, as it is called, is an uncontrollable impulse to appropriate, occurring in persons whose 'associations of ideas' would naturally all be of a counteracting sort. Kleptomaniacs often promptly restore, or permit to be restored, what they have taken; so the impulse need not be to keep, but only to take. But elsewhere hoarding complicates the result. A gentleman, with whose case I am acquainted, was discovered, after his death, to have a hoard in his barn of all sorts of articles, mainly of a trumpery sort, but

including pieces of silver which he had stolen from his own dining-room, and utensils which he had stolen from his own kitchen, and for which he had afterward bought substitutes with his own money.

Constructiveness is as genuine and irresistible an instinct in man as in the bee or the beaver. Whatever things are plastic to his hands, those things he must remodel into shapes of his own, and the result of the remodelling, however useless it may be, gives him more pleasure than the original thing. The mania of young children for breaking and pulling apart whatever is given them is more often the expression of a rudimentary constructive impulse than of a destructive one. 'Blocks' are the playthings of which they are least apt to tire. Clothes, weapons, tools, habitations, and works of art are the result of the discoveries to which the plastic instinct leads, each individual starting where his forerunners left off, and tradition preserving all that once is gained. Clothing, where not necessitated by cold, is nothing but a sort of attempt to remodel the human body itself—an attempt still better shown in the various tattooings, tooth-filings, scarrings, and other mutilations that are practised by savage tribes. As for habitation, there can be no doubt that the instinct to seek a sheltered nook, open only on one side, into which he may retire and be safe, is in man quite as specific as the instinct of birds to build a nest. It is not necessarily in the shape of a shelter from wet and cold that the need comes before him, but he feels less *exposed* and more at home when not altogether uninclosed than when lying all abroad. Of course the utilitarian origin of this instinct is obvious. But to stick to bare facts at present and not to trace origins, we must admit that this instinct now exists, and probably always has existed, since man was man. Habits of the most complicated kind are reared upon it. But even in the midst of these habits we see the blind instinct cropping out; as, for example, in the fact that we feign a shelter within a shelter, by backing up beds in rooms with their heads against the wall, and never lying in them the other way—just as dogs prefer to get under or upon some piece of furniture to sleep, instead of lying in the middle of the room. The first habitations were caves and leafy grottoes, bettered by the hands; and we see children to-day, when playing in wild places, take the greatest delight in discovering and appropriating such retreats and 'playing house' there.

Play. The impulse to play in special ways is certainly instinctive. A boy can no more help running after another boy who runs provokingly near him, than a kitten can help running after a rolling ball. A child trying to get into its own hand some object which it sees another child pick up, and the latter trying to get away with the prize, are just as much slaves of an automatic prompting as are two chickens or fishes, of which one has taken a big morsel into its mouth and decamps with it, while the other darts after in pursuit. All simple active games are attempts to gain the excitement yielded by certain primitive instincts, through feigning that the occasions for their exercise are there. They involve imitation, hunting, fighting, rivalry, acquisitiveness, and construction, combined in various ways; their special rules are habits, discovered by accident, selected by intelligence, and propagated by tradition; but unless they were founded in automatic impulses, games would lose most of their zest. The sexes differ somewhat in their play-impulses. As Schneider says:

"The little boy imitates soldiers, models clay into an oven, builds houses, makes a wagon out of chairs, rides on horseback upon a stick, drives nails with the hammer, harnesses his brethren and comrades together and plays the stage-driver, or lets himself be captured as a wild horse by some one else. The girl, on the contrary, plays with her doll, washes and dresses it, strokes it, clasps and kisses it, puts it to bed and tucks it in, sings it a cradle-song, or speaks with it as if it were a living being.... This fact that a sexual difference exists in the play-impulse, that a boy gets more pleasure from a horse and rider and a soldier than from a doll, while with the girl the opposite is the case, is proof that an hereditary connection exists between the perception of certain things (horse, doll, etc.), and the feeling of pleasure, as well as between this latter and the impulse to play."^[385]

There is another sort of human play, into which higher æsthetic feelings enter. I refer to that love of festivities, ceremonies, ordeals, etc., which seems to be universal in our species. The lowest savages have their dances, more or less formally conducted. The various religions have their solemn rites and exercises, and civic and military power symbolize their grandeur by processions and celebrations of divers sorts. We have our operas and parties and masquerades. An element common to all these ceremonial

games, as they may be called, is the excitement of concerted action as one of an organized crowd. The same acts, performed with a crowd, seem to mean vastly more than when performed alone. A walk with the people on a holiday afternoon, an excursion to drink beer or coffee at a popular 'resort,' or an ordinary ball-room, are examples of this. Not only are we amused at seeing so many strangers, but there is a distinct stimulation at feeling our share in their collective life. The perception of them is the stimulus; and our reaction upon it is our tendency to join them and do what they are doing, and our unwillingness to be the first to leave off and go home alone. This seems a primitive element in our nature, as it is difficult to trace any association of ideas that could lead up to it; although, once granting it to exist, it is very easy to see what its uses to a tribe might be in facilitating prompt and vigorous collective action. The formation of armies and the undertaking of military expeditions would be among its fruits. In the ceremonial games it is but the impulsive starting-point. What particular things the crowd then shall do, depends for the most part on the initiative of individuals, fixed by imitation and habit, and continued by tradition. The co-operation of other æsthetic pleasures with games, ceremonial or other, has a great deal to do with the selection of such as shall become stereotyped and habitual. The peculiar form of excitement called by Professor Bain the emotion of *pursuit*, the pleasure of a *crescendo*, is the soul of many common games. The immense extent of the play-activities in human life is too obvious to be more than mentioned.^[386]

Curiosity. Already pretty low down among vertebrates we find that any object may excite attention, provided it be only *novel*, and that attention may be followed by approach and exploration by nostril, lips, or touch. Curiosity and fear form a couple of antagonistic emotions liable to be awakened by the same outward thing, and manifestly both useful to their possessor. The spectacle of their alternation is often amusing enough, as in the timid approaches and scared wheelings which sheep or cattle will make in the presence of some new object they are investigating. I have seen alligators in the water act in precisely the same way towards a man seated on the beach in front of them—gradually drawing near as long as he kept

still, frantically careering back as soon as he made a movement. Inasmuch as new objects *may* always be advantageous, it is better that an animal should not *absolutely* fear them. But, inasmuch as they may also possibly be harmful, it is better that he should not be quite indifferent to them either, but on the whole remaining on the *qui vive*, ascertain as much about them, and what they may be likely to bring forth, as he can, before settling down to rest in their presence. Some such susceptibility for being excited and irritated by the mere novelty, as such, of any movable feature of the environment must form the instinctive basis of all human curiosity; though, of course, the superstructure absorbs contributions from so many other factors of the emotional life that the original root may be hard to find. With what is called scientific curiosity, and with metaphysical wonder, the practical instinctive root has probably nothing to do. The stimuli here are not objects, but ways of conceiving objects; and the emotions and actions they give rise to are to be classed, with many other æsthetic manifestations, sensitive and motor, as *incidental* features of our mental life. The philosophic brain responds to an inconsistency or a gap in its knowledge, just as the musical brain responds to a discord in what it hears. At certain ages the sensitiveness to particular gaps and the pleasure of resolving particular puzzles reach their maximum, and then it is that stores of scientific knowledge are easiest and most naturally laid in. But these effects may have had nothing to do with the uses for which the brain was originally given; and it is probably only within a few centuries, since religious beliefs and economic applications of science have played a prominent part in the conflicts of one race with another, that they may have helped to 'select' for survival a particular type of brain. I shall have to consider this matter of incidental and supernumerary faculties in [Chapter XXVIII](#).

Sociability and Shyness. As a gregarious animal, man is excited both by the absence and by the presence of his kind. To be alone is one of the greatest of evils for him. Solitary confinement is by many regarded as a mode of torture too cruel and unnatural for civilized countries to adopt. To one long pent up on a desert island, the sight of a human footprint or a human form in the distance would be the most tumultuously exciting of experiences. In morbid states of mind, one of the commonest symptoms is the fear of being alone. This fear may be assuaged by the presence of a little child, or even of a baby. In a case of hydrophobia known to the writer, the patient insisted on keeping his room *crowded* with neighbors all the while, so intense was his

fear of solitude. In a gregarious animal, the perception that he is alone excites him to vigorous activity. Mr. Galton thus describes the behavior of the South African cattle whom he had such good opportunities for observing:

"Although the ox has little affection for, or interest in, his fellows, he cannot endure even a momentary separation from his herd. If he be separated from it by stratagem or force, he exhibits every sign of mental agony; he strives with all his might to get back again, and when he succeeds he plunges into its middle to bathe his whole body with the comfort of closest companionship."^[387]

Man is also excited by the presence of his kind. The *bizarre* actions of dogs meeting strange dogs are not altogether without a parallel in our own constitution. We cannot meet strangers without a certain tension, or talk to them exactly as to our familiars. This is particularly the case if the stranger be an important personage. It may then happen that we not only shrink from meeting his eye, but actually cannot collect our wits or do ourselves any sort of justice in his presence.

"This odd state of mind," says Darwin,^[388] "is chiefly recognized by the face reddening, by the eyes being averted or cast down, and by awkward, nervous movements of the body.... Shyness seems to depend on sensitiveness to the opinion, whether good or bad, of others, more especially with respect to external appearance. Strangers neither know nor care anything about our conduct or character, but they may, and often do, criticise our appearance.... The consciousness of anything peculiar, or even new, in the dress, or any slight blemish on the person, and more especially on the face—points which are likely to attract the attention of strangers—makes the shy intolerably shy."^[389] On the other hand, in those cases in which conduct, and not personal appearance, is concerned, we are much more apt to be shy in the presence of acquaintances whose judgment we in some degree value than in that of strangers.... Some persons, however, are so sensitive that the mere act of speaking to almost any one is sufficient to rouse their self-consciousness, and a slight blush is the result. Disapprobation ... causes shyness and blushing much more readily than does

approbation.... Persons who are exceedingly shy are rarely shy in the presence of those with whom they are quite familiar, and of whose good opinion and sympathy they are quite assured; for instance, a girl in presence of her mother.... Shyness ... is closely related to fear; yet it is distinct from fear in the ordinary sense. A shy man dreads the notice of strangers, but can hardly be said to be afraid of them; he may be as bold as a hero in battle, and yet have no self-confidence about trifles in the presence of strangers. Almost every one is extremely nervous when first addressing a public assembly, and most men remain so through their lives."

As Mr. Darwin observes, a real dread of definite consequences may enter into this 'stage-fright' and complicate the shyness. Even so our shyness before an important personage may be complicated by what Professor Bain calls 'servile terror,' based on representation of definite dangers if we fail to please. But both stage-fright and servile terror may exist with the most indefinite apprehensions of danger, and, in fact, when our reason tells us there is no occasion for alarm. We must, therefore, admit a certain amount of purely instinctive perturbation and constraint, due to the consciousness that we have become objects for other people's eyes. Mr. Darwin goes on to say: "Shyness comes on at a very early age. In one of my own children, two years and three months old, I saw a trace of what certainly appeared to be shyness directed toward myself, after an absence from home of only a week." Every parent has noticed the same sort of thing. Considering the despotic powers of rulers in savage tribes, respect and awe must, from time immemorial, have been emotions excited by certain individuals; and stage-fright, servile terror, and shyness, must have had as copious opportunities for exercise as at the present time. Whether these impulses could ever have been useful, and selected for usefulness, is a question which, it would seem, can only be answered in the negative. Apparently they are pure hindrances, like fainting at sight of blood or disease, sea-sickness, a dizzy head on high places, and certain squeamishnesses of æsthetic taste. They are *incidental* emotions, in spite of which we get along. But they seem to play an important part in the production of two other propensities, about the instinctive character of which a good deal of controversy has prevailed. I refer to cleanliness and modesty, to which we must proceed, but not before

we have said a word about another impulse closely allied to shyness. I mean

Secretiveness, which, although often due to intelligent calculation and the dread of betraying our interests in some more or less definitely foreseen way, is quite as often a blind propensity, serving no useful purpose, and is so stubborn and ineradicable a part of the character as fully to deserve a place among the instincts. Its natural stimuli are unfamiliar human beings, especially those whom we respect. Its reactions are the arrest of whatever we are saying or doing when such strangers draw nigh, coupled often with the pretense that we were not saying or doing that thing, but possibly something different. Often there is added to this a disposition to mendacity when asked to give an account of ourselves. With many persons the first impulse, when the door-bell rings, or a visitor is suddenly announced, is to scuttle out of the room, so as not to be 'caught.' When a person at whom we have been looking becomes aware of us, our immediate impulse may be to look the other way, and pretend we have not seen him. Many friends have confessed to me that this is a frequent phenomenon with them in meeting acquaintances in the street, especially unfamiliar ones. The bow is a secondary correction of the primary feint that we do not see the other person. Probably most readers will recognize in themselves, at least, the *start*, the nascent disposition, on many occasions, to act in each and all of these several ways. That the 'start' is neutralized by second thought proves it to come from a deeper region than thought. There is unquestionably a native impulse in every one to conceal love-affairs, and the acquired impulse to conceal pecuniary affairs seems in many to be almost equally strong. It is to be noted that even where a given habit of concealment is reflective and deliberate, its motive is far less often definite prudence than a vague aversion to have one's sanctity invaded and one's personal concerns fingered and turned over by other people. Thus, some persons will never leave anything with their name written on it, where others may pick it up—even in the woods, an old envelope must not be thrown on the ground. Many cut all the leaves of a book of which they may be reading a single chapter, so that no one shall know which one they have singled out, and all

this with no *definite* notion of harm. The impulse to conceal is more apt to be provoked by superiors than by equals or inferiors. How differently do boys talk together when their parents are not by! Servants see more of their masters' characters than masters of servants'.^[390] Where we conceal from our equals and familiars, there is probably always a definite element of prudential prevision involved. *Collective* secrecy, mystery, enters into the emotional interest of many games, and is one of the elements of the importance men attach to freemasonries of various sorts, being delightful apart from any end.

Cleanliness. Seeing how very filthy savages and exceptional individuals among civilized people may be, philosophers have doubted whether any genuine instinct of cleanliness exists, and whether education and habit be not responsible for whatever amount of it is found. Were it an instinct, its stimulus would be dirt, and its characteristic reaction the shrinking from contact therewith, and the cleaning of it away after contact had occurred. Now, if some animals are cleanly, men *may* be so, and there can be no doubt that some kinds of matter *are* natively repugnant, both to sight, touch, and smell—excrementitious and putrid things, blood, pus, entrails, and diseased tissues, for example. It is true that the shrinking from contact with these things may be inhibited very easily, as by a medical education; and it is equally true that the impulse to clean them away may be inhibited by so slight an obstacle as the thought of the coldness of the ablution, or the necessity of getting up to perform it. It is also true than an impulse to cleanliness, habitually checked, will become obsolete fast enough. But none of these facts prove the impulse never to have been there.^[391] It seems to be there in all cases; and then to be particularly amenable to outside influences, the child having his own degree of squeamishness about what he shall touch or eat, and later being either hardened or made more fastidious still by the habits he is forced to acquire and the examples among which he lives.

Examples get their hold on him in this way, that a particularly evil-smelling or catarrhal or lousy comrade is rather offensive to him, and that he sees the odiousness in another of an amount of dirt to which he would have no spontaneous objection if it were on his own skin. That *we dislike in others*

things which we tolerate in ourselves is a law of our æsthetic nature about which there can be no doubt. But as soon as generalization and reflection step in, this judging of others leads to a new way of regarding ourselves. "Who taught you politeness? The impolite," is, I believe, a Chinese proverb. The concept, 'dirty fellow,' which we have formed, becomes one under which we personally shrink from being classed; and so we 'wash up,' and set ourselves right, at moments when our social self-consciousness is awakened, in a manner toward which no strictly instinctive native prompting exists. But the standard of cleanliness attained in this way is not likely to go beyond the mutual tolerance for one another of the members of the tribe, and hence may comport a good deal of actual filth.

Modesty, Shame. Whether there be an instinctive impulse to hide certain parts of the body and certain acts is perhaps even more open to doubt than whether there be an instinct of cleanliness. Anthropologists have denied it, and in the utter shamelessness of infancy and of many savage tribes have seemed to find a good basis for their views. It must, however, be remembered that infancy proves nothing, and that, as far as sexual modesty goes, the sexual impulse itself works directly against it at times of excitement, and with reference to certain people; and that habits of immodesty contracted with those people may forever afterwards inhibit it any impulse to be modest towards *them*. This would account for a great deal of actual immodesty, even if an original modest impulse were there. On the other hand, the modest impulse, if it do exist, must be admitted to have a singularly ill-defined sphere of influence, both as regards the presences that call it forth, and as regards the acts to which it leads. Ethnology shows it to have very little backbone of its own, and to follow easily fashion and example. Still, it is hard to see the ubiquity of *some* sort of tribute to shame, however perverted—as where female modesty consists in covering the face alone, or immodesty in appearing before strangers unpainted—and to believe it to have no impulsive root whatever. Now, what may the impulsive root be? I believe that, for one thing, it is shyness, the feeling of dread that unfamiliar persons, as explained above, may inspire us withal. Such persons are the original stimuli to our modesty.^[392] But the actions of modesty are

quite different from the actions of shyness. They consist of the restraint of certain bodily functions, and of the covering of certain parts; and why do such particular actions necessarily ensue? That there *may* be in the human animal, as such, a 'blind' and immediate automatic impulse to such restraints and coverings in respect-inspiring presences is a possibility difficult of actual disproof. But it seems more likely, from the facts, that the actions of modesty are suggested to us in a roundabout way; and that, even more than those of cleanliness, they arise from the application in the second instance to ourselves of judgments primarily passed upon our mates. It is not easy to believe that, even among the nakedest savages, an unusual degree of cynicism and indecency in an individual should not beget a certain degree of contempt, and cheapen him in his neighbor's eyes. Human nature is sufficiently homogeneous for us to be sure that everywhere reserve must inspire some respect, and that persons who suffer every liberty are persons whom others disregard. Not to be like such people, then, would be one of the first resolutions suggested by social self-consciousness to a child of nature just emerging from the unreflective state. And the resolution would probably acquire effective pungency for the first time when the social self-consciousness was sharpened into a real fit of shyness by some person being present whom it was important not to disgust or displease. Public opinion would of course go on to build its positive precepts upon this germ; and, through a variety of examples and experiences, the ritual of modesty would grow, until it reached the New England pitch of sensitiveness and range, making us say stomach instead of belly, limb instead of leg, retire instead of go to bed, and forbidding us to call a female dog by name.

At bottom this amounts to the admission that, though in some shape or other a natural and inevitable feature of human life, modesty need not necessarily be an instinct in the pure and simple excito-motor sense of the term.

Love. Of all propensities, the sexual impulses bear on their face the most obvious signs of being instinctive, in the sense of blind, automatic, and untaught. The teleology they contain is often at variance with the wishes of

the individuals concerned; and the actions are performed for no assignable reason but because Nature urges just that way. Here, if ever, then, we ought to find those characters of fatality, infallibility, and uniformity, which, we are told, make of actions done from instinct a class so utterly apart. But is this so? The facts are just the reverse: the sexual instinct is particularly liable to be checked and modified by slight differences in the individual stimulus, by the inward condition of the agent himself, by habits once acquired, and by the antagonism of contrary impulses operating on the mind. One of these is the ordinary shyness recently described; another is what might be called the *anti-sexual instinct*, the instinct of personal isolation, the actual repulsiveness to us of the idea of intimate contact with most of the persons we meet, especially those of our own sex.^[393] Thus it comes about that this strongest passion of all, so far from being the most 'irresistible,' may, on the contrary, be the hardest one to give rein to, and that individuals in whom the inhibiting influences are potent may pass through life and never find an occasion to have it gratified. There could be no better proof of the truth of that proposition with which we began our study of the instinctive life in man, that irregularity of behavior may come as well from the possession of too many instincts as from the lack of any at all.

The instinct of personal isolation, of which we have spoken, exists more strongly in men with respect to one another, and more strongly in women with respect to men. In women it is called coyness, and has to be positively overcome by a process of wooing before the sexual instinct inhibits it and takes its place. As Darwin has shown in his book on the 'Descent of Man and Sexual Selection,' it has played a vital part in the amelioration of all higher animal types, and is to a great degree responsible for whatever degree of chastity the human race may show. It illustrates strikingly, however, the law of the inhibition of instincts by habits—for, once broken through with a given person, it is not apt to assert itself again; and habitually broken through, as by prostitutes, with various persons, it may altogether decay. Habit also fixes it in us toward certain individuals: nothing is so particularly displeasing as the notion of close personal contact with those whom we have long known in a respectful and distant way. The fondness of the ancients and of modern Orientals for forms of unnatural vice, of which the notion affects us with horror, is probably a mere case of the way in which this instinct may be inhibited by habit. We can hardly suppose that the ancients had by gift of Nature a propensity of which we are

devoid, and were all victims of what is now a pathological aberration limited to individuals. It is more probable that with them the instinct of physical aversion toward a certain class of objects was inhibited early in life by *habits*, formed under the influence of *example*; and that then a kind of sexual appetite, of which very likely most men possess the germinal possibility, developed itself in an unrestricted way. That the development of it in an abnormal way may check its development in the normal way, seems to be a well-ascertained medical fact. And that the direction of the sexual instinct towards one individual tends to inhibit its application to other individuals, is a law, upon which, though it suffers many exceptions, the whole *régime* of monogamy is based. These details are a little unpleasant to discuss, but they show so beautifully the correctness of the general principles in the light of which our review has been made, that it was impossible to pass them over unremarked.

Jealousy is unquestionably instinctive.

Parental Love is an instinct stronger in woman than in man, at least in the early childhood of its object. I need do little more than quote Schneider's lively description of it as it exists in her:

"As soon as a wife becomes a mother her whole thought and feeling, her whole being, is altered. Until then she had only thought of her own well-being, of the satisfaction of her vanity; the whole world appeared made only for her; everything that went on about her was only noticed so far as it had personal reference to herself; she asked of every one that he should appear interested in her, pay her the requisite attention, and as far as possible fulfil her wishes. Now, however, the centre of the world is no longer herself, but her child. She does not think of her own hunger, she must first be sure that the child is fed. It is nothing to her that she herself is tired and needs rest, so long as she sees that the child's sleep is disturbed; the moment it stirs she awakes, though far

stronger noises fail to arouse her now. She, who formerly could not bear the slightest carelessness of dress, and touched everything with gloves, allows herself to be soiled by the infant, and does not shrink from seizing its clouts with her naked hands. Now, she has the greatest patience with the ugly, piping cry-baby (*Schreihals*), whereas until now every discordant sound, every slightly unpleasant noise, made her nervous. Every limb of the still hideous little being appears to her beautiful, every movement fills her with delight. She has, in one word, transferred her entire egoism to the child, and lives only in it. Thus, at least, it is in all unspoiled, naturally-bred mothers, who, alas! seem to be growing rarer; and thus it is with all the higher animal-mothers. The maternal joys of a cat, for example, are not to be disguised. With an expression of infinite comfort she stretches out her fore-legs to offer her teats to her children, and moves her tail with delight when the little hungry mouths tug and suck.... But not only the contact, the bare look of the offspring affords endless delight, not only because the mother thinks that the child will some day grow great and handsome and bring her many joys, but because she has received from Nature an instinctive love for her children. She does not herself know why she is so happy, and why the look of the child and the care of it are so agreeable, any more than the young man can give an account of why he loves a maiden, and is so happy when she is near. Few mothers, in caring for their child, think of the proper purpose of maternal love for the preservation of the species. Such a thought may arise in the father's mind; seldom in that of the mother. The latter feels only... that it is an everlasting delight to hold the being which she has brought forth protectingly in her arms, to dress it, to wash it, to rock it to sleep, or to still its hunger."

So far the worthy Schneider, to whose words may be added this remark, that the passionate devotion of a mother—ill herself, perhaps—to a sick or dying child is perhaps the most simply beautiful moral spectacle that human life affords. Contemning every danger, triumphing over every difficulty, outlasting all fatigue, woman's love is here invincibly superior to anything that man can show.

These are the most prominent of the tendencies which are worthy of being called instinctive in the human species.^[394] It will be observed that *no other mammal, not even the monkey, shows so large an array*. In a perfectly-rounded development, every one of these instincts would start a habit toward certain objects and inhibit a habit toward certain others. Usually this is the case; but, in the one-sided development of civilized life, it happens that the timely age goes by in a sort of starvation of objects, and the individual then grows up with gaps in his psychic constitution which future experiences can never fill. Compare the accomplished gentleman with the poor artisan or tradesman of a city: during the adolescence of the former, objects appropriate to his growing interests, bodily and mental, were offered as fast as the interests awoke, and, as a consequence, he is armed and equipped at every angle to meet the world. Sport came to the rescue and completed his education where real things were lacking. He has tasted of the essence of every side of human life, being sailor, hunter, athlete, scholar, fighter, talker, dandy, man of affairs, etc., all in one. Over the city poor boy's youth no such golden opportunities were hung, and in his manhood no desires for most of them exist. Fortunate it is for him if gaps are the only anomalies his instinctive life presents; perversions are too often the fruit of his unnatural bringing up.

[360] This chapter has already appeared (almost exactly as now printed) in the form of magazine articles in Scribner's Magazine and in the Popular Science Monthly for 1887.

[361] P. A. Chadbourne: Instinct, p. 28 (New York, 1872).

[362] "It would be very simple-minded to suppose that bees follow their queen, and protect her and care for her, because they are aware that without her the hive would become extinct. The odor or the aspect of their queen is manifestly agreeable to the bees—that is why they love her so. Does not all true love base itself on agreeable perceptions much more than on representations of utility?" (G. H. Schneider, *Der Thierische Wille*, p. 187.) *A priori*, there is no reason to suppose that *any* sensation might not in *some* animal cause *any* emotion and *any* impulse. To us it seems unnatural that an odor should directly excite anger or fear; or a color, lust. Yet there are creatures to which some smells are quite as frightful as any sounds, and very likely others to which color is as much a sexual irritant as form.

[363] *Der Thierische Wille*, pp. 282-3.

[364] In the instincts of mammals, and even of lower creatures, the uniformity and infallibility which, a generation ago, were considered as essential characters do not exist. The minuter study of recent years has found continuity, transition, variation, and mistake, wherever it has looked for them, and decided that what is called an instinct is usually only a tendency to act in a way of which the *average* is pretty constant, but which need not be mathematically 'true.' Cf. on this point Darwin's *Origin of Species*: Romanes's *Mental Evol.*, chaps. xi to xvi incl., and Appendix; W. L. Lindsay's *Mind in Lower Animals*, vol. i. 133-141: ii. chaps. v, xx; and K. Semper's *Conditions of Existence in Animals*, where a great many instances will be found.

[365] Spalding, *Macmillan's Magazine*, Feb. 1878, p. 287.

[366] *Ibid.* p. 289.

[367] For the cases in full see *Mental Evolution in Animals*, pp. 213-317.

[368] *Transactions of American Neurological Association*, vol. i. p. 129 (1875).

[369] "Mr. Spalding," says Mr. Lewes (*Problems of Life and Mind*, prob. i. chap. ii. § 22, note), "tells me of a friend of his who reared a gosling in the kitchen, away from all water; when this bird was some months old, and was taken to a pond, it not only refused to go into the water, but when thrown in scrambled out again, as a hen would have done. Here was an instinct entirely suppressed." See a similar observation on ducklings in T. R. R. Stebbing: *Essays on Darwinism* (London, 1871), p. 73.

[370] *Senses and Intellect*. 3d ed. pp. 413-675.

[371] *Nature*, xii. 507 (1875).

[372] See, for some excellent pedagogic remarks about *doing yourself* what you want to get your pupils to do, and not simply telling them to do it: Baumann, *Handbuch der Moral* (1879), p. 32 ff.

[373] Sympathy has been enormously written about in books on Ethics. A very good recent chapter is that by Thos. Fowler: *The Principles of Morals*, part ii. chap. ii.

[374] "I must now refer to a very general passion which occurs in boys who are brought up naturally, especially in the country. Everyone knows what pleasure a boy takes in the sight of a butterfly, fish, crab or other animal, or of a bird's nest, and what a strong propensity he has for pulling apart, breaking, opening, and destroying all complex objects, how he delights in pulling out the wings and legs of flies, and tormenting one animal or another, how greedy he is to steal secret dainties, with what irresistible strength the plundering of birds' nests attracts him without his having the least intention of eating the eggs or the young birds. This fact has long been familiar, and is daily remarked by teachers; but an explanation of these impulses which follow upon a mere perception of

the objects, without in most cases any representation being aroused of a future pleasure to be gained, has as yet been given by no one, and yet the impulses are very easy to explain. In many cases it will be said that the boy pulls things apart from curiosity. Quite correct: but whence comes this curiosity, this irresistible desire to open everything and see what is inside? What makes the boy take the eggs from the nest and destroy them when he never thinks of eating them? These are effects of an hereditary instinct, so strong that warnings and punishments are unable to counteract it." (Schneider: *Der Menschliche Wille*, p. 224. See also *Der Thierische Wille*, pp. 180-2.)

[375] It is not surprising, in view of the facts of animal history and evolution, that the very special object blood should have become the stimulus for a very special interest and excitement. That the sight of it should make people faint is strange. Less so that a child who sees his blood flow should forthwith become much more frightened than by the mere feeling of the cut. Horned cattle often, though not always, become furiously excited at the smell of blood. In some abnormal human beings the sight or thought of it exerts a baleful fascination. "B and his father were at a neighbor's one evening, and, while paring apples, the old man accidentally cut his hand so severely as to cause the blood to flow profusely. B was observed to become restless, nervous, pale, and to have undergone a peculiar change in demeanor. Taking advantage of the distraction produced by the accident, B escaped from the house and proceeded to a neighboring farm-yard, where he cut the throat of a horse, killing it." Dr. D. H. Tuke, commenting on this man's case (*Journal of Mental Science*, October, 1885), speaks of the influence of blood upon him—his whole life had been one chain of cowardly atrocities—and continues: "There can be no doubt that with some individuals it constitutes a fascination.... We might speak of a *mania sanguinis*. Dr. Savage admitted a man from France into Bethlehem Hospital some time ago, one of whose earliest symptoms of insanity was the thirst for blood, which he endeavored to satisfy by going to an abattoir in Paris. The man whose case I have brought forward had the same passion for gloating over blood, but had no attack of acute mania. The sight of blood was distinctly a delight to him, and at any time blood aroused in him the worst elements of his nature. Instances will easily be recalled in which murderers, undoubtedly insane, have described the intense pleasure they experienced in the warm blood of children."

[376] "Bombonnel, having rolled with a panther to the border of a ravine, gets his head away from the open mouth of the animal, and by a prodigious effort rolls her into the abyss. He gets up, blinded, spitting a mass of blood, not knowing exactly what the situation is. He thinks only of one thing, that he shall probably die of his wounds, but that before dying he must take vengeance on the panther. 'I didn't think of my pain,' he tells us. 'Possessed entirely by the fury with which I was transported, I drew my hunting-knife, and not understanding what had become of the beast, I sought for her on every side in order to continue the struggle. It was in this plight that the Arabs found me when they arrived.'" (Quoted by Guyan, *La Morale sans Obligation*, etc., p. 210.)

[377] *Psychologie de l'Enfant*, pp. 72-74. In an account of a young gorilla quoted from Falkenstein, by R. Hartmann ('Anthropoid Apes,' *International Scientific Series*, vol. lii (New York, 1886), p. 265), it is said: "He very much disliked strange noises. Thunder, the rain falling on the skylight, and especially the long-drawn note of a pipe or trumpet, threw him into such agitation as to cause a sudden affection of the digestive organs, and it became expedient to keep him at a distance. When he was slightly indisposed, we made use of this kind of music with results as successful as if we had administered purgative medicine."

[378] *Der Menschliche Wille*, p. 224.

[379] Cf. Romanes. *Mental Evolution*, etc., p. 156.

[380] In the 'Overland Monthly' for 1887, a most interesting article on Laura Bridgman's writings has been published by Mr. E. C. Sandford. Among other reminiscences of her early childhood, while she still knew nothing of the sign-language, the wonderful blind deaf-mute records the following item in her quaint language: "My father [he was a farmer and probably did his own butchering] used to enter

his kitchen bringing some killed animals in and deposited them on one of sides of the room many times. As I perceived it it make me shudder with terror because I did not know what the matter was. I hated to approach the dead. One morning I went to take a short walk with my Mother. I went into a snug house for some time. They took me into a room where there was a coffin. I put my hand in the coffin & felt something so queer. It frightened me unpleasantly. I found something dead wrapped in a silk h'd'k'f so carefully. It must have been a body that had had vitality.... I did not like to venture to examine the body for I was confounded."

[381] I lately saw a boy of five (who had been told the story of Hector and Achilles) teaching his younger brother, aged three, how to play Hector, while he himself should play Achilles, and chase him round the walls of Troy. Having armed themselves, Achilles advanced, shouting "Where's my Patroklos?" Whereupon the would-be Hector piped up, quite distracted from his *rôle*, "Where's my Patroklos? I want a Patroklos! I want a Patroklos!"—and broke up the game. Of what kind of a thing a Patroklos might be he had, of course, no notion—enough that his brother had one for him to claim one too.

[382] In 'The Nation' for September 3, 1886, President G. S. Hall has given some account of a statistical research on Boston school-boys, by Miss Wiltse, from which it appears that only nineteen out of two hundred and twenty-nine had made no collections.

[383] Quoted in Lindsay, 'Mind in Lower Animals,' vol. ii. p. 151.

[384] Cf. Flint, *Mind*, vol. i. pp. 330-383; Sully, *ibid.* p. 567. Most people probably have the *impulse* to keep bits of useless finery, old tools, pieces of once useful apparatus, etc.; but it is normally either inhibited at the outset by reflection, or, if yielded to, the objects soon grow displeasing and are thrown away.

[385] *Der Menschliche Wille*, p. 205.

[386] Professor Lazarus (*Die Reize des Spieles*, Berlin, 1883, p. 44) denies that we have an *instinct* to play, and says the root of the matter is the *aversion to remain unoccupied*, which substitutes a sham occupation when no real one is ready. No doubt this is true; but why the particular forms of sham occupation? The *elements* of all bodily games and of ceremonial games are given by direct excito-motor stimulations—just as when puppies chase one another and swallows have a parliament.

[387] *Inquiries into Human Faculty*, p. 72.

[388] *Expression of the Emotions* (New York, 1873), p. 330.

[389] "The certainty that we are well dressed," a charming woman has said, "gives us a peace of heart compared to which that yielded by the consolations of religion is as nothing."

[390] Thackeray, in his exquisite Roundabout Paper, 'On a Chalk-Mark on the Door,' says: "You get truth habitually from equals only; so, my good Mr. Holyshade, don't talk to me about the habitual candor of the young Etonian of high birth, or I have my own opinion of *your* candor or discernment when you do. No. Tom Bowling is the soul of honor, and has been true to Black-eyed Syousan since the last time they parted at Wapping Old Stairs; but do you suppose Tom is perfectly frank, familiar, and above-board in his conversation with Admiral Nelson, K. C. B.? There are secrets, prevarications, fibs, if you will, between Tom and the admiral—between your crew (of servants) and *their* captain. I know I hire a worthy, clean, agreeable, and conscientious male or female hypocrite at so many guineas a year to do so and so for me. Were he other than hypocrite, I would send him about his business."

[391] The insane symptom called "mysophobia," or dread of foulness, which leads a patient to wash his hands perhaps a hundred times a day, hardly seems explicable without supposing a primitive impulse to clean one's self of which it is, as it were, the convulsive exaggeration.

[392] "We often find modesty coming in only in the presence of foreigners, especially of clothed Europeans. Only before these do the Indian women in Brazil cover themselves with their girdle, only before these do the women on Timor conceal their bosom. In Australia we find the same thing happening." (Th. Waitz, *Anthropologie der Naturvölker*, vol. i. p 358.) The author gives bibliographical references, which I omit.

[393] To most of us it is even unpleasant to sit down in a chair still warm from occupancy by another person's body. To many, hand-shaking is disagreeable.

[394] Some will, of course, find the list too large, others too small. With the boundaries of instinct fading into reflex action below, and into acquired habit or suggested activity above, it is likely that there will always be controversy about just what to include under the class-name. Shall we add the propensity to walk along a curbstone, or any other narrow path, to the list of instincts? Shall we subtract secretiveness, as due to shyness or to fear? Who knows? Meanwhile our physiological method has this inestimable advantage, that such questions of limit have neither theoretical nor practical importance. The facts once noted, it matters little how they are named. Most authors give a shorter list than that in the text. The phrenologists add adhesiveness, inhabitiveness, love of approbation, etc., etc., to their list of 'sentiments,' which in the main agree with our list of instincts. Forlage, in his *System der Psychologie*, classes among the *Triebe* all the vegetative physiological functions. Santluis (*Zur Psychologie der Menschlichen Triebe*, Leipsic, 1864) says there are at bottom but three instincts, that of 'Being,' that of 'Function,' and that of 'Life.' The 'Instinct of Being' he subdivides into *animal*, embracing the activities of all the senses; and *psychical*, embracing the acts of the intellect and of the 'transempiric consciousness.' The 'Instinct of Function' he divides into *sexual*, *inclinal* (friendship, attachment, honor); and *moral* (religion, philanthropy, faith, truth, moral freedom, etc.). The 'Instinct of Life' embraces *conservation* (nutrition, motion); *sociability* (imitation, juridical and ethical arrangements); and *personal interest* (love of independence and freedom, acquisitiveness, self-defence). Such a muddled list as this shows how great are the advantages of the physiological analysis we have used.

CHAPTER XXV.^[395]

THE EMOTIONS.

In speaking of the instincts it has been impossible to keep them separate from the emotional excitements which go with them. Objects of rage, love, fear, etc., not only prompt a man to outward deeds, but provoke characteristic alterations in his attitude and visage, and affect his breathing, circulation, and other organic functions in specific ways. When the outward deeds are inhibited, these latter emotional expressions still remain, and we read the anger in the face, though the blow may not be struck, and the fear betrays itself in voice and color, though one may suppress all other sign. *Instinctive reactions and emotional expressions thus shade imperceptibly*

into each other. Every object that excites an instinct excites an emotion as well. Emotions, however, fall short of instincts, in that the emotional reaction usually terminates in the subject's own body, whilst the instinctive reaction is apt to go farther and enter into practical relations with the exciting object.

Emotional reactions are often excited by objects with which we have no practical dealings. A ludicrous object, for example, or a beautiful object are not necessarily objects to which we *do* anything; we simply laugh, or stand in admiration, as the case may be. The class of emotional, is thus rather larger than that of instinctive, impulses, commonly so called. Its stimuli are more numerous, and its expressions are more internal and delicate, and often less practical. The physiological plan and essence of the two classes of impulse, however, is the same.

As with instincts, so with emotions, the mere memory or imagination of the object may suffice to liberate the excitement. One may get angrier in thinking over one's insult than at the moment of receiving it; and we melt more over a mother who is dead than we ever did when she was living. In the rest of the chapter I shall use the word *object* of emotion indifferently to mean one which is physically present or one which is merely thought of.

It would be tedious to go through a complete list of the reactions which characterize the various emotions. For that the special treatises must be referred to. A few examples of their variety, however, ought to find a place here. Let me begin with the manifestations of Grief as a Danish physiologist, C. Lange, describes them:^[396]

"The chief feature in the physiognomy of grief is perhaps its paralyzing effect on the voluntary movements. This effect is by no means as extreme as that which fright produces, being seldom more than that degree of weakening which makes it cost an effort to perform actions usually done with ease. It is, in other words, a feeling of weariness; and (as in all weariness) movements are made slowly, heavily, without strength, unwillingly, and with exertion, and are limited to the fewest possible. By this the grieving person gets his outward stamp: he walks slowly, unsteadily, dragging his feet and hanging his arms. His voice is weak and without resonance, in consequence of the feeble activity of the muscles of expiration and of

the larynx. He prefers to sit still, sunk in himself and silent. The tonicity or 'latent innervation' of the muscles is strikingly diminished. The neck is bent, the head hangs ('bowed down' with grief), the relaxation of the cheek- and jaw-muscles makes the face look long and narrow, the jaw may even hang open. The eyes appear large, as is always the case where the *orbicularis* muscle is paralyzed, but they may often be partly covered by the upper lid which droops in consequence of the laming of its own *levator*. With this condition of weakness of the voluntary nerve- and muscle-apparatus of the whole body, there coexists, as aforesaid, just as in all states of similar motor weakness, a subjective feeling of weariness and heaviness, of something which weighs upon one; one feels 'downcast,' 'oppressed,' 'laden,' one speaks of his 'weight of sorrow,' one must 'bear up' under it, just as one must 'keep down' his anger. Many there are who 'succumb' to sorrow to such a degree that they literally cannot stand upright, but sink or lean against surrounding objects, fall on their knees, or, like Romeo in the monk's cell, throw themselves upon the earth in their despair.

"But this weakness of the entire voluntary motor apparatus (the so-called apparatus of 'animal' life) is only one side of the physiology of grief. Another side, hardly less important, and in its consequences perhaps even more so, belongs to another subdivision of the motor apparatus, namely, the involuntary or 'organic' muscles, especially those which are found in the walls of the blood-vessels, and the use of which is, by contracting, to diminish the latter's calibre. These muscles and their nerves, forming together the 'vaso-motor apparatus,' act in grief contrarily to the voluntary motor apparatus. Instead of being paralyzed, like the latter, the vascular muscles are more strongly contracted than usual, so that the tissues and organs of the body become anæmic. The immediate consequence of this bloodlessness is pallor and shrunkenness, and the pale color and collapsed features are the peculiarities which, in connection with the relaxation of the visage, give to the victim of grief his characteristic physiognomy, and often give an impression of emaciation which ensues too rapidly to be possibly due to real disturbance of nutrition, or waste uncompensated by repair. Another regular consequence of the bloodlessness of the skin is a feeling of cold, and shivering. A constant symptom of grief is

sensitiveness to cold, and difficulty in keeping warm. In grief, the inner organs are unquestionably anæmic as well as the skin. This is of course not obvious to the eye, but many phenomena prove it. Such is the diminution of the various secretions, at least of such as are accessible to observation. The mouth grows dry, the tongue sticky, and a bitter taste ensues which, it would appear, is only a consequence of the tongue's dryness. [The expression 'bitter sorrow' may possibly arise from this.] In nursing women the milk diminishes or altogether dries up. There is one of the most regular manifestations of grief, which apparently contradicts these other physiological phenomena, and that is the weeping, with its profuse secretion of tears, its swollen reddened face, red eyes, and augmented secretion from the nasal mucous membrane."

Lange goes on to suggest that this may be a reaction from a previously contracted vaso-motor state. The explanation seems a forced one. The fact is that there are changeable expressions of grief. The weeping is as apt as not to be immediate, especially in women and children. Some men can never weep. The tearful and the dry phases alternate in all who can weep, sobbing storms being followed by periods of calm; and the shrunken, cold, and pale condition which Lange describes so well is more characteristic of a severe settled sorrow than of an acute mental pain. Properly we have two distinct emotions here, both prompted by the same object, it is true, but affecting different persons, or the same person at different times, and *feeling* quite differently whilst they last, as anyone's consciousness will testify. There is an excitement during the crying fit which is not without a certain pungent pleasure of its own; but it would take a genius for felicity to discover any dash of redeeming quality in the feeling of dry and shrunken sorrow.—Our author continues:

"If the smaller vessels of the lungs contract so that these organs become anæmic, we have (as is usual under such conditions) the feeling of insufficient breath, and of oppression of the chest, and these tormenting sensations increase the sufferings of the griever, who seeks relief by long-drawn sighs, instinctively, like every one who lacks breath from whatever cause.^[397]

"The anæmia of the brain in grief is shown by intellectual inertia, dullness, a feeling of mental weariness, effort, and indisposition to work, often by sleeplessness. Indeed it is the anæmia of the motor centres of the brain which lies at the bottom of all that weakening of the voluntary powers of motion which we described in the first instance."

My impression is that Dr. Lange simplifies and universalizes the phenomena a little too much in this description, and in particular that he very likely overdoes the anæmia-business. But such as it is, his account may stand as a favorable specimen of the sort of descriptive work to which the emotions have given rise.

Take next another emotion, Fear, and read what Mr. Darwin says of its effects:

"Fear is often preceded by astonishment, and is so far akin to it that both lead to the senses of sight and hearing being instantly aroused. In both cases the eyes and mouth are widely opened and the eyebrows raised. The frightened man at first stands like a statue, motionless and breathless, or crouches down as if instinctively to escape observation. The heart beats quickly and violently, so that it palpitates or knocks against the ribs; but it is very doubtful if it then works more efficiently than usual, so as to send a greater supply of blood to all parts of the body; for the skin instantly becomes pale as during incipient faintness. This paleness of the surface, however, is probably in large part, or is exclusively, due to the vaso-motor centre being affected in such a manner as to cause the contraction of the small arteries of the skin. That the skin is much affected under the sense of great fear, we see in the marvellous manner in which perspiration immediately exudes from it. This exudation is all the more remarkable, as the surface is then cold, and hence the term, a cold sweat; whereas the sudorific glands are properly excited into action when the surface is heated. The hairs also on the skin stand erect, and the superficial muscles shiver. In connection with the disturbed action of the heart the breathing is hurried. The salivary glands act imperfectly; the mouth becomes dry and is often opened and shut. I have also noticed that under slight fear there is strong tendency to yawn. One of the best marked symptoms is

the trembling of all the muscles of the body; and this is often first seen in the lips. From this cause, and from the dryness of the mouth, the voice becomes husky or indistinct or may altogether fail. 'Obstupui steteruntque comæ, et vox faucibus hæsit.'... As fear increases into an agony of terror, we behold, as under all violent emotions, diversified results. The heart beats wildly or must fail to act and faintness ensue; there is a death-like pallor; the breathing is labored; the wings of the nostrils are widely dilated; there is a gasping and convulsive motion of the lips, a tremor on the hollow cheek, a gulping and catching of the throat; the uncovered and protruding eyeballs are fixed on the object of terror; or they may roll restlessly from side to side, *huc illuc volens oculos totumque pererrat*. The pupils are said to be enormously dilated. All the muscles of the body may become rigid or may be thrown into convulsive movements. The hands are alternately clenched and opened, often with a twitching movement. The arms may be protruded as if to avert some dreadful danger, or may be thrown wildly over the head. The Rev. Mr. Hagenauer has seen this latter action in a terrified Australian. In other cases there is a sudden and uncontrollable tendency to headlong flight; and so strong is this that the boldest soldiers may be seized with a sudden panic."^[398]

Finally take Hatred, and read the synopsis of its possible effects as given by Sig. Mantegazza:^[399]

"Withdrawal of the head backwards, withdrawal of the trunk; projection forwards of the hands, as if to defend one's self against the hated object; contraction or closure of the eyes; elevation of the upper lip and closure of the nose,—these are all elementary movements of turning away. Next threatening movements, as: intense frowning; eyes wide open; display of teeth; grinding teeth and contracting jaws; opened mouth with tongue advanced: clenched fists; threatening action of arms; stamping with the feet; deep inspirations—panting; growling and various cries; automatic repetition of one word or syllable; sudden weakness and trembling of voice; spitting. Finally, various miscellaneous reactions and vaso-motor symptoms: general trembling; convulsions of lips and facial muscles, of limbs and of trunk; acts of violence to one's self, as biting fist or nails; sardonic laughter; bright

redness of face; sudden pallor of face; extreme dilatation of nostrils; standing up of hair on head."

Were we to go through the whole list of emotions which have been named by men, and study their organic manifestations, we should but ring the changes on the elements which these three typical cases involve. Rigidity of this muscle, relaxation of that, constriction of arteries here, dilatation there, breathing of this sort or that, pulse slowing or quickening, this gland secreting and that one dry, etc., etc. We should, moreover, find that our descriptions had no absolute truth; that they only applied to the average man; that every one of us, almost, has some personal idiosyncrasy of expression, laughing or sobbing differently from his neighbor, or reddening or growing pale where others do not. We should find a like variation in the objects which excite emotion in different persons. Jokes at which one explodes with laughter nauseate another, and seem blasphemous to a third; and occasions which overwhelm me with fear or bashfulness are just what give you the full sense of ease and power. The internal shadings of emotional feeling, moreover, merge endlessly into each other. Language has discriminated some of them, as hatred, antipathy, animosity, dislike, aversion, malice, spite, vengefulness, abhorrence, etc., etc.; but in the dictionaries of synonyms we find these feelings distinguished more by their severally appropriate objective stimuli than by their conscious or subjective tone.

The result of all this flux is that the merely descriptive literature of the emotions is one of the most tedious parts of psychology. And not only is it tedious, but you feel that its subdivisions are to a great extent either fictitious or unimportant, and that its pretences to accuracy are a sham. But unfortunately there is little psychological writing about the emotions which is not merely descriptive. As emotions are described in novels, they interest us, for we are made to share them. We have grown acquainted with the concrete objects and emergencies which call them forth, and any knowing touch of introspection which may grace the page meets with a quick and feeling response. Confessedly literary works of aphoristic philosophy also flash lights into our emotional life, and give us a fitful delight. But as far as "scientific psychology" of the emotions goes, I may have been surfeited by too much reading of classic works on the subject, but I should as lief read verbal descriptions of the shapes of the rocks on a New Hampshire farm as

toil through them again. They give one nowhere a central point of view, or a deductive or generative principle. They distinguish and refine and specify *in infinitum*, without ever getting on to another logical level. Whereas the beauty of all truly scientific work is to get to ever deeper levels. Is there no way out from this level of individual description in the case of the emotions? I believe there is a way out, but I fear that few will take it.

The trouble with the emotions in psychology is that they are regarded too much as absolutely individual things. So long as they are set down as so many eternal and sacred psychic entities, like the old immutable species in natural history, so long all that *can* be done with them is reverently to catalogue their separate characters, points, and effects. But if we regard them as products of more general causes (as 'species' are now regarded as products of heredity and variation), the mere distinguishing and cataloguing becomes of subsidiary importance. Having the goose which lays the golden eggs, the description of each egg already laid is a minor matter. Now the general causes of the emotions are indubitably physiological. Prof. O. Lange, of Copenhagen, in the pamphlet from which I have already quoted, published in 1885 a physiological theory of their constitution and conditioning, which I had already broached the previous year in an article in *Mind*. None of the criticisms which I have heard of it have made me doubt its essential truth. I will therefore devote the next few pages to explaining what it is. I shall limit myself in the first instance to what may be called the *coarser* emotions, grief, fear, rage, love, in which every one recognizes a strong organic reverberation, and afterwards speak of the *subtler* emotions, or of those whose organic reverberation is less obvious and strong.

EMOTION FOLLOWS UPON THE BODILY EXPRESSION IN THE COARSER EMOTIONS AT LEAST.

Our natural way of thinking about these coarser emotions is that the mental perception of some fact excites the mental affection called the emotion, and that this latter state of mind gives rise to the bodily expression. My theory, on the contrary, is that *the bodily changes follow directly the perception of the exciting fact, and that our feeling of the same changes as they occur is the emotion*. Common-sense says, we lose our fortune, are sorry and weep; we meet a bear, are frightened and run; we are insulted by a rival, are angry

and strike. The hypothesis here to be defended says that this order of sequence is incorrect, that the one mental state is not immediately induced by the other, that the bodily manifestations must first be interposed between, and that the more rational statement is that we feel sorry because we cry, angry because we strike, afraid because we tremble, and not that we cry, strike, or tremble, because we are sorry, angry, or fearful, as the case may be. Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colorless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we should not actually *feel* afraid or angry.

Stated in this crude way, the hypothesis is pretty sure to meet with immediate disbelief. And yet neither many nor far-fetched considerations are required to mitigate its paradoxical character, and possibly to produce conviction of its truth.

To begin with, no reader of the last two chapters will be inclined to doubt the fact that *objects do excite bodily changes* by a preorganized mechanism, or the farther fact that *the changes are so indefinitely numerous and subtle that the entire organism may be called a sounding-board*, which every change of consciousness, however slight, may make reverberate. The various permutations and combinations of which these organic activities are susceptible make it abstractly possible that no shade of emotion, however slight, should be without a bodily reverberation as unique, when taken in its totality, as is the mental mood itself. The immense number of parts modified in each emotion is what makes it so difficult for us to reproduce in cold blood the total and integral expression of any one of them. We may catch the trick with the voluntary muscles, but fail with the skin, glands, heart, and other viscera. Just as an artificially imitated sneeze lacks something of the reality, so the attempt to imitate an emotion in the absence of its normal instigating cause is apt to be rather 'hollow.'

The next thing to be noticed is this, that *every one of the bodily changes, whatsoever it be, is FELT, acutely or obscurely, the moment it occurs*. If the reader has never paid attention to this matter, he will be both interested and astonished to learn how many different local bodily feelings he can detect in himself as characteristic of his various emotional moods. It would be perhaps too much to expect him to arrest the tide of any strong gust of

passion for the sake of any such curious analysis as this; but he can observe more tranquil states, and that may be assumed here to be true of the greater which is shown to be true of the less. Our whole cubic capacity is sensibly alive; and each morsel of it contributes its pulsations of feeling, dim or sharp, pleasant, painful, or dubious, to that sense of personality that every one of us unfailingly carries with him. It is surprising what little items give accent to these complexes of sensibility. When worried by any slight trouble, one may find that the focus of one's bodily consciousness is the contraction, often quite inconsiderable, of the eyes and brows. When momentarily embarrassed, it is something in the pharynx that compels either a swallow, a clearing of the throat, or a slight cough; and so on for as many more instances as might be named. Our concern here being with the general view rather than with the details, I will not linger to discuss these, but, assuming the point admitted that every change that occurs must be felt, I will pass on.

I now proceed to urge the vital point of my whole theory, which is this: *If we fancy some strong emotion, and then try to abstract from our consciousness of it all the feelings of its bodily symptoms, we find we have nothing left behind*, no 'mind-stuff' out of which the emotion can be constituted, and that a cold and neutral state of intellectual perception is all that remains. It is true that, although most people when asked say that their introspection verifies this statement, some persist in saying theirs does not. Many cannot be made to understand the question. When you beg them to imagine away every feeling of laughter and of tendency to laugh from their consciousness of the ludicrousness of an object, and then to tell you what the feeling of its ludicrousness would be like, whether it be anything more than the perception that the object belongs to the class 'funny,' they persist in replying that the thing proposed is a physical impossibility, and that they always *must* laugh if they see a funny object. Of course the task proposed is not the practical one of seeing a ludicrous object and annihilating one's tendency to laugh. It is the purely speculative one of subtracting certain elements of feeling from an emotional state supposed to exist in its fulness, and saying what the residual elements are. I cannot help thinking that all who rightly apprehend this problem will agree with the proposition above laid down. What kind of an emotion of fear would be left if the feeling neither of quickened heart-beats nor of shallow breathing, neither of trembling lips nor of weakened limbs, neither of goose-flesh nor of visceral

stirrings, were present, it is quite impossible for me to think. Can one fancy the state of rage and picture no ebullition in the chest, no flushing of the face, no dilatation of the nostrils, no clenching of the teeth, no impulse to vigorous action, but in their stead limp muscles, calm breathing, and a placid face? The present writer, for one, certainly cannot. The rage is as completely evaporated as the sensation of its so-called manifestations, and the only thing that can possibly be supposed to take its place is some cold-blooded and dispassionate judicial sentence, confined entirely to the intellectual realm, to the effect that a certain person or persons merit chastisement for their sins. In like manner of grief: what would it be without its tears, its sobs, its suffocation of the heart, its pang in the breast-bone? A feelingless cognition that certain circumstances are deplorable, and nothing more. Every passion in turn tells the same story. A purely disembodied human emotion is a nonentity. I do not say that it is a contradiction in the nature of things, or that pure spirits are necessarily condemned to cold intellectual lives; but I say that for *us*, emotion dissociated from all bodily feeling is inconceivable. The more closely I scrutinize my states, the more persuaded I become that whatever moods, affections, and passions I have are in very truth constituted by, and made up of, those bodily changes which we ordinarily call their expression or consequence; and the more it seems to me that if I were to become corporeally anæsthetic, I should be excluded from the life of the affections, harsh and tender alike, and drag out an existence of merely cognitive or intellectual form. Such an existence, although it seems to have been the ideal of ancient sages, is too apathetic to be keenly sought after by those born after the revival of the worship of sensibility, a few generations ago.

Let not this view be called materialistic. It is neither more nor less materialistic than any other view which says that our emotions are conditioned by nervous processes. No reader of this book is likely to rebel against such a saying so long as it is expressed in general terms; and if any one still finds materialism in the thesis now defended, that must be because of the special processes invoked. They are *sensational* processes, processes due to inward currents set up by physical happenings. Such processes have, it is true, always been regarded by the platonizers in psychology as having something peculiarly base about them. But our emotions must always be *inwardly* what they are, whatever be the physiological ground of their apparition. If they are deep, pure, worthy, spiritual facts on any conceivable

theory of their physiological source, they remain no less deep, pure, spiritual, and worthy of regard on this present sensational theory. They carry their own inner measure of worth with them; and it is just as logical to use the present theory of the emotions for proving that sensational processes need not be vile and material, as to use their vileness and materiality as a proof that such a theory cannot be true.

If such a theory is true, then each emotion is the resultant of a sum of elements, and each element is caused by a physiological process of a sort already well known. The elements are all organic changes, and each of them is the reflex effect of the exciting object. Definite questions now immediately arise—questions very different from those which were the only possible ones without this view. Those were questions of classification: "Which are the proper genera of emotion, and which the species under each?" or of description: "By what expression is each emotion characterized?" The questions now are *causal*: "Just what changes does this object and what changes does that object excite?" and "How come they to excite these particular changes and not others?" We step from a superficial to a deep order of inquiry. Classification and description are the lowest stage of science. They sink into the background the moment questions of genesis are formulated, and remain important only so far as they facilitate our answering these. Now the moment the genesis of an emotion is accounted for, as the arousal by an object of a lot of reflex acts which are forthwith felt, *we immediately see why there is no limit to the number of possible different emotions which may exist, and why the emotions of different individuals may vary indefinitely*, both as to their constitution and as to objects which call them forth. For there is nothing sacramental or eternally fixed in reflex action. Any sort of reflex effect is possible, and reflexes actually vary indefinitely, as we know.

"We have all seen men dumb, instead of talkative, with joy; we have seen fright drive the blood into the head of its victim, instead of making him pale; we have seen grief run restlessly about lamenting, instead of sitting bowed down and mute; etc., etc., and this naturally enough, for one and the same cause can work differently on different men's blood-vessels (since these do not always react alike), whilst moreover the impulse on its way through the brain to the vaso-motor

centre is differently influenced by different earlier impressions in the form of recollections or associations of ideas."^[400]

In short, *any classification of the emotions is seen to be as true and as 'natural' as any other*, if it only serves some purpose; and such a question as "What is the 'real' or 'typical' expression of anger, or fear?" is seen to have no objective meaning at all. Instead of it we now have the question as to how any given 'expression' of anger or fear may have come to exist; and that is a real question of physiological mechanics on the one hand, and of history on the other, which (like all real questions) is in essence answerable, although the answer may be hard to find. On a later page I shall mention the attempts to answer it which have been made.

DIFFICULTY OF TESTING THE THEORY EXPERIMENTALLY.

I have thus fairly propounded what seems to me the most fruitful way of conceiving of the emotions. It must be admitted that it is so far only a hypothesis, only *possibly* a true conception, and that much is lacking to its definite proof. The only way coercively to *disprove* it, however, would be to take some emotion, and then exhibit qualities of feeling in it which should be *demonstrably* additional to all those which could possibly be derived from the organs affected at the time. But to detect with certainty such purely spiritual qualities of feeling would obviously be a task beyond human power. We have, as Professor Lange says, absolutely no immediate criterion by which to distinguish between spiritual and corporeal feelings; and, I may add, the more we sharpen our introspection, the more *localized* all our qualities of feeling become (see above, Vol. I. p. 300) and the more difficult the discrimination consequently grows.^[401]

A positive proof of the theory would, on the other hand, be given if we could find a subject absolutely anæsthetic inside and out, but not paralytic, so that emotion-inspiring objects might evoke the usual bodily expressions from him, but who, on being consulted, should say that no subjective emotional affection was felt. Such a man would be like one who, because he eats, appears to bystanders to be hungry, but who afterwards confesses that he had no appetite at all. Cases like this are extremely hard to find. Medical literature contains reports, so far as I know, of but three. In the

famous one of Remigius Leins no mention is made by the reporters of his emotional condition. In Dr. G. Winter's case^[402] the patient is said to be inert and phlegmatic, but no particular attention, as I learn from Dr. W., was paid to his psychic condition. In the extraordinary case reported by Professor Strümpell (to which I must refer later in another connection)^[403] we read that the patient, a shoemaker's apprentice of fifteen, entirely anæsthetic, inside and out, with the exception of one eye and one ear, had shown *shame* on the occasion of soiling his bed, and *grief*, when a formerly favorite dish was set before him, at the thought that he could no longer taste its flavor. Dr. Strümpell is also kind enough to inform me that he manifested *surprise*, *fear*, and *anger* on certain occasions. In observing him, however, no such theory as the present one seems to have been thought of; and it always remains possible that, just as he satisfied his natural appetites and necessities in cold blood, with no inward feeling, so his emotional expressions may have been accompanied by a quite cold heart.^[404] Any new case which turns up of generalized anæsthesia ought to be carefully examined as to the inward emotional sensibility as distinct from the 'expressions' of emotion which circumstances may bring forth.

Objections Considered.

Let me now notice a few objections. The replies will make the theory still more plausible.

First Objection. There is no real evidence, it may be said, for the assumption that particular perceptions *do* produce wide-spread bodily effects by a sort of immediate physical influence, antecedent to the arousal of an emotion or emotional idea.

Reply. There is most assuredly such evidence. In listening to poetry, drama, or heroic narrative we are often surprised at the cutaneous shiver which like a sudden wave flows over us, and at the heart-swelling and the lachrymal effusion that unexpectedly catch us at intervals. In listening to music the same is even more strikingly true. If we abruptly see a dark moving form in the woods, our heart stops beating, and we catch our breath instantly and before any articulate idea of danger can arise. If our friend goes near to the edge of a precipice, we get the well-known feeling of 'all-overishness,' and we shrink back, although we positively *know* him to be safe, and have no

distinct imagination of his fall. The writer well remembers his astonishment, when a boy of seven or eight, at fainting when he saw a horse bled. The blood was in a bucket, with a stick in it, and, if memory does not deceive him, he stirred it round and saw it drip from the stick with no feeling save that of childish curiosity. Suddenly the world grew black before his eyes, his ears began to buzz, and he knew no more. He had never heard of the sight of blood producing faintness or sickness, and he had so little repugnance to it, and so little apprehension of any other sort of danger from it, that even at that tender age, as he well remembers, he could not help wondering how the mere physical presence of a pailful of crimson fluid could occasion in him such formidable bodily effects.

Professor Lange writes:

"No one has ever thought of separating the emotion produced by an unusually loud sound from the true inward affections. No one hesitates to call it a sort of fright, and it shows the ordinary signs of fright. And yet it is by no means combined with the idea of danger, or in any way occasioned by associations, memories, or other mental processes. The phenomena of flight follow the noise immediately without a trace of 'spiritual' fear. Many men can never grow used to standing beside a cannon when it is fired off, although they perfectly know that there is danger neither for themselves nor for others—the bare sound is too much for them."^[405]

Imagine two steel knife-blades with their keen edges crossing each other at right angles, and moving to and fro. Our whole nervous organization is 'on-edge' at the thought; and yet what emotion can be there except the unpleasant nervous feeling itself, or the dread that more of it may come? The entire fund and capital of the emotion here is the senseless bodily effect which the blades immediately arouse. This case is typical of a class: where an ideal emotion seems to precede the bodily symptoms, it is often nothing but an anticipation of the symptoms themselves. One who has already fainted at the sight of blood may witness the preparations for a surgical operation with uncontrollable heart-sinking and anxiety. He anticipates certain feelings, and the anticipation precipitates their arrival. In cases of morbid terror the subjects often confess that what possesses them seems, more than anything, to be fear of the fear itself. In the various forms of what

Professor Bain calls 'tender emotion,' although the appropriate object must usually be directly contemplated before the emotion can be aroused, yet sometimes thinking of the symptoms of the emotion itself may have the same effect. In sentimental natures the thought of 'yearning' will produce real 'yearning.' And, not to speak of coarser examples, a mother's imagination of the caresses she bestows on her child may arouse a spasm of parental longing.

In such cases as these we see plainly how the emotion both begins and ends with what we call its effects or manifestations. It has no mental *status* except as either the vivid feeling of the manifestations, or the idea of them; and the latter thus constitute its entire material, and sum and substance. And these cases ought to make us see how in all cases the feeling of the manifestations may play a much deeper part in the constitution of the emotion than we are wont to suppose.

The best proof that the immediate cause of emotion is a physical effect on the nerves is furnished by *those pathological cases in which the emotion is objectless*. One of the chief merits, in fact, of the view which I propose seems to be that we can so easily formulate by its means pathological cases and normal cases under a common scheme. In every asylum we find examples of absolutely unmotivated fear, anger, melancholy, or conceit; and others of an equally unmotivated apathy which persists in spite of the best of outward reasons why it should give way. In the former cases we must suppose the nervous machinery to be so 'labile' in some one emotional direction that almost every stimulus (however inappropriate) causes it to upset in that way, and to engender the particular complex of feelings of which the psychic body of the emotion consists. Thus, to take one special instance, if inability to draw deep breath, fluttering of the heart, and that peculiar epigastric change felt as 'precordial anxiety,' with an irresistible tendency to take a somewhat crouching attitude and to sit still, and with perhaps other visceral processes not now known, all spontaneously occur together in a certain person; his feeling of their combination *is* the emotion of dread, and he is the victim of what is known as morbid fear. A friend who has had occasional attacks of this most distressing of all maladies tells

me that in his case the whole drama seems to centre about the region of the heart and respiratory apparatus, that his main effort during the attacks is to get control of his inspirations and to slow his heart, and that the moment he attains to breathing deeply and to holding himself erect, the dread, *ipso facto*, seems to depart.^[406]

The emotion here is nothing but the feeling of a bodily state, and it has a purely bodily cause.

"All physicians who have been much engaged in general practice have seen cases of dyspepsia in which constant low spirits and occasional attacks of terror rendered the patient's condition pitiable in the extreme. I have observed these cases often, and have watched them closely, and I have never seen greater suffering of any kind than I have witnessed during these attacks.... Thus, a man is suffering from what we call nervous dyspepsia. Some day, we will suppose in the middle of the afternoon, without any warning or visible cause, one of these attacks of terror comes on. The first thing the man feels is great but vague discomfort. Then he notices that his heart is beating much too violently. At the same time shocks or flashes as of electrical discharges, so violent as to be almost painful, pass one after another through his body and limbs. Then in a few minutes he falls into a condition of the most intense fear. He is not afraid of anything; he is simply afraid. His mind is perfectly clear. He looks for a cause of his wretched condition, but sees none. Presently his terror is such that he trembles violently and utters low moans; his body is damp with perspiration; his mouth is perfectly dry; and at this stage there are no tears in his eyes, though his suffering is intense. When the climax of the attack is reached and passed, there is a copious flow of tears, or else a mental condition in which the person weeps upon the least provocation. At this stage a large quantity of pale urine is passed. Then the heart's action becomes again normal, and the attack passes off."^[407]

Again:

"There are outbreaks of rage so groundless and unbridled that all must admit them to be expressions of disease. For the medical layman hardly anything can be more instructive than the observation of such a

pathological attack of rage, especially when it presents itself pure and unmixed with other psychical disturbances. This happens in that rather rare disease named transitory mania. The patient predisposed to this—otherwise an entirely reasonable person—will be attacked suddenly without the slightest outward provocation, and thrown (to use the words of the latest writer on the subject, O. Schwartzer, *Die transitorische Tobsucht*, Wien, 1880), 'into a paroxysm of the wildest rage, with a fearful and blindly furious impulse to do violence and destroy.' He flies at those about him; strikes, kicks, and throttles whomever he can catch; dashes every object about which he can lay his hands on; breaks and crushes what is near him; tears his clothes; shouts, howls, and roars, with eyes that flash and roll, and shows meanwhile all those symptoms of vaso-motor congestion which we have learned to know as the concomitants of anger. His face is red, swollen, his cheeks hot, his eyes protuberant and their whites bloodshot, the heart beats violently, the pulse marks 100-120 strokes a minutes. The arteries of the neck are full and pulsating, the veins are swollen, the saliva flows. The fit lasts only a few hours, and ends suddenly with a sleep of from 8 to 12 hours, on waking from which the patient has entirely forgotten what has happened."^[408]

In these (outwardly) causeless emotional conditions the particular paths which are explosive are discharged by any and every incoming sensation. Just as, when we are seasick, every smell, every taste, every sound, every sight, every movement, every sensible experience whatever, augments our nausea, so the morbid terror or anger is increased by each and every sensation which stirs up the nerve-centres. Absolute quiet is the only treatment for the time. It seems impossible not to admit that in all this the bodily condition takes the lead, and that the mental emotion follows. The *intellect* may, in fact, be so little affected as to play the cold-blooded spectator all the while, and note the absence of a real object for the emotion.
^[409]

A few words from Henle may close my reply to this first objection:

"Does it not seem as if the excitations of the bodily nerves met the ideas half way, in order to raise the latter to the height of emotions? [Note how justly this expresses our theory!] That they do so is proved

by the cases in which particular nerves, when specially irritable, share in the emotion and determine its quality. When one is suffering from an open wound, any grievous or horrid spectacle will cause pain in the wound. In sufferers from heart-disease there is developed a psychic excitability, which is often incomprehensible to the patients themselves, but which comes from the heart's liability to palpitate. I said that the very quality of the emotion is determined by the organs disposed to participate in it. Just as surely as a dark foreboding, rightly grounded on inference from the constellations, will be accompanied by a feeling of oppression in the chest, so surely will a similar feeling of oppression, when due to disease of the thoracic organs, be accompanied by groundless forebodings. So small a thing as a bubble of air rising from the stomach through the œsophagus, and loitering on its way a few minutes and exerting pressure on the heart, is able during sleep to occasion a nightmare, and during waking to produce a vague anxiety. On the other hand, we see that joyous thoughts dilate our blood-vessels, and that a suitable quantity of wine, because it dilates the vessels, also disposes us to joyous thoughts. If both the jest and the wine work together, they supplement each other in producing the emotional effect, and our demands on the jest are the more modest in proportion as the wine takes upon itself a larger part of the task."^[410]

Second Objection. If our theory be true, a necessary corollary of it ought to be this: that any voluntary and cold-blooded arousal of the so-called manifestations of a special emotion ought to give us the emotion itself. Now this (the objection says) is not found to be the case. An actor can perfectly simulate an emotion and yet be inwardly cold; and we can all pretend to cry and not feel grief; and feign laughter without being amused.

Reply. In the majority of emotions this test is inapplicable; for many of the manifestations are in organs over which we have no voluntary control. Few people in pretending to cry can shed real tears, for example. But, within the limits in which it can be verified, experience corroborates rather than disproves the corollary from our theory, upon which the present objection rests. Every one knows how panic is increased by flight, and how the giving

way to the symptoms of grief or anger increases those passions themselves. Each fit of sobbing makes the sorrow more acute, and calls forth another fit stronger still, until at last repose only ensues with lassitude and with the apparent exhaustion of the machinery. In rage, it is notorious how we 'work ourselves up' to a climax by repeated outbreaks of expression. Refuse to express a passion, and it dies. Count ten before venting your anger, and its occasion seems ridiculous. Whistling to keep up courage is no mere figure of speech. On the other hand, sit all day in a moping posture, sigh, and reply to everything with a dismal voice, and your melancholy lingers. There is no more valuable precept in moral education than this, as all who have experience know: if we wish to conquer undesirable emotional tendencies in ourselves, we must assiduously, and in the first instance cold-bloodedly, go through the *outward movements* of those contrary dispositions which we prefer to cultivate. The reward of persistency will infallibly come, in the fading out of the sullenness or depression, and the advent of real cheerfulness and kindness in their stead. Smooth the brow, brighten the eye, contract the dorsal rather than the ventral aspect of the frame, and speak in a major key, pass the genial compliment, and your heart must be frigid indeed if it do not gradually thaw!

This is recognized by all psychologists, only they fail to see its full import. Professor Bain writes, for example:

"We find that a feeble [emotional] wave... is suspended inwardly by being arrested outwardly; the currents of the brain and the agitation of the centres die away if the external vent is resisted at every point. It is by such restraint that we are in the habit of suppressing pity, anger, fear, pride—on many trifling occasions. If so, it is a fact that the suppression of the actual movements has a tendency to suppress the nervous currents that incite them, so that the external quiescence is followed by the internal. The effect would not happen in any case *if there were not some dependence of the cerebral wave upon the free outward vent or manifestation....* By the same interposition we may summon up a dormant feeling. By acting out the external manifestations, we gradually infect the nerves leading to them, and finally waken up the diffusive current by a sort of action *ab extra....* Thus it is that we are sometimes able to assume a cheerful tone of mind by forcing a hilarious expression."^[411]

We have a mass of other testimony of similar effect. Burke, in his treatise on the Sublime and Beautiful, writes as follows of the physiognomist Campanella:

"This man, it seems, had not only made very accurate observations on human faces, but was very expert in mimicking such as were in any way remarkable. When he had a mind to penetrate into the inclinations of those he had to deal with, he composed his face, his gesture, and his whole body, as nearly as he could, into the exact similitude of the person he intended to examine; and then carefully observed what turn of mind he seemed to acquire by the change. So that, says my author, he was able to enter into the dispositions and thoughts of people as effectually as if he had been changed into the very men. I have often observed [Burke now goes on in his own person] that, on mimicking the looks and gestures of angry, or placid, or frightened, or daring men, I have involuntarily found my mind turned to that passion whose appearance I strove to imitate; nay, I am convinced it is hard to avoid it, though one strove to separate the passion from its corresponding gestures."^[412]

Against this it is to be said that many actors who perfectly mimic the outward appearances of emotion in face, gait, and voice declare that they feel no emotion at all. Others, however, according to Mr. Wm. Archer, who has made a very instructive statistical inquiry among them, say that the emotion of the part masters them whenever they play it well.^[413] Thus:

"'I often turn pale,' writes Miss Isabel Bateman, 'in scenes of terror or great excitement. I have been told this many times, and I can feel myself getting very cold and shivering and pale in thrilling situations.' 'When I am playing rage or terror,' writes Mr. Lionel Brough, 'I believe I do turn pale. My mouth gets dry, my tongue cleaves to my palate. In Bob Acres, for instance (in the last act), I have to continually moisten my mouth, or I shall become inarticulate. I have to "swallow the lump," as I call it.' All artists who have had much experience of emotional parts are absolutely unanimous.... 'Playing with the brain,' says Miss Alma Murray, 'is far less fatiguing than playing with the heart. An adventuress taxes the physique far less than a sympathetic

heroine. Muscular exertion has comparatively little to do with it.'... 'Emotion while acting,' writes Mr. Howe, 'will induce perspiration much more than physical exertion. I always perspired profusely while acting Joseph Surface, which requires little or no exertion.'... 'I suffer from fatigue,' writes Mr. Forbes Robertson, 'in proportion to the amount of emotion I may have been called upon to go through, and not from physical exertion.'... 'Though I have played Othello,' writes Mr. Coleman, 'ever since I was seventeen (at nineteen I had the honor of acting the Moor to Macready's Iago), husband my resources as I may, this is the one part, the part of parts, which always leaves me physically prostrate. I have never been able to find a pigment that would stay on my face, though I have tried every preparation in existence. Even the titanic Edwin Forrest told me that he was always knocked over in Othello, and I have heard Charles Kean, Phelps, Brooke, Dillion, say the same thing. On the other hand, I have frequently acted Richard III. without turning a hair.'"^[414]

The explanation for the discrepancy amongst actors is probably that which these quotations suggest. The *visceral and organic* part of the expression can be suppressed in some men, but not in others, and on this it is probable that the chief part of the felt emotion depends. Coquelin and the other actors who are inwardly cold are probably able to affect the dissociation in a complete way. Prof. Sikorsky of Kieff has contributed an important article on the facial expression of the insane to the *Neurologisches Centralblatt* for 1887. Having practised facial mimicry himself a great deal, he says:

"When I contract my facial muscles in any mimetic combination, *I feel no emotional excitement*, so that the mimicry is in the fullest sense of the word artificial, although quite irreproachable from the expressive point of view."^[415]

We find, however, from the context that Prof. S.'s practice before the mirror has developed in him such a virtuosity in the control of his facial muscles that he can entirely disregard their natural association and contract them in any order of grouping, on either side of the face isolatedly, and each one alone. Probably in him the facial mimicry is an entirely restricted and localized thing, without sympathetic changes of any sort elsewhere.

Third Objection. Manifesting an emotion, so far from increasing it, makes it cease. Rage evaporates after a good outburst; it is *pent-up* emotions that "work like madness in the brain."

Reply. The objection fails to discriminate between what is felt *during* and what is felt *after* the manifestation. *During* the manifestation the emotion is always felt. In the normal course of things this, being the natural channel of discharge, exhausts the nerve-centres, and emotional calm ensues. But if tears or anger are simply suppressed, whilst the object of grief or rage remains unchanged before the mind, the current which would have invaded the normal channels turns into others, for it must find some outlet of escape. It may then work different and worse effects later on. Thus vengeful brooding may replace a burst of indignation; a dry heat may consume the frame of one who fain would weep, or he may, as Dante says, turn to stone

within; and then tears or a storming fit may bring a grateful relief. This is when the current is strong enough to strike into a pathological path when the normal one is dammed. When this is so, an immediate outpour may be best. But here, to quote Prof. Bain again:

"There is nothing more implied than the fact that an emotion may be too strong to be resisted, and we only waste our strength in the endeavor. If we are really able to stem the torrent, there is no more reason for refraining from the attempt than in the case of weaker feelings. And undoubtedly the *habitual* control of the emotions is not to be attained without a systematic restraint, extended to weak and strong."

When we teach children to repress their emotional talk and display, it is not that they may *feel* more—quite the reverse. It is that they may *think* more; for, to a certain extent, whatever currents are diverted from the regions below, must swell the activity of the thought-tracts of the brain. In apoplexies and other brain injuries we get the opposite condition—an obstruction, namely, to the passage of currents among the thought-tracts, and with this an increased tendency of objects to start downward currents into the organs of the body. The consequence is tears, laughter, and temper-fits, on the most insignificant provocation, accompanying a proportional feebleness in logical thought and the power of volitional attention and decision,—just the sort of thing from which we try to wean our child. It is true that we say of certain persons that "they would feel more if they expressed less." And in another class of persons the explosive energy with which passion manifests itself on critical occasions seems correlated with the way in which they bottle it up during the intervals. But these are only eccentric types of character, and within each type the law of the last paragraph prevails. The sentimentalist is so constructed that 'gushing' is his or her normal mode of expression. Putting a stopper on the 'gush' will only to a limited extent cause more 'real' activities to take its place; in the main it will simply produce listlessness. On the other hand, the ponderous and bilious 'slumbering volcano,' let him repress the expression of his passions as he will, will find them expire if they get no vent at all; whilst if the rare occasions multiply which he deems worthy of their outbreak, he will find

them grow in intensity as life proceeds. On the whole, I cannot see that this third objection carries any weight.

If our hypothesis is true, it makes us realize more deeply than ever how much our mental life is knit up with our corporeal frame, in the strictest sense of the term. Rapture, love, ambition, indignation, and pride, considered as feelings, are fruits of the same soil with the grossest bodily sensations of pleasure and of pain. But the reader will remember that we agreed at the outset to affirm this only of what we then called the 'coarser' emotions, and that those inward states of emotional sensibility which appeared devoid at first sight of bodily results should be left out of our account. We must now say a word or two about these latter feelings, the 'subtler' emotions, as we then agreed to call them.

THE SUBTLER EMOTIONS.

These are the moral, intellectual, and æsthetic feelings. Concords of sounds, of colors, of lines, logical consistencies, teleological fitnesses, affect us with a pleasure that seems ingrained in the very form of the representation itself, and to borrow nothing from any reverberation surging up from the parts below the brain. The Herbartian psychologists have distinguished feelings due to the *form* in which ideas may be arranged. A mathematical demonstration may be as 'pretty,' and an act of justice as 'neat,' as a drawing or a tune, although the prettiness and neatness seem to have nothing to do with sensation. We have, then, or some of us seem to have, genuinely *cerebral* forms of pleasure and displeasure, apparently not agreeing in their mode of production with the 'coarser' emotions we have been analyzing. And it is certain that readers whom our reasons have hitherto failed to convince will now start up at this admission, and consider that by it we give up our whole case. Since musical perceptions, since logical ideas, can immediately arouse a form of emotional feeling, they will say, is it not more natural to suppose that in the case of the so-called 'coarser' emotions, prompted by other kinds of objects, the emotional feeling is equally

immediate, and the bodily expression something that comes later and is added on?

In reply to this we must immediately insist that æsthetic emotion, *pure and simple*, the pleasure given us by certain lines and masses, and combinations of colors and sounds, is an absolutely sensational experience, an optical or auricular feeling that is primary, and not due to the repercussion backwards of other sensations elsewhere consecutively aroused. To this simple primary and immediate pleasure in certain pure sensations and harmonious combinations of them, there may, it is true, be *added* secondary pleasures; and in the practical enjoyment of works of art by the masses of mankind these secondary pleasures play a great part. The more *classic* one's taste is, however, the less relatively important are the secondary pleasures felt to be in comparison with those of the primary sensation as it comes in.^[416] Classicism and romanticism have their battles over this point. Complex suggestiveness, the awakening of vistas of memory and association, and the stirring of our flesh with picturesque mystery and gloom, make a work of art *romantic*. The classic taste brands these effects as coarse and tawdry, and prefers the naked beauty of the optical and auditory sensations, unadorned with frippery or foliage. To the romantic mind, on the contrary, the immediate beauty of these sensations seems dry and thin. I am of course not discussing which view is right, but only showing that the discrimination between the primary feeling of beauty, as a pure incoming sensible quality, and the secondary emotions which are grafted thereupon, is one that must be made.

These secondary emotions themselves are assuredly for the most part constituted of other incoming sensations aroused by the diffusive wave of reflex effects which the beautiful object sets up. A glow, a pang in the breast, a shudder, a fulness of the breathing, a flutter of the heart, a shiver down the back, a moistening of the eyes, a stirring in the hypogastrium, and a thousand unnamable symptoms besides, may be felt the moment the beauty *excites* us. And these symptoms also result when we are excited by moral perceptions, as of pathos, magnanimity, or courage. The voice breaks

and the sob rises in the struggling chest, or the nostril dilates and the fingers tighten, whilst the heart beats, etc., etc.

As far as *these ingredients* of the subtler emotions go, then, the latter form no exception to our account, but rather an additional illustration thereof. In all cases of intellectual or moral rapture we find that, unless there be coupled a bodily reverberation of some kind with the mere thought of the object and cognition of its quality; unless we actually laugh at the neatness of the demonstration or witticism; unless we thrill at the case of justice, or tingle at the act of magnanimity; our state of mind can hardly be called emotional at all. It is in fact a mere intellectual perception of how certain things are to be called—neat, right, witty, generous, and the like. Such a judicial state of mind as this is to be classed among awarenesses of truth; it is a *cognitive* act. As a matter of fact, however, the moral and intellectual cognitions hardly ever do exist thus unaccompanied. The bodily sounding-board is at work, as careful introspection will show, far more than we usually suppose. Still, where long familiarity with a certain class of effects, even æsthetic ones, has blunted mere emotional excitability as much as it has sharpened taste and judgment, we do get the intellectual emotion, if such it can be called, pure and undefiled. And the dryness of it, the paleness, the absence of all glow, as it may exist in a thoroughly expert critic's mind, not only shows us what an altogether different thing it is from the 'coarser' emotions we considered first, but makes us suspect that almost the entire difference lies in the fact that the bodily sounding-board, vibrating in the one case, is in the other mute. "Not so very bad" is, in a person of consummate taste, apt to be the highest limit of approving expression. "*Rien ne me choque*" is said to have been Chopin's superlative of praise of new music. A sentimental layman would feel, and ought to feel, horrified, on being admitted into such a critic's mind, to see how cold, how thin, how void of human significance, are the motives for favor or disfavor that there prevail. The capacity to make a nice spot on the wall will outweigh a picture's whole content; a foolish trick of words will preserve a poem; an utterly meaningless fitness of sequence in one musical composition set at naught any amount of 'expressiveness' in another.

I remember seeing an English couple sit for more than an hour on a piercing February day in the Academy at Venice before the celebrated 'Assumption' by Titian; and when I, after being chased from room to room by the cold,

concluded to get into the sunshine as fast as possible and let the pictures go, but before leaving drew reverently near to them to learn with what superior forms of susceptibility they might be endowed, all I overheard was the woman's voice murmuring: "What a *deprecatory* expression her face wears! What self-abnegation! How *unworthy* she feels of the honor she is receiving!" Their honest hearts had been kept warm all the time by a glow of spurious sentiment that would have fairly made old Titian sick. Mr. Ruskin somewhere makes the (for him terrible) admission that religious people as a rule care little for pictures, and that when they do care for them they generally prefer the worst ones to the best. Yes! in every art, in every science, there is the keen perception of certain relations being *right* or not, and there is the emotional flush and thrill consequent thereupon. And these are two things, not one. In the former of them it is that experts and masters are at home. The latter accompaniments are bodily commotions that they may hardly feel, but that may be experienced in their fulness by *crétins* and philistines in whom the critical judgment is at its lowest ebb. The 'marvels' of Science, about which so much edifying popular literature is written, are apt to be 'caviare' to the men in the laboratories. And even divine Philosophy itself, which common mortals consider so 'sublime' an occupation, on account of the vastness of its data and outlook, is too apt to the practical philosopher himself to be but a sharpening and tightening business, a matter of 'points,' of screwing down things, of splitting hairs, and of the 'intent' rather than the 'extent' of conceptions. Very little emotion here!—except the effort of setting the attention fine, and the feeling of ease and relief (mainly in the breathing apparatus) when the inconsistencies are overcome and the thoughts run smoothly for a while. Emotion and cognition seem then parted even in this last retreat; and cerebral processes are almost feelingless, so far as we can judge, until they summon help from parts below.

NO SPECIAL BRAIN-CENTRES FOR EMOTION.

If the neural process underlying emotional consciousness be what I have now sought to prove it, the physiology of the brain becomes a simpler matter than has been hitherto supposed. Sensational, associational, and motor elements are all that the organ need contain. The physiologists who, during the past few years, have been so industriously exploring the brain's

functions, have limited their explanations to its cognitive and volitional performances. Dividing the brain into sensory and motor centres, they have found their division to be exactly paralleled by the analysis made by empirical psychology of the perceptive and volitional parts of the mind into their simplest elements. But the emotions have been so ignored in all these researches that one is tempted to suppose that if these investigators were asked for a theory of them in brain-terms, they would have to reply, either that they had as yet bestowed no thought upon the subject, or that they had found it so difficult to make distinct hypotheses that the matter lay among the problems of the future, only to be taken up after the simpler ones of the present should have been definitively solved.

And yet it is even now certain that of two things concerning the emotions, one must be true. Either separate and special centres, affected to them alone, are their brain-seat, or else they correspond to processes occurring in the motor and sensory centres already assigned, or in others like them, not yet known. If the former be the case, we must deny the view that is current, and hold the cortex to be something more than the surface of 'projection' for every sensitive spot and every muscle in the body. If the latter be the case, we must ask whether the emotional *process* in the sensory or motor centre be an altogether peculiar one, or whether it resembles the ordinary perceptive processes of which those centres are already recognized to be the seat. Now if the theory I have defended be true, the latter alternative is all that it demands. Supposing the cortex to contain parts, liable to be excited by changes in each special sense-organ, in each portion of the skin, in each muscle, each joint, and each viscus, and to contain absolutely nothing else, we still have a scheme capable of representing the process of the emotions. An object falls on a sense-organ, affects a cortical part, and is perceived; or else the latter, excited inwardly, gives rise to an idea of the same object. Quick as a flash, the reflex currents pass down through their preordained channels, alter the condition of muscle, skin, and viscus; and these alterations, perceived, like the original object, in as many portions of the cortex, combine with it in consciousness and transform it from an object-simply-apprehended into an object-emotionally-felt. No new principles have to be invoked, nothing postulated beyond the ordinary reflex circuits, and the local centres admitted in one shape or another by all to exist.

EMOTIONAL DIFFERENCES BETWEEN INDIVIDUALS.

The revivability in memory of the emotions, like that of all the feelings of the lower senses, is very small. We can remember that we underwent grief or rapture, but not just how the grief or rapture felt. This difficult *ideal* revivability is, however, more than compensated in the case of the emotions by a very easy *actual* revivability. That is, we can produce, not remembrances of the old grief or rapture, but new griefs and raptures, by summoning up a lively thought of their exciting cause. The cause is now only an idea, but this idea produces the same organic irradiations, or almost the same, which were produced by its original, so that the emotion is again a reality. We have 'recaptured' it. Shame, love, and anger are particularly liable to be thus revived by ideas of their object. Professor Bain admits^[417] that "in their strict character of emotion proper, they [the emotions] have the minimum of revivability; but being always incorporated with the sensations of the higher senses, they share in the superior revivability of sights and sounds." But he fails to point out that the revived sights and sounds may be *ideal* without ceasing to be distinct; whilst the emotion, to be distinct, must become real again. Prof. Bain seems to forget that an 'ideal emotion' and a real emotion prompted by an ideal object are two very different things.

An emotional temperament on the one hand, and a lively imagination for objects and circumstances on the other, are thus the conditions, necessary and sufficient, for an abundant emotional life. No matter how emotional the temperament may be, if the imagination be poor, the occasions for touching off the emotional trains will fail to be realized, and the life will be *pro tanto* cold and dry. This is perhaps a reason why it may be better that a man of thought should not have too strong a visualizing power. He is less likely to have his trains of meditation disturbed by emotional interruptions. It will be remembered that Mr. Galton found the members of the Royal Society and of the French Academy of Sciences to be below par in visualizing power. If I may speak of myself, I am far less able to visualize now, at the age of 46, than in my earlier years; and I am strongly inclined to believe that the relative sluggishness of my emotional life at present is quite as much connected with this fact as it is with the invading torpor of hoary eld, or with the omnibus-horse routine of settled professional and domestic life. I say this because I occasionally have a flash of the old stronger visual

imagery, and I notice that the emotional commentary, so to call it, is then liable to become much more acute than is its present wont. Charcot's patient, whose case is given above on [p. 58](#) ff., complained of his incapacity for emotional feeling after his optical images were gone. His mother's death, which in former times would have wrung his heart, left him quite cold; largely, as he himself suggests, because he could form no definite visual image of the event, and of the effect of the loss on the rest of the family at home.

One final generality about the emotions remains to be noted: *They blunt themselves by repetition more rapidly than any other sort of feeling.* This is due not only to the general law of 'accommodation' to their stimulus which we saw to obtain of all feelings whatever, but to the peculiar fact that the 'diffusive wave' of reflex effects tends always to become more narrow. It seems as if it were essentially meant to be a provisional arrangement, on the basis of which precise and determinate reactions might arise. The more we exercise ourselves at anything, the fewer muscles we employ; and just so, the oftener we meet an object, the more definitely we think and behave about it; and the less is the organic perturbation to which it gives rise. The first time we saw it we could perhaps neither act nor think at all, and had no reaction but organic perturbation. The emotions of startled surprise, wonder, or curiosity were the result. Now we look on with absolutely no emotion. ^[418] This tendency to economy in the nerve-paths through which our sensations and ideas discharge, is the basis of all growth in efficiency, readiness, and skill. Where would the general, the surgeon, the presiding chairman, be, if their nerve-currents kept running down into their viscera, instead of keeping up amid their convolutions? But what they gain for practice by this law, they lose, it must be confessed, for feeling. For the world-worn and experienced man, the sense of pleasure which he gets from the free and powerful flow of thoughts, overcoming obstacles as they arise, is the only compensation for that freshness of the heart which he once enjoyed. This free and powerful flow means that brain-paths of association and memory have more and more organized themselves in him, and that through them the stimulus is drafted off into nerves which lead merely to the writing finger or the speaking tongue. ^[419] The trains of *intellectual* association, the memories, the logical relations, may, however, be voluminous in the extreme. Past emotions may be among the things

remembered. The more of all these trains an object can set going in us, the richer our cognitive intimacy with it is. This cerebral sense of richness seems itself to be a source of pleasure, possibly even apart from the *euphoria* which from time to time comes up from respiratory organs. If there *be* such a thing as a purely spiritual emotion, I should be inclined to restrict it to this cerebral sense of abundance and ease, this feeling, as Sir W. Hamilton would call it, of unimpeded and not overstrained activity of thought. Under ordinary conditions, it is a fine and serene but not an excited state of consciousness. In certain intoxications it becomes exciting, and it may be intensely exciting. I can hardly imagine a more frenzied excitement than that which goes with the consciousness of seeing absolute truth, which characterizes the coming to from nitrous-oxide drunkenness. Chloroform, ether, and alcohol all produce this deepening sense of insight into truth; and with all of them it may be a 'strong' emotion; but then there also come with it all sorts of strange bodily feelings and changes in the incoming sensibilities. I cannot see my way to affirming that the emotion is independent of these. I will concede, however, that if its independence is anywhere to be maintained, these theoretic raptures seem the place at which to begin the defence.

THE GENESIS OF THE VARIOUS EMOTIONS.

On a former page ([pp. 453-4](#)) I said that two questions, and only two, are important, if we regard the emotions as constituted by feelings due to the diffusive wave.

(1) *What special diffusive effects do the various special objective and subjective experiences excite?* and

(2) *How come they to excite them?*

The works on physiognomy and expression are all of them attempts to answer question 1. As is but natural, the effects upon the face have received the most careful attention. The reader who wishes details additional to those given above on [pp. 443-7](#) is referred to the works mentioned in the note below.^[420]

As regards question 2, some little progress has of recent years been made in answering it. Two things are certain:

a. The facial muscles of expression are not given us simply for expression's sake;^[421]

b. Each muscle is not affected to some one emotion exclusively, as certain writers have thought.

Some movements of expression can be accounted for as *weakened repetitions of movements which formerly* (when they were stronger) *were of utility to the subject*. Others are similarly weakened repetitions of movements which under other conditions were *physiologically necessary effects*. Of the latter reactions the respiratory disturbances in anger and fear might be taken as examples—organic reminiscences, as it were, reverberations in imagination of the blowings of the man making a series of combative efforts, of the pantings of one in precipitate flight. Such at least is a suggestion made by Mr. Spencer which has found approval. And he also was the first, so far as I know, to suggest that other movements in anger and fear could be explained by the nascent excitation of formerly useful acts.

"To have in a slight degree," he says, "such psychical states as accompany the reception of wounds, and are experienced during flight, is to be in a state of what we call fear. And to have in a slight degree such psychical states as the processes of catching, killing, and eating imply, is to have the desires to catch, kill, and eat. That the propensities to the acts are nothing else than nascent excitations of the psychical state involved in the acts, is proved by the natural language of the propensities. Fear, when strong, expresses itself in cries, in efforts to escape, in palpitations, in tremblings; and these are just the manifestations that go along with an actual suffering of the evil feared. The destructive passion is shown in a general tension of the muscular system, in gnashing of teeth and protrusion of the claws, in dilated eyes and nostrils, in growls; and these are weaker forms of the actions that accompany the killing of prey. To such objective evidences every one can add subjective evidences. Every one can testify that the psychical state called fear consists of mental representations of certain painful results; and that the one called anger consists of mental representations of the actions and impressions which would occur while inflicting some kind of pain."^[422]

About fear I shall have more to say presently. Meanwhile the principle of *revival in weakened form of reactions useful in more violent dealings with the object inspiring the emotion*, has found many applications. So slight a symptom as the snarl or sneer, the one-sided uncovering of the upper teeth, is accounted for by Darwin as a survival from the time when our ancestors had large canines, and unfleshed them (as dogs now do) for attack. Similarly the raising of the eyebrows in outward attention, the opening of the mouth in astonishment, come, according to the same author, from the utility of these movements in extreme cases. The raising of the eyebrows goes with the opening of the eye for better vision; the opening of the mouth with the intensest listening, and with the rapid catching of the breath which precedes muscular effort. The distention of the nostrils in anger is interpreted by Spencer as an echo of the way in which our ancestors had to breathe when, during combat, their "mouth was filled up by a part of an antagonist's body that had been seized(!)." The trembling of fear is supposed by Mantegazza to be for the sake of warming the blood(!). The reddening of the face and neck is called by Wundt a compensatory arrangement for relieving the brain of the blood-pressure which the simultaneous excitement of the heart brings with it. The effusion of tears is explained both by this author and by Darwin to be a blood-withdrawing agency of a similar sort. The contraction of the muscles around the eyes, of which the primitive use is to protect those organs from being too much gorged with blood during the screaming fits of infancy, survives in adult life in the shape of the frown, which instantly comes over the brow when anything difficult or displeasing presents itself either to thought or action.

"As the habit of contracting the brows has been followed by infants during innumerable generations, at the commencement of every crying or screaming fit," says Darwin, "it has become firmly associated with the incipient sense of something distressing or disagreeable. Hence, under similar circumstances, it would be apt to be continued during maturity, although never then developed, into a crying fit. Screaming or weeping begins to be voluntarily restrained at an early period of life, whereas frowning is hardly ever restrained at any age."^[423]

The intermittent expirations which constitute laughter have, according to Dr. Hecker, the purpose of counteracting the anæmia of the brain, which he

supposes to be brought about by the action of the joyous or comic stimulus upon the vaso-motor nerves.^[424] A smile is the weak vestige of a laugh. The tight closure of the mouth in all effort is useful for retaining the air in the lungs so as to fix the chest and give a firm basis of insertion for the muscles of the flanks. Accordingly, we see the lips compress themselves upon every slight occasion of resolve. The blood-pressure has to be high during the sexual embrace; hence the palpitations, and hence also the tendency to caressing action, which accompanies tender emotion in its fainter forms. Other examples might be given; but these are quite enough to show the scope of the principle of revival of useful action in weaker form.

Another principle, to which Darwin perhaps hardly does sufficient justice, may be called the principle of *reacting similarly to analogous-feeling stimuli*. There is a whole vocabulary of descriptive adjectives common to impressions belonging to different sensible spheres—experiences of all classes are *sweet*, impressions of all classes *rich* or *solid*, sensations of all classes *sharp*. Wundt and Piderit accordingly explain many of our most expressive reactions upon moral causes as symbolic gustatory movements. As soon as any experience arises which has an affinity with the feeling of sweet, or bitter, or sour, the same movements are executed which would result from the taste in point.^[425] "All the states of mind which language designates by the metaphors bitter, harsh, sweet, combine themselves, therefore, with the corresponding mimetic movements of the mouth." Certainly the emotions of disgust and satisfaction do express themselves in this mimetic way. Disgust is an incipient regurgitation or retching, limiting its expression often to the grimace of the lips and nose; satisfaction goes with a sucking smile, or tasting motion of the lips. In Mantegazza's loose if learned work, the attempt is made, much less successfully, to bring in the eye and ear as additional sources of symbolically expressive reaction. The ordinary gesture of negation—among us, moving the head about its axis from side to side—is a reaction originally used by babies to keep disagreeables from getting into their mouth, and may be observed in perfection in any nursery.^[426] It is now evoked where the stimulus is only an unwelcome idea. Similarly the nod forward in affirmation is after the

analogy of taking food into the mouth. The connection of the expression of moral or social disdain or dislike, especially in women, with movements having a perfectly definite original olfactory function, is too obvious for comment. Winking is the effect of any threatening surprise, not only of what puts the eyes in danger; and a momentary aversion of the eyes is very apt to be one's first symptom of response to an unexpectedly unwelcome proposition.—These may suffice as examples of movements expressive from analogy.

But if certain of our emotional reactions can be explained by the two principles invoked—and the reader will himself have felt how conjectural and fallible in some of the instances the explanation is—there remain many reactions which cannot so be explained at all, and these we must write down for the present as purely idiopathic effects of the stimulus. Amongst them are the effects on the viscera and internal glands, the dryness of the mouth and diarrhoea and nausea of fear, the liver-disturbances which sometimes produce jaundice after excessive rage, the urinary secretion of sanguine excitement, and the bladder-contraction of apprehension, the gaping of expectancy, the 'lump in the throat' of grief, the tickling there and the swallowing of embarrassment, the 'precordial anxiety' of dread, the changes in the pupil, the various sweatings of the skin, cold or hot, local or general, and its flushings, together with other symptoms which probably exist but are too hidden to have been noticed or named. It seems as if even the changes of blood-pressure and heart-beat during emotional excitement might, instead of being teleologically determined, prove to be purely mechanical or physiological outpourings through the easiest drainage-channels—the pneumogastrics and sympathetic nerves happening under ordinary circumstances to be such channels.

Mr. Spencer argues that the *smallest* muscles must be such channels; and instances the tail in dogs, cats, and birds, the ears in horses, the crest in parrots, the face and fingers in man, as the first organs to be moved by emotional stimuli.^[427] This principle (if it be one) would apply still more easily to the muscles of the smaller arteries (though not exactly to the heart); whilst the great variability of the circulatory symptoms would also suggest that they are determined by causes into which utility does not enter. The quickening of the heart lends itself, it is true, rather easily to explanation by inherited habit, organic memory of more violent excitement;

and Darwin speaks in favor of this view (see his *Expression*, etc., pp. 74-5). But, on the other hand, we have so many cases of reaction which are indisputably pathological, as we may say, and which could never be serviceable or derived from what was serviceable, that I think we should be cautious about pushing our explanations of the varied heart-beat too far in the teleological direction. Trembling, which is found in many excitements besides that of terror, is, *pace* Mr. Spencer and Sig. Mantegazza, quite pathological. So are terror's other strong symptoms. Professor Mosso, as the total result of his study, writes as follows:

"We have seen that the graver the peril becomes, the more do the reactions which are positively harmful to the animal prevail in number and in efficacy. We already saw that the trembling and the palsy make it incapable of flight or defence; we have also convinced ourselves that in the most decisive moments of danger we are less able to see [or to think] than when we are tranquil. In face of such facts we must admit that the phenomena of fear cannot all be accounted for by 'selection.' Their extreme degrees are morbid phenomena which show an imperfection in the organism. We might almost say that Nature had not been able to frame a substance which should be excitable enough to compose the brain and spinal marrow, and yet which should not be so excited by exceptional stimulation as to overstep in its reactions those physiological bounds which are useful to the conservation of the creature."^[428]

Professor Bain, if I mistake not, had long previously commented upon fear in a similar way.

Mr. Darwin accounts for many emotional expressions by what he calls the principle of antithesis. In virtue of this principle, if a certain stimulus prompted a certain set of movements, then a contrary-feeling stimulus would prompt exactly the opposite movements, although these might otherwise have neither utility nor significance. It is in this wise that Darwin explains the expression of impotence, raised eyebrows, and shrugged shoulders, dropped arms and open palms, as being the antithesis of the frowning brow, the thrown-back shoulders, and clenched fists of rage, which is the emotion of power. No doubt a certain number of movements can be formulated under this law; but whether it expresses a *causal*

principle is more than doubtful. It has been by most critics considered the least successful of Darwin's speculations on this subject.

To sum up, we see the reason for a few emotional reactions; for others a possible species of reason may be guessed; but others remain for which no plausible reason can even be conceived. These may be reactions which are purely mechanical results of the way in which our nervous centres are framed, reactions which, although permanent in us now, may be called accidental as far as their origin goes. In fact, in an organism as complex as the nervous system there *must* be many such reactions, incidental to others evolved for utility's sake, but which would never themselves have been evolved independently, for any utility they might possess. Sea-sickness, the love of music, of the various intoxicants, nay, the entire æsthetic life of man, shall have to trace to this accidental origin.^[429] It would be foolish to suppose that none of the reactions called emotional could have arisen in this *quasi*-accidental way.

This is all I have to say about the emotions. If one should seek to name each particular one of them of which the human heart is the seat, it is plain that the limit to their number would lie in the introspective vocabulary of the seeker, each race of men having found names for some shade of feeling which other races have left undiscriminated. If then we should seek to break the emotions, thus enumerated, into groups, according to their affinities, it is again plain that all sorts of groupings would be possible, according as we chose this character or that as a basis, and that all groupings would be equally real and true. The only question would be, does this grouping or that suit our purpose best? The reader may then class the emotions as he will, as sad or joyous, sthenic or asthenic, natural or acquired, inspired by animate or inanimate things, formal or material, sensuous or ideal, direct or reflective, egoistic or non-egoistic, retrospective, prospective or immediate, organismally or environmentally initiated, or what more besides. All these are divisions which have been actually proposed. Each of them has its merits, and each one brings together some emotions which the others keep apart. For a fuller account, and for other classificatory schemes, I refer to the Appendix to Bain's *Emotions and the Will*, and to Mercier's, Stanley's, and Read's articles on the Emotions, in *Mind*, vols. ix, x, and xi. In vol. ix. p. 421 there is also an article by the lamented Edmund Gurney in criticism of the view which in this chapter I continue to defend.

[395] Parts of this chapter have already appeared in an article published in 1884 in *Mind*.

[396] *Ueber Gemüthsbewegungen*, uebersetzt von H. Kurella (Leipzig, 1887).

[397] The bronchial tubes may be contracted as well as the ramifications of the pulmonary artery. Professor J. Henle has, amongst his *Anthropologische Vorträge*, an exquisite one on the 'Natural History of the Sigh,' in which he represents our inspirations as the result of a battle between the red muscles of our skeleton, ribs, and diaphragm, and the white ones of the lungs, which seek to narrow the calibre of the air-tubes. "In the normal state the former easily conquer, but under other conditions they either conquer with difficulty or are defeated.... The contrasted emotions express themselves in similarly contrasted wise, by spasm and paralysis of the unstriped muscles, and for the most part alike in all the organs which are provided with them, as arteries, skin, and bronchial tubes. The contrast among the emotions is generally expressed by dividing them into exciting and depressing ones. It is a remarkable fact that the depressing emotions, like fear, horror, disgust, increase the contraction of these smooth muscles, whilst the exciting emotions, like joy, anger, etc., make them relax. Contrasts of temperature act similarly, cold like the depressing, and warmth like the exciting, emotions. Cold produces pallor and goose-flesh, warmth smooths out the skin and widens the vessels. If one notices the uncomfortable mood brought about by strained expectation, anxiety before a public address, vexation at an unmerited affront, etc., one finds that the suffering part of it concentrates itself principally in the chest, and that it consists in a soreness, hardly to be called pain, felt in the middle of the breast and due to an unpleasant resistance which is offered to the movements of inspiration, and sets a limit to their extent. The insufficiency of the diaphragm is obtruded upon consciousness, and we try by the aid of the external voluntary chest-muscles to draw a deeper breath. [This is the sigh.] If we fail, the unpleasantness of the situation is increased, for then to our mental distress is added the corporeally repugnant feeling of lack of air, a slight degree of suffocation. If, on the contrary, the outer muscles overcome the resistance of the inner ones, the oppressed breast is lightened. We think we speak symbolically when we speak of a stone weighing on our heart, or of a burden rolled from off our breast. But really we only express the exact fact, for we should have to raise the entire weight of the atmosphere (about 820 kilog.) at each inspiration, if the air did not balance it by streaming into our lungs." (P. 55.) It must not be forgotten that an inhibition of the inspiratory centre similar to that produced by exciting the superior laryngeal nerve may possibly play a part in these phenomena. For a very interesting discussion of the respiratory difficulty and its connection with anxiety and fear, see 'A Case of Hydrophobia' by the lamented Thos. B. Curtis in the *Boston Med. and Surg. Journal*, Nov. 7 and 14, 1878, and remarks thereon by James J. Putnam, *ibid.* Nov. 21.

[398] *Origin of the Emotions*, Darwin, pp. 290-2.

[399] *La Physionomie et l'Expression des Sentiments* (Paris, 1885), p. 140.

[400] Lange, *op. cit.* p. 75.

[401] Professor Höffding, in his excellent treatise on Psychology, admits (p. 342) the mixture of bodily sensation with purely spiritual affection in the emotions. He does not, however, discuss the difficulties of discerning the spiritual affection (nor even show that he has fairly considered them) in his contention that it exists.

[402] Ein Fall von allgemeiner Anæsthesie (Heidelberg, 1882).

[403] Ziemssen's Deutsches Archiv für klinische Medicin, xxii. 321.

[404] The not very uncommon cases of hysterical hemianæsthesia are not complete enough to be utilized in this inquiry. Moreover, the recent researches, of which some account was given in Chapter IV, tend to show that hysterical anæsthesia is not a real absence of sensibility, but a 'dissociation,' as M. Pierre Janet calls it, or splitting-off of certain sensations from the rest of the person's consciousness, this *rest* forming the self which remains connected with the ordinary organs of expression. The split-off consciousness forms a secondary self; and M. Janet writes me that he sees no reason why sensations whose 'dissociation' from the body of consciousness makes the patient practically anæsthetic, might not, nevertheless, contribute to the emotional life of the patient. They do still contribute to the function of locomotion; for in his patient L. there was no ataxia in spite of the anæsthesia. M. Janet writes me, apropos of his anæsthetic patient L., that she seemed to 'suffer by hallucination.' "I have often pricked or burned her without warning, and when she did not see me. She never moved, and evidently perceived nothing. But if afterwards in her movements she caught sight of her wounded arm, and *saw* on her skin a little drop of blood resulting from a slight cut, she would begin to cry out and lament as if she suffered a great deal. 'My blood flows,' she said one day; 'I *must be* suffering a great deal!' She suffered by hallucination. This sort of suffering is very general in hysterics. It is enough for them to receive the slightest hint of a modification in their body, when their imagination fills up the rest and invents changes that were not felt." See the remarks published at a later date in Janet's *Automatisme Psychologique*, pp. 214-15.

[405] *Op. cit.* p. 63.

[406] It must be confessed that there are cases of morbid fear in which objectively the heart is not much perturbed. These, however, fail to prove anything against our theory, for it is of course possible that the cortical centres normally percipient of dread as a complex of cardiac and other organic sensations due to real bodily change, should become *primarily* excited in brain-disease, and give rise to an hallucination of the changes being there,—an hallucination of dread, consequently, coexistent with a comparatively calm pulse, etc. I say it is possible, for I am ignorant of observations which might test the fact. Trance, ecstasy, etc., offer analogous examples,—not to speak of ordinary dreaming. Under all these conditions one may have the liveliest subjective feelings, either of eye or ear, or of the more visceral and emotional sort, as a result of pure nerve-central activity, and yet, as I believe, with complete peripheral repose.

[407] R. M. Bucke: *Man's Moral Nature* (N. Y., 1879), p. 97.

[408] Lange, *op. cit.* p. 61.

[409] I am inclined to think that in some hysteriform conditions of grief, rage, etc., the visceral disturbances are less strong than those which go to outward expression. We have then a tremendous verbal display with a hollow inside. Whilst the bystanders are wrung with compassion, or pale with alarm, the subject all the while lets himself go, but feels his insincerity, and wonders how long he can keep up the performance. The attacks are often surprisingly sudden in their onset. The treatment here is to intimidate the patient by a stronger will. Take out your temper, if he takes out his—"Nay, if thou'lt mouth, I'll rant as well as thou." These are the cases of apparently great bodily manifestation with comparatively little real subjective emotion, which may be used to throw discredit on the theory advanced in the text.—It is probable that the *visceral* manifestations in these cases are quite

disproportionately slight, compared with those of the vocal organs. The subject's state is somewhat similar to that of an actor who does not feel his part.

[410] *Op. cit.* p. 73.—Lange lays great stress on the neurotic drugs, as parts of his proof that influences of a physical nature upon the body are the first thing in order in the production of emotions.

[411] Emotions and Will, pp. 361-2.

[412] Quoted by Dugald Stewart, *Elements, etc.* (Hamilton's ed.), iii. 140. Fechner (*Vorschule der Aesthetik*, 156) says almost the same thing of himself: "One may find by one's own observation that the *imitation* of the bodily expression of a mental condition makes us understand it much better than the merely looking on.... When I walk behind some one whom I do not know, and imitate as accurately as possible his gait and carriage, I get the most curious impression of feeling as the person himself must feel. To go tripping and mincing after the fashion of a young woman puts one, so to speak, in a feminine mood of mind."

[413] 'The Anatomy of Acting,' in Longman's Magazine, vol. xi. pp. 266, 375, 498 (1888), since republished in book form.

[414] P. 394.

[415] P. 496.

[416] Even the feelings of the lower senses may have this secondary escort, due to the arousing of associational trains which reverberate. A flavor may fairly shake us by the ghosts of 'banquet halls deserted,' which it suddenly calls up; or a smell may make us feel almost sick with the waft it brings over our memory of 'gardens that are ruins, and pleasure-houses that are dust.' "In the Pyrenees," says M. Guyau, "after a summer-day's tramp carried to the extreme of fatigue, I met a shepherd and asked him for some milk. He went to fetch from his hut, under which a brook ran, a jar of milk plunged in the water and kept at a coldness which was almost icy. In drinking this fresh milk *into which all the mountain had put its perfume*, and of which each savory swallow seemed to give new life, I certainly experienced a series of feelings which the word *agreeable* is insufficient to designate. It was like a pastoral symphony, apprehended by the taste instead of by the ear" (quoted by F. Paulhan from 'Les Problèmes de l'Æsthétique Contemporaine,' p. 63).—Compare the dithyrambic about whiskey of Col. R. Ingersoll, to which the presidential campaign of 1888 gave such notoriety: "I send you some of the most wonderful whiskey that ever drove the skeleton from a feast or painted landscapes in the brain of man. It is the mingled souls of wheat and corn. In it you will find the sunshine and shadow that chase each other over the billowy fields, the breath of June, the carol of the lark, the dews of the night, the wealth of summer, and autumn's rich content—all golden with imprisoned light. Drink it, and you will hear the voice of men and maidens singing the 'Harvest Home,' mingled with the laughter of children. Drink it, and you will feel within your blood the star-lit dawns, the dreamy, tawny dusks of many perfect days. For forty years this liquid joy has been within the happy staves of oak, longing to touch the lips of man."—It is in this way that I should reply to Mr. Gurney's criticism on my theory. My "view," this writer says (*Mind*, ix. 425), "goes far to confound the two things which in my opinion it is the prime necessity of musical psychology to distinguish—the effect chiefly sensuous of mere streams or masses of finely colored sound, and the distinctive musical emotion to which *the form* of a sequence of sound, its melodic and harmonic individuality, even realized in complete silence, is the vital and essential object. It is with the former of these two very different things that the physical reactions, the stirring of the hair—the tingling and the shiver—are by far most markedly connected.... If I may speak of myself, there is plenty of music from which I have received as much emotion in silent representation as when presented by the finest orchestra; but it is with the latter condition that I almost exclusively associate the cutaneous tingling and hair-stirring. But to call my enjoyment of the *form*, of the *note-after-noteness* of a melody a mere critical

'judgment of right' [see below, [p. 473](#)] would really be to deny to me the power of expressing a fact of simple and intimate expression in English. It is quintessentially emotion.... Now there are hundreds of other bits of music ... which I judge to be *right* without receiving an iota of the emotion. For purposes of emotion they are to me like geometrical demonstrations or like acts of integrity performed in Peru." The Beethoven-rightness of which Gurney then goes on to speak, as something different from the Clementi-rightness (even when the respective pieces are only heard in idea), is probably a purely *auditory-sensational* thing. The Clementi-rightness also; only, for reasons impossible to assign, the Clementi form does not give the same sort of purely auditory satisfaction as the Beethoven form, and might better be described perhaps negatively as *non-wrong*, i.e., free from positively unpleasant acoustic quality. In organizations as musical as Mr. Gurney's, purely acoustic form gives so intense a degree of sensible pleasure that the lower bodily reverberation is of no account. But I repeat that I see nothing in the facts which Mr. Gurney cites, to lead one to believe in an emotion divorced from *sensational processes* of any kind.

[417] In his chapter on 'Ideal Emotion,' to which the reader is referred for farther details on this subject.

[418] Those feelings which Prof. Bain calls 'emotions of relativity,' excitement of novelty, wonder, rapture of freedom, sense of power, hardly survive any repetition of the experience. But as the text goes on to explain, and as Goethe as quoted by Prof. Höffding says, this is because "the soul is inwardly grown larger without knowing it, and can no longer be filled by that first sensation. The man thinks that he has lost, but really he has gained. What he has lost in rapture, he has gained in inward growth." "It is," as Prof. Höffding himself adds, in a beautiful figure of speech, "with our virgin feelings, as with the first breath drawn by the new-born child, in which the lung expands itself so that it can never be emptied to the same degree again. No later breath can feel just like that first one." On this whole subject of emotional blunting, compare Höffding's *Psychologie*, vi. E., and Bain's *Emotions and Will*, chapter iv. of the first part.

[419] M. Fr. Paulhan, in a little work full of accurate observations of detail (*Les Phénomènes Affectifs et les Lois de leur Apparition*), seems to me rather to turn the truth upside down by his formula that emotions are due to an inhibition of impulsive tendencies. *One* kind of emotion, namely, uneasiness, annoyance, distress, does occur when any definite impulsive tendency is checked, and all of M. P.'s illustrations are drawn from this sort. The other emotions are themselves primary impulsive tendencies, of a diffusive sort (involving, as M. P. rightly says, a *multiplicité des phénomènes*); and just in proportion as more and more of these multiple tendencies are checked, and replaced by some few narrow forms of discharge, does the original emotion tend to disappear.

[420] A list of the older writings on the subject is given in Mantegazza's work, *La Physionomie et l'Expression*, chap. I; others in Darwin's first chapter. Bell's *Anatomy of Expression*, Mosso's *La Paura*, Piderit's *Wissenschaftliches System der Mimik und Physiognomik*, Duchenne's *Mécanisme de la Physionomie Humaine*, are, besides Lange and Darwin, the most useful works with which I am acquainted. Compare also Sully: *Sensation and Intuition*, chap. ii.

[421] One must remember, however, that just in so far forth as sexual selection may have played a part in determining the human organism, selection of expressive faces must have increased the average mobility of the human countenance.

[422] *Psychol.*, § 213.

[423] Weeping in childhood is almost as regular a symptom of anger as it is of grief, which would account (on Darwin's principles) for the frown of anger. Mr. Spencer has an account of the angry frown as having arisen through the survival of the fittest, by its utility in keeping the sun out of one's eyes when engaged in mortal combat(!). (*Principles of Psychology*, ii. 546.) Professor Mosso objects to any explanation of the frown by its utility for vision, that it is coupled, during emotional

excitement, with a dilatation of the pupil which is very unfavorable for distinct vision, and that this ought to have been weeded out by natural selection, if natural selection had the power to fix the frown (see *La Paura*, chap. ix. § vi). Unfortunately this very able author speaks as if all the emotions affected the pupil in the same way. Fear certainly does make it dilate. But Gratiolet is quoted by Darwin and others as saying that the pupils *contract* in anger. I have made no observations of my own on the point, and Mosso's earlier paper on the pupil (Turin, 1875) I have not seen. I must repeat, with Darwin, that we need more minute observations on this subject.

[424] *Physiologie u. Psychologie des Lachens und des Komischen* (Berlin, 1873), pp. 13, 15.

[425] These movements are explained teleologically, in the first instance, by the efforts which the tongue is forced to make to adapt itself to the better perception or avoidance of the sapid body. (Cf. *Physiol. Psych.*, ii. 423.)

[426] Professor Henle derives the negative wag of the head from an incipient shudder, and remarks how fortunate is the abbreviation, as when a lady declines a partner in the ball-room. The clapping of the hands for applause he explains as a symbolic abridgment of an embrace. The protrusion of the lips (*der prüfende Zug*) which goes with all sorts of dubious and questioning states of mind is derived by Dr. Piderit from the *tasting* movement which we can see on any one's mouth when deciding whether a wine is good or not.

[427] *Loc. cit.* § 497. Why a dog's face-muscles are not more mobile than they are Mr. Spencer fails to explain, as also why different stimuli should innervate these small muscles in such different ways, if easy drainage be the only principle involved. Charles Bell accounted for the special part played by the facial muscles in expression by their being *accessory muscles of respiration*, governed by nerves whose origin is close to the respiratory centre in the medulla oblongata. They are an adjuvant of *voice*, and like it their function is *communication*. (See Bell's *Anatomy of Expression*. Appendix by Alexander Shaw.)

[428] *La Paura*, Appendice, p. 295.

[429] See below, [p. 627](#).

CHAPTER XXVI.^[430]

WILL.

Desire, wish, will, are states of mind which everyone knows, and which no definition can make plainer. We desire to feel, to have, to do, all sorts of things which at the moment are not felt, had, or done. If with the desire there goes a sense that attainment is not possible, we simply *wish*; but if we believe that the end is in our power, we *will* that the desired feeling, having, or doing shall be real; and real it presently becomes, either immediately upon the willing or after certain preliminaries have been fulfilled.

The only ends which follow *immediately* upon our willing seem to be movements of our own bodies. Whatever *feelings* and *havings* we may will to get, come in as results of preliminary movements which we make for the purpose. This fact is too familiar to need illustration; so that we may start with the proposition that the only *direct* outward effects of our will are bodily movements. The mechanism of production of these voluntary movements is what befalls us to study now. The subject involves a good many separate points which it is difficult to arrange in any continuous logical order. I will treat of them successively in the mere order of convenience; trusting that at the end the reader will gain a clear and connected view.

The movements we have studied hitherto have been automatic and reflex, and (on the first occasion of their performance, at any rate) unforeseen by the agent. The movements to the study of which we now address ourselves, being desired and intended beforehand, are of course done with full prevision of what they are to be. It follows from this that *voluntary movements must be secondary, not primary functions of our organism*. This is the first point to understand in the psychology of Volition. Reflex, instinctive, and emotional movements are all primary performances. The nerve-centres are so organized that certain stimuli pull the trigger of certain explosive parts; and a creature going through one of these explosions for the first time undergoes an entirely novel experience. The other day I was standing at a railroad station with a little child, when an express-train went thundering by. The child, who was near the edge of the platform, started, winked, had his breathing convulsed, turned pale, burst out crying, and ran frantically towards me and hid his face. I have no doubt that this youngster was almost as much astonished by his own behavior as he was by the train, and more than I was, who stood by. Of course if such a reaction has many times occurred we learn what to expect of ourselves, and can then foresee our conduct, even though it remain as involuntary and uncontrollable as it was before. But if, in voluntary action properly so-called, the act must be foreseen, it follows that no creature not endowed with divinatory power can perform an act voluntarily for the first time. Well, we are no more endowed

with prophetic vision of what movements lie in our power, than we are endowed with prophetic vision of what sensations we are capable of receiving. As we must wait for the sensations to be given us, so we must wait for the movements to be performed involuntarily,^[431] before we can frame ideas of what either of these things are. We learn all our possibilities by the way of experience. When a particular movement, having once occurred in a random, reflex, or involuntary way, has left an image of itself in the memory, then the movement can be desired again, proposed as an end, and deliberately willed. But it is impossible to see how it could be willed before.

A supply of ideas of the various movements that are possible left in the memory by experiences of their involuntary performance is thus the first prerequisite of the voluntary life.

Now the same movement involuntarily performed may leave many different kinds of ideas of itself in the memory. If performed by another person, we of course *see* it, or we *feel* it if the moving part strikes another part of our own body. Similarly we have an auditory image of its effects if it produces sounds, as for example when it is one of the movements made in vocalization, or in playing on a musical instrument. All these *remote* effects of the movement, as we may call them, are also produced by movements which we ourselves perform; and they leave innumerable ideas in our mind by which we distinguish each movement from the rest. It *looks* distinct; it *feels* distinct to some distant part of the body which it strikes; or it *sounds* distinct. These remote effects would then, rigorously speaking, suffice to furnish the mind with the supply of ideas required.

But in addition to these impressions upon remote organs of sense, we have, whenever we perform a movement ourselves, another set of impressions, those, namely, which come up from the parts that are actually moved. These *kinaesthetic* impressions, as Dr. Bastian has called them, are so many *resident* effects of the motion. Not only are our muscles supplied with afferent as well as with efferent nerves, but the tendons, the ligaments, the articular surfaces, and the skin about the joints are all sensitive, and, being stretched and squeezed in ways characteristic of each particular movement, give us as many distinctive feelings as there are movements possible to perform.

It is by these resident impressions that we are made conscious of *passive movements*—movements communicated to our limbs by others. If you lie with closed eyes, and another person noiselessly places your arm or leg in any arbitrarily chosen attitude, you receive an accurate feeling of what attitude it is, and can immediately reproduce it yourself in the arm or leg of the opposite side. Similarly a man waked suddenly from sleep in the dark is aware of how he finds himself lying. At least this is what happens when the nervous apparatus is normal. But in cases of disease we sometimes find that the resident impressions do not normally excite the centres, and that then the sense of attitude is lost. It is only recently that pathologists have begun to study these anæsthesias with the delicacy which they require; and we have doubtless yet a great deal to learn about them. The skin may be anæsthetic, and the muscles may not feel the cramp-like pain which is produced by faradic currents sent through them, and yet the sense of passive movement may be retained. It seems, in fact, to persist more obstinately than the other forms of sensibility, for cases are comparatively common in which all the other feelings in the limb but this one of attitude are lost. In [Chapter XX](#) I have tried to make it appear that the articular surfaces are probably the most important source of the resident kinæsthetic feelings. But the determination of their special organ is indifferent to our present quest. It is enough to know that the existence of these feelings cannot be denied.

When the feelings of passive movement as well as all the other feelings of a limb are lost, we get such results as are given in the following account by Professor A. Strümpell of his wonderful anæsthetic boy, whose only sources of feeling were the right eye and the left ear:^[432]

"Passive movements could be imprinted on all the extremities to the greatest extent, without attracting the patient's notice. Only in violent forced hyperextension of the joints, especially of the knees, there arose a dull vague feeling of strain, but this was seldom precisely localized. We have often, after bandaging the eyes of the patient, carried him about the room, laid him on a table, given to his arms and legs the most fantastic and apparently the most inconvenient attitudes, without his having a suspicion of it. The expression of astonishment in his face, when all at once the removal of the handkerchief revealed his situation, is indescribable in words. Only when his head was made to hang away down he immediately spoke of dizziness, but could not

assign its ground. Later he sometimes inferred from the sounds connected with the manipulation that something special was being done with him.... He had no feelings of muscular fatigue. If, with his eyes shut, we told him to raise his arm and to keep it up, he did so without trouble. After one or two minutes, however, the arm began to tremble and sink without his being aware of it. He asserted still his ability to keep it up.... Passively holding still his fingers did not affect him. He thought constantly that he opened and shut his hand, whereas it was really fixed."

Or we read of cases like this:

"Voluntary movements cannot be estimated the moment the patient ceases to take note of them by his eyes. Thus, after having made him close his eyes, if one asks him to move one of his limbs either wholly or in part, he does it but cannot tell whether the effected movement is large or small, strong or weak, or even if it has taken place at all. And when he opens his eyes after moving his leg from right to left, for example, he declares that he had a very inexact notion of the extent of the effected movement.... If, having the intention of executing a certain movement, *I prevent him*, he does not perceive it, and supposes the limb to have taken the position he intended to give it."^[433]

Or this:

"The patient, when his eyes were closed in the middle of an unpractised movement, remained with the extremity in the position it had when the eyes closed and did not complete the movement properly. Then after some oscillations the limb gradually sank by reason of its weight (the sense of fatigue being absent). Of this the patient was not aware, and wondered, when he opened his eyes, at the altered position of his limb."^[434]

A similar condition can be readily reproduced experimentally in many hypnotic subjects. All that is needed is to tell a suitably predisposed person during the hypnotic trance that he cannot feel his limb, and he will be quite unaware of the attitudes into which you may throw it.^[435]

All these cases, whether spontaneous or experimental, show the absolute need of *guiding sensations* of some kind for the successful carrying out of a concatenated series of movements. It is, in fact, easy to see that, just as where the chain of movements is automatic (see above, Vol. I. p. 116), each later movement of the chain has to be discharged by the impression which the next earlier one makes in being executed, so also, where the chain is voluntary, we need to know at each movement just *where we are in it*, if we are to will intelligently what the next link shall be. A man with no feeling of his movements might lead off never so well, and yet be sure to get lost soon and go astray.^[436] But patients like those described, who get no kinæsthetic impressions, can still be guided by the sense of sight. Thus Strümpell says of his boy:

"One could always observe how his eye was directed first to the object held before him, then to his own arm; and how it never ceased to follow the latter during its entire movement. All his voluntary movements took place under the unremitting lead of the eye, which as an indispensable guide, was never untrue to its functions."

So in the Landry case:

"With his eyes open, he easily opposes the thumb to each of the other fingers; with his eyes closed, the movement of opposition occurs, but the thumb only by chance meets the finger which it seeks. With his eyes open he is able, without hesitation, to bring his two hands together; but when his eyes are closed his hands seek one another in space, and only meet by chance."

In Charles Bell's well-known old case of anæsthesia the woman could only hold her baby safely in her arms so long as she looked at it. I have myself reproduced a similar condition in two hypnotic subjects whose arm and hand were made anæsthetic without being paralyzed. They could write their names when looking, but not when their eyes were closed. The modern mode of teaching deaf mutes to articulate consists in making them attentive to certain laryngeal, labial, thoracic, and other sensations, the reproduction of which becomes a guide to their vocalization. Normally it is the remoter

sensations which we receive by the ear which keep us from going astray in our speech. The phenomena of aphasia show this to be the usual case.^[437]

This is perhaps all that need be said about the existence of passive sensations of movement and their indispensableness for our voluntary activity. We may consequently set it down as certain that, *whether or no there be anything else in the mind at the moment when we consciously will a certain act, a mental conception made up of memory-images of these sensations, defining which special act it is, must be there.*

Now *is there anything else in the mind when we will to do an act?* We must proceed in this chapter from the simpler to the more complicated cases. My first thesis accordingly is, that *there need be nothing else, and that in perfectly simple voluntary acts there is nothing else, in the mind but the kinæsthetic idea, thus defined, of what the act is to be.*

A powerful tradition in Psychology will have it that something additional to these images of passive sensation is essential to the mental determination of a voluntary act. There must, of course, be a special current of energy going out from the brain into the appropriate muscles during the act; and this outgoing current (it is supposed) must have in each particular case a feeling *sui generis* attached to it, or else (it is said) the mind could never tell which particular current, the current to this muscle or the current to that one, was the right one to use. This feeling of the current of outgoing energy has received from Wundt the name of the *feeling of innervation*. *I disbelieve in its existence, and must proceed to criticise the notion of it, at what I fear may to some prove tedious length.*

At first sight there is something extremely plausible in the feeling of innervation. The passive feelings of movement with which we have hitherto been dealing all come after the movement's performance. But wherever a movement is difficult and precise, we become, as a matter of fact, acutely aware *in advance* of the amount and direction of energy which it is to involve. One has only to play tenpins or billiards, or throw a ball, to catch his will in the act, as it were, of balancing tentatively its possible efforts, and ideally rehearsing various muscular contractions nearly correct, until it

gets just the right one before it, when it says 'Now go!' This premonitory weighing feels so much like a succession of tentative sallies forth of power into the outer world, followed by correction just in time to avoid the irrevocable deed, that the notion that *outgoing* nerve-currents rather than mere vestiges of former passive sensibility accompany it, is a most natural one to entertain.

We find accordingly that most authors have taken the existence of feelings of innervation as a matter of course. Bain, Wundt, Helmholtz, and Mach defend them most explicitly. But in spite of the authority which such writers deservedly wield, I cannot help thinking that they are in this instance wrong,—that the discharge into the motor nerves is insentient, and that *all our ideas of movement*, including those of the effort which it requires, as well as those of its direction, its extent, its strength, and its velocity, *are images of peripheral sensations, either 'remote,' or resident in the moving parts, or in other parts which sympathetically act with them in consequence of the 'diffusive wave.'*

A priori, as I shall show, there is no reason why there should be a consciousness of the motor discharge, and there is a reason why there should not be such a consciousness. The *presumption* is thus against the existence of the feeling of innervation; and the burden of proving it falls upon those who believe in it. If the positive empirical evidence which they offer prove also insufficient, then their case falls to the ground, and the feeling in question must be ruled out of court.

In the first place, then, let me show that *the assumption of the feeling of innervation is unnecessary*.

I cannot help suspecting that the scholastic prejudice that 'the effect must be already in some way *contained in* the cause' has had something to do with making psychologists so ready to admit the feeling of innervation. The outgoing current being the effect, what psychic antecedent could contain or prefigure it better than a feeling of it? But if we take a wide view, and consider the psychic antecedents of our activities at large, we see that the scholastic maxim breaks down everywhere, and that its verification in this

instance would rather violate than illustrate the general rule. In the diffusive wave, in reflex action, and in emotional expression, the movements which are the effects are in no manner contained by anticipation in the stimuli which are their cause. The latter are subjective sensations or objective perceptions, which do not in the slightest degree resemble or prefigure the movements. But we get them, and, presto! there the movements are! They are knocked out of us, they surprise us. It is just cause for wonder, as our chapter on Instinct has shown us, that such bodily consequences should follow such mental antecedents. We explain the mystery *tant bien que mal* by our evolutionary theories, saying that lucky variations and heredity have gradually brought it about that this particular pair of terms should have grown into a uniform sequence. Meanwhile why any state of consciousness *at all* should precede a movement, we know not—the two things seem so essentially discontinuous. But if a state of consciousness there must be, why then it may, for aught we can see, as easily be one sort of a state as another. It is swallowing a camel and straining at a gnat for a man (all of whose muscles will on certain occasions contract at a sudden touch or sound) to suppose that on another occasion the idea of the feelings about to be produced by their contraction is an insufficient mental signal for the latter, and to insist that an additional antecedent is needed in the shape of 'a feeling of the outgoing discharge.'

No! for aught we can see, and in the light of general analogy, the kinæsthetic ideas, as we have defined them, or images of incoming feelings of attitude and motion, are as *likely* as any feelings of innervation are, to be the last psychic antecedents and determiners of the various currents downwards into the muscles from the brain. The question "What *are* the antecedents and determinants?" is a question of fact, to be decided by whatever empirical evidence may be found.^[438]

But before considering the empirical evidence, let me go on to show that there is *a certain a priori reason why the kinæsthetic images OUGHT to be the last psychic antecedents of the outgoing currents, and why we should expect these currents to be insentient; why, in short, the soi-disant feelings of innervation should NOT exist.*

It is a general principle in Psychology that consciousness deserts all processes where it can no longer be of use. The tendency of consciousness to a minimum of complication is in fact a dominating law. The law of

parsimony in logic is only its best known case. We grow unconscious of every feeling which is useless as a sign to lead us to our ends, and where one sign will suffice others drop out, and that one remains, to work alone. We observe this in the whole history of sense-perception, and in the acquisition of every art. We ignore which eye we see with, because a fixed mechanical association has been formed between our motions and each retinal image. Our motions are the ends of our seeing, our retinal images the signals to these ends. If each retinal image, whichever it be, can suggest automatically a motion in the right direction, what need for us to know whether it be in the right eye or the left? That knowledge would be superfluous complication. So in acquiring any art or voluntary function. The marksman ends by thinking only of the exact position of the goal, the singer only of the perfect sound, the balancer only of the point of the pole whose oscillations he must counteract. The associated mechanism has become so perfect in all these persons that each variation in the thought of the end is functionally correlated with the one movement fitted to bring the latter about. Whilst they were tyros, they thought of their means as well as their end: the marksman of the position of his gun or bow, or the weight of his stone; the pianist of the visible position of the note on the keyboard; the singer of his throat or breathing; the balancer of his feet on the rope, or his hand or chin under the pole. But little by little they succeeded in dropping all this supernumerary consciousness, and they became secure in their movements exactly in proportion as they did so.

Now if we analyze the nervous mechanism of voluntary action, we shall see that by virtue of this principle of parsimony in consciousness the motor discharge *ought* to be devoid of sentience. If we call the immediate psychic antecedent of a movement the latter's *mental cue*, all that is needed for invariability of sequence on the movement's part is a *fixed connection* between each several mental cue, and one particular movement. For a movement to be produced with perfect precision, it suffices that it obey instantly its own mental cue and nothing else, and that this mental cue be incapable of awakening any other movement. Now the *simplest* possible arrangement for producing voluntary movements would be that the memory-images of the movement's distinctive peripheral effects, whether resident or remote,^[439] themselves should severally constitute the mental cues, and that no other psychic facts should intervene or be mixed up with them. For a million different voluntary movements, we should then need a

million distinct processes in the brain-cortex (each corresponding to the idea or memory-image of one movement), and a million distinct paths of discharge. Everything would then be unambiguously determined, and if the idea were right, the movement-would be right too. Everything *after* the idea might then be quite insentient, and the motor discharge itself could be unconsciously performed.

The partisans of the feeling of innervation, however, say that the motor discharge itself must be felt, and that it, and not the idea of the movement's distinctive effects, must be the proper mental cue. Thus the principle of parsimony is sacrificed, and all economy and simplicity are lost. For what can be gained by the interposition of this relay of feeling between the idea of the movement and the movement? Nothing on the score of economy of nerve-tracts; for it takes just as many of them to associate a million ideas of movement with a million motor centres, each with a specific feeling of innervation attached to its discharge, as to associate the same million ideas with a million insentient motor centres. And nothing on the score of precision; for the only conceivable way in which the feelings of innervation might further precision would be by giving to a mind whose idea of a movement was vague, a sort of halting stage with sharper imagery on which to collect its wits before uttering its *fiat*. But not only are the conscious discriminations between our kinæsthetic ideas much sharper than any one pretends the shades of difference between feelings of innervation to be, but even were this not the case, it is impossible to see how a mind with its idea vaguely conceived could tell out of a lot of *Innervationsgeföhle*, were they never so sharply differentiated, which one fitted that idea exactly, and which did not. A sharply conceived idea will, on the other hand, *directly* awaken a distinct movement as easily as it will awaken a distinct feeling of innervation. If feelings can go astray through vagueness, surely the fewer steps of feeling there are interposed the more securely we shall act. We ought then, on *a priori* grounds alone, to regard the *Innervationsgeföhle* as a pure encumbrance, and to presume that the peripheral ideas of movement are sufficient mental cues.

The presumption being thus against the feelings of innervation, those who defend their existence are bound to prove it by positive evidence. The evidence might be direct or indirect. If we could introspectively feel them as something plainly distinct from the peripheral feelings and ideas of

movement which nobody denies to be there, that would be evidence both direct and conclusive. Unfortunately it does not exist.

There is no introspective evidence of the feeling of innervation. Wherever we look for it and think we have grasped it, we find that we have really got a peripheral feeling or image instead—an image of the way in which we feel when the innervation is over, and the movement is in process of doing or is done. Our idea of raising our arm, for example, or of crooking our finger, is a sense, more or less vivid, of how the raised arm or the crooked finger feels. There is no other mental material out of which such an idea might be made. We cannot possibly have any idea of our ears' motion until our ears have moved; and this is true of every other organ as well.

Since the time of Hume it has been a commonplace in psychology that we are only conversant with the outward results of our volition, and not with the hidden inner machinery of nerves and muscles which are what it primarily sets at work.^[440] The believers in the feeling of innervation readily admit this, but seem hardly alive to its consequences. It seems to me that one immediate consequence ought to be to make us doubt the existence of the feeling in dispute. Whoever says that in raising his arm he is ignorant of how many muscles he contracts, in what order of sequence, and in what degrees of intensity, expressively avows a colossal amount of unconsciousness of the processes of motor discharge. Each separate muscle at any rate cannot have its distinct feeling of innervation. Wundt,^[441] who makes such enormous use of these hypothetical feelings in his psychologic construction of space, is himself led to admit that they have no differences of quality, but feel alike in all muscles, and vary only in their degrees of intensity. They are used by the mind as guides, not of *which* movement, but of *how strong* a movement, it is making, or shall make. But does not this virtually surrender their existence altogether?^[442]

For if anything be obvious to introspection it is that the degree of strength of our muscular contractions is completely revealed to us by afferent feelings coming from the muscles themselves and their insertions, from the vicinity of the joints, and from the general fixation of the larynx, chest, face, and body, in the phenomenon of effort, objectively considered. When a certain degree of energy of contraction rather than another is thought of by us, this complex aggregate of afferent feelings, forming the material of

our thought, renders absolutely precise and distinctive our mental image of the exact strength of movement to be made, and the exact amount of resistance to be overcome.

Let the reader try to direct his will towards a particular movement, and then notice what *constituted* the direction of the will. Was it anything over and above the notion of the different feelings to which the movement when effected would give rise? If we abstract from these feelings, will any sign, principle, or means of orientation be left by which the will may innervate the right muscles with the right intensity, and not go astray into the wrong ones? Strip off these images of result, and so far from leaving us with a complete assortment of directions into which our will may launch itself, you leave our consciousness in an absolute and total vacuum. If I will to write "Peter" rather than "Paul," it is the thought of certain digital sensations, of certain alphabetic sounds, of certain appearances on the paper, and of no others, which immediately precedes the motion of my pen.

If I will to utter the word *Paul* rather than *Peter*, it is the thought of my voice falling on my ear, and of certain muscular feelings in my tongue, lips, and larynx, which guide the utterance. All these are incoming feelings, and between the thought of them, by which the act is mentally specified with all possible completeness, and the act itself, there is no room for any third order of mental phenomenon. There is indeed the *fiat*, the element of consent, or resolve that the act shall ensue. This, doubtless, to the reader's mind, as to my own, constitutes the essence of the voluntariness of the act. This *fiat* will be treated of in detail farther on. It may be entirely neglected here, for it is a constant coefficient, affecting all voluntary actions alike, and incapable of serving to distinguish them. No one will pretend that its quality varies according as the right arm, for example, or the left is used.

An anticipatory image, then, of the sensorial consequences of a movement, plus (on certain occasions) the fiat that these consequences shall become actual, is the only psychic state which introspection lets us discern as the forerunner of our voluntary acts. There is no introspective evidence whatever of any still later or concomitant feeling attached to the efferent discharge. The various degrees of difficulty with which the fiat is given form a complication of the utmost importance, to be discussed farther on.

Now the reader may still shake his head and say: "But can you seriously mean that all the wonderfully exact adjustment of my action's strength to its ends is not a matter of outgoing innervation? Here is a cannon-ball, and here a pasteboard box: instantly and accurately I lift each from the table, the ball not refusing to rise because my innervation was too weak, the box not flying abruptly into the air because it was too strong. Could representations of the movement's different sensory effects in the two cases be so delicately foreshadowed in the mind? or being there, is it credible that they should, all unaided, so delicately graduate the stimulation of the unconscious motor centres to their work?" Even so! I reply to both queries. We have a most extremely delicate foreshadowing of the sensory effects. Why else the start of surprise that runs through us if some one has filled the light-seeming box with sand before we try to lift it, or has substituted for the cannon-ball which we know a painted wooden imitation? *Surprise* can only come from getting a sensation which differs from the one we expect. But the truth is that when we know the objects well, the very slightest difference from the expected weight will surprise us, or at least attract our notice. With unknown objects we begin by expecting the weight made probable by their appearance. The expectation of this sensation innervates our lift, and we 'set' it rather small at first. An instant verifies whether it is too small. Our expectation rises, i.e., we think in a twinkling of a setting of the chest and teeth, a bracing of the back, and a more violent feeling in the arms. Quicker than thought we have them, and with them the burden ascends into the air. [443] Bernhardt^[444] has shown in a rough experimental way that our estimation of the amount of a resistance is as delicately graduated when our wills are passive, and our limbs made to contract by direct local faradization, as when we ourselves innervate them. Ferrier^[445] has repeated and verified the observations. They admit of no great precision, and too much stress should not be laid upon them either way; but at the very least they tend to show that no added delicacy would accrue to our perception from the consciousness of the efferent process, even if it existed.

Since there is no direct introspective evidence for the feelings of innervation, is there any indirect or circumstantial evidence? Much is offered; but on critical examination it breaks down. Let us see what it is. Wundt says that were our motor feelings of an afferent nature,

"it ought to be expected that they would increase and diminish with the amount of outer or inner work actually effected in contraction. This, however, is not the case, but the strength of the motor sensation is purely proportional to the strength of the *impulse* to movement, which starts from the central organ innervating the motor nerves. This may be proved by observations made by physicians in cases of morbid alteration in the muscular effect. A patient whose arm or leg is half paralyzed, so that he can only move the limb with great effort, has a distinct feeling of this effort: the limb seems to him heavier than before, appearing as if weighted with lead; he has, therefore, a sense of more work effected than formerly, and yet the effected work is either the same or even less. Only he must, to get even this effect, exert a stronger innervation, a stronger motor impulse, than formerly."^[446]

In complete paralysis, also, patients will be conscious of putting forth the greatest exertion to move a limb which remains absolutely still upon the bed, and from which of course no afferent muscular or other feelings can come.^[447]

But Dr. Ferrier in his *Functions of the Brain* (Am. Ed. pp. 222-4) disposes very easily of this line of argument. He says:

"It is necessary, however, to exclude movements *altogether* before such an explanation [as Wundt's] can be adopted. Now, though the hemiplegic patient cannot move his paralyzed limb, though he is conscious of trying hard, yet he will be found to be making powerful muscular exertion of some kind. Vulpian has called attention to the fact, and I have repeatedly verified it, that when a hemiplegic patient is desired to close his paralyzed fist, in his endeavors to do so he unconsciously performs this action with the sound one. It is, in fact, almost impossible to exclude such a source of complication, and unless this is taken into account very erroneous conclusions as to the cause of the sense of effort may be drawn. In the fact of muscular contraction and the concomitant centripetal impressions, even though the action is not such as is desired, the conditions of the consciousness of effort exist without our being obliged to regard it as depending on central innervation or outgoing currents.

"It is, however, easy to make an experiment of a simple nature which will satisfactorily account for the sense of effort, even when these unconscious contractions of the other side, such as hemiplegics make, are entirely excluded.

"If the reader will extend his right arm and hold his forefinger in the position required for pulling the trigger of a pistol, he may without actually moving his finger, but by simply making believe, experience a consciousness of energy put forth. Here, then, is a clear case of consciousness of energy without actual contraction of the muscles either of the one hand or the other, and without any perceptible bodily strain. If the reader will again perform the experiment, and pay careful attention to the condition of his respiration, he will observe that his consciousness of effort coincides with a fixation of the muscles of his chest, and that in proportion to the amount of energy he feels he is putting forth, he is keeping his glottis closed and actively contracting his respiratory muscles. Let him place his finger as before, and *continue breathing* all the time, and he will find that however much he may direct his attention to his finger, he will experience not the slightest trace of consciousness of effort until he has actually moved the finger itself, and then it is referred locally to the muscles in action. It is only when this essential and ever-present respiratory factor is, as it has been, overlooked, that the consciousness of effort can with any degree of plausibility be ascribed to the outgoing current. In the contraction of the respiratory muscles there are the necessary conditions of centripetal impressions, and these are capable of originating the general sense of effort. When these active efforts are withheld, no consciousness of effort ever arises, except in so far as it is conditioned by the local contraction of the group of muscles towards which the attention is directed, or by other muscular contractions called unconsciously into play in the attempt.

"I am unable to find a single case of consciousness of effort which is not explicable in one or other of the ways specified. In all instances the consciousness of effort is conditioned by the actual fact of muscular contraction. That it is dependent on centripetal impressions generated by the act of contraction, I have already endeavored to show. When the paths of the centripetal impressions or the cerebral centres of the same

are destroyed, there is no vestige of a muscular sense. That the central organs for the apprehension of the impressions originating from muscular contraction are different from those which send out the motor impulse, has already been established. But when Wundt argues that this cannot be so, because then the sensation would always keep pace with the energy of muscular contraction, he overlooks the important factor of the fixation of the respiratory muscles, which is the basis of the general sense of effort in all its varying degrees."

To these remarks of Ferrier's I have nothing to add.^[448] Any one may verify them, and they prove conclusively that the consciousness of muscular exertion, being impossible without movement *effected somewhere*, must be an afferent and not an efferent sensation; a consequence, and not an antecedent, of the movement itself. An idea of the amount of muscular exertion requisite to perform a certain movement can consequently be nothing other than an anticipatory image of the movement's sensible effects.

Driven thus from the body at large, where next shall the circumstantial evidence for the feeling of innervation lodge itself? Where but in the muscles of the eye, from which small retreat it judges itself inexpugnable. Nevertheless, that fastness too must fall, and by the lightest of bombardments. But, before trying the bombardment, let us recall our general principles about optical vertigo, or illusory appearance of movement in objects.

We judge that an object moves under two distinct sets of circumstances:

1. When its image moves on the retina, and we know that the eye is still.
2. When its image is stationary on the retina, and we know that the eye is moving. In this case we feel that we *follow* the object.

In either of these cases a mistaken judgment about the state of the eye will produce optical vertigo.

If in case 1 we think our eye is still when it is really moving, we get a movement of the retinal image which we judge to be due to a real outward motion of the object. This is what happens after looking at rushing water, or through the windows of a moving railroad car, or after turning on one's heel to giddiness. The eyes, without our intending to move them, go through a

series of involuntary rotations, continuing those they were previously obliged to make to keep objects in view. If the objects had been whirling by to our right, our eyes when turned to stationary objects will still move slowly towards the right. The retinal image upon them will then move like that of an object passing to the left. We then try to catch it by voluntarily and rapidly rotating the eyes to the left, when the involuntary impulse again rotates the eyes to the right, continuing the apparent motion; and so the game goes on. (See above, [pp. 89-91.](#))

If in case 2 we think our eyes moving when they are in reality still, we shall judge that we are following a moving object when we are but fixating a steadfast one. Illusions of this kind occur after sudden and complete paralysis of special eye muscles, and the partisans of feelings of efferent innervation regard them as *experimenta crucis*. Helmholtz writes:^[449]

"When the external rectus muscle of the right eye, or its nerve, is paralyzed, the eye can no longer be rotated to the right side. So long as the patient turns it only to the nasal side it makes regular movements, and he perceives correctly the position of objects in the visual field. So soon, however, as he tries to rotate it outwardly, i.e., towards the right, it ceases to obey his will, stands motionless in the middle of its course, and the objects appear flying to the right, although position of eye and retinal image are unaltered."^[450]

"In such a case the exertion of the will is followed neither by actual movement of the eye, nor by contraction of the muscle in question, nor even by increased tension in it. The act of will *produced absolutely no effect* beyond the nervous system, and yet we judge of the direction of the line of vision as if the will had exercised its normal effects. We believe it to have moved to the right, and since the retinal image is unchanged, we attribute to the object the same movement we have erroneously ascribed to the eye.... These phenomena leave no room for doubt that we only judge the direction of the line of sight by the effort of will with which we strive to change the position of our eyes. There are also certain weak feelings in our eyelids,... and furthermore in excessive lateral rotations we feel a fatiguing strain in the muscles. But all these feelings are too faint and vague to be of use in the perception

of direction. We feel then what impulse of the will, and how strong a one, we apply to turn our eye into a given position."

Partial paralysis of the same muscle, *paresis*, as it has been called, seems to point even more conclusively to the same inference, that the will to innervate is felt independently of all its afferent results. I will quote the account given by a recent authority,^[451] of the effects of this accident:

"When the nerve going to an eye muscle, e.g., the external rectus of one side, falls into a state of paresis, the first result is that the same volitional stimulus, which under normal circumstances would have perhaps rotated the eye to its extreme position outwards, now is competent to effect only a moderate outward rotation, say of 20°. If now, shutting the sound eye, the patient looks at an object situated just so far outwards from the paretic eye that this latter must turn 20° in order to see it distinctly, the patient will feel as if he had moved it not only 20° towards the side, but into its extreme lateral position, for the impulse of innervation requisite for bringing it into view is a perfectly conscious act, whilst the diminished state of contraction of the paretic muscle lies for the present out of the ken of consciousness. The test proposed by von Graefe, of localization by the sense of touch, serves to render evident the error which the patient now makes. If we direct him to touch rapidly the object looked at, with the forefinger of the hand of the same side, the line through which the finger moves will not be the line of sight directed 20° outward, but will approach more nearly to the extreme possible outward line of vision."

A stone-cutter with the external rectus of the left eye paralyzed, will strike his hand instead of his chisel with his hammer, until experience has taught him wisdom.

It appears as if here the judgment of direction *could* only arise from the excessive innervation of the rectus when the object is looked at. All the afferent feelings must be identical with those experienced when the eye is sound and the judgment is correct. The eyeball is rotated just 20° in the one case as in the other, the image falls on the same part of the retina, the pressures on the eyeball and the tensions of the skin and conjunctiva are identical. There is only one feeling which *can* vary, and lead us to our

mistake. That feeling must be the effort which the will makes, moderate in the one case, excessive in the other, but in both cases an efferent feeling, pure and simple.

Beautiful and clear as this reasoning seems to be, it is based on an incomplete inventory of the afferent data. The writers have all omitted to consider what is going on in the *other eye*. This is kept covered during the experiments, to prevent double images, and other complications. But if its condition under these circumstances be examined, it will be found to present changes which must result in strong afferent feelings. And the taking account of these feelings demolishes in an instant all the conclusions which the authors from whom I have quoted base upon their supposed absence. This I will now proceed to show.^[452]

Take first the case of complete paralysis and assume the right eye affected. Suppose the patient desires to rotate his gaze to an object situated in the extreme right of the field of vision. As Hering has so beautifully shown, both eyes move by a common act of innervation, and in this instance both move towards the right. But the paralyzed right eye stops short in the middle of its course, the object still appearing far to the sight of its fixation point. The left sound eye, meanwhile, although covered, continues its rotation until the extreme rightward limit thereof has been reached. To an observer looking at both eyes the left will seem to squint. Of course this continued and extreme rotation produces afferent feelings of rightward motion in the eyeball, which momentarily overpower the faint feelings of central position in the diseased and uncovered eye. The patient feels by his left eyeball as if he were following an object which by his right retina he perceives he does not overtake. All the conditions of optical vertigo are here present: the image stationary on the retina, and the erroneous conviction that the eyes are moving.

The objection that a feeling in the left eyeball ought not to produce a conviction that the right eye moves, will be considered in a moment. Let us meanwhile turn to the case of simple paresis with apparent translocation of the field.

Here the right eye succeeds in fixating the object, but observation of the left eye will reveal to an observer the fact that it squints just as violently inwards as in the former case. The direction which the finger of the patient

takes in pointing to the object, is the direction of this squinting and covered left eye. As Graefe says (although he fails to seize the true import of his own observation), "It appears to have been by no means sufficiently noticed how significantly the direction of the line of sight of the secondarily deviating eye [i.e., of the left,] and the line of direction of the pointed finger agree."

The translocation would, in a word, be perfectly explained could we suppose that the sensation of a certain degree of rotation in the left eyeball were able to suggest to the patient the position of an object whose image falls on the right retina alone.^[453] Can, then, a feeling in one eye be confounded with a feeling in the other? It most assuredly can, for not only Donders and Adamük, by their vivisections, but Hering by his exquisite optical experiments, have proved that the apparatus of innervation for both eyes is single, and that they function as one organ—a double eye, according to Hering, or what Helmholtz calls a *Cyclopenauge*. The retinal feelings of this double organ, singly innervated, are naturally undistinguished as respects our knowing whether they belong to the left retina or to the right. We use them only to tell us where their objects lie. It takes long practice directed specially *ad hoc* to teach us on which retina the sensations severally fall. Similarly the different sensations which arise from the positions of the eyeballs are used exclusively as signs of the position of objects; an object directly fixated being localized habitually at the intersection of the two optical axes, but without any separate consciousness on our part that the position of one axis is different from another. All we are aware of is a consolidated feeling of a certain 'strain' in the eyeballs, accompanied by the perception that just so far in front and so far to the right or to the left there is an object which we see. So that a 'muscular' process in one eye is as likely to combine with a retinal process in the other eye to effect a perceptive judgment, as two processes in one eye are likely so to combine.

Another piece of circumstantial evidence for the feelings of innervation is that adduced by Professor Mach, as follows:

"If we stand on a bridge, and look at the water flowing beneath, we usually feel ourselves at rest, whilst the water seems in motion. Prolonged looking at the water, however, commonly has for its result to make the bridge with the observer and surroundings suddenly seem to move in the direction opposed to that of the water, whilst the water itself assumes the appearance of standing still. The *relative* motion of the objects is in both cases the same, and there must therefore be some adequate *physiological* ground why sometimes one, sometimes the other part of them is felt to move. In order to investigate the matter conveniently, I had the simple apparatus constructed which is represented in Fig. 86. An oil-cloth with a simple pattern is horizontally stretched over two cylinders (each 2 metres long and 3 feet apart) and kept in uniform motion by the help of a crank. Across the cloth, and some 30 cm. above it, is stretched a string, with a knot *x*, which serves as a fixation-point for the eye of the observer. If the observer *follow* with his eyes the pattern of the cloth as it moves, he sees it in movement, himself and the surroundings at rest. But if he looks at the *knot*, he soon feels as if the entire room were moving contrary to the direction of the cloth, whilst the latter seems to stand still. This change in the mode of looking comes about in more or less time according to one's momentary disposition, but usually it takes but a few seconds. If one once understands the point, one can make the two appearances alternate at will. Every following of the oil-cloth makes the observer stationary; every fixation of the knot or *inattention to the oil-cloth, so that its pattern becomes blurred,*, sets him in apparent motion."^[454]

Professor Mach proceeds to explain the phenomenon as follows:

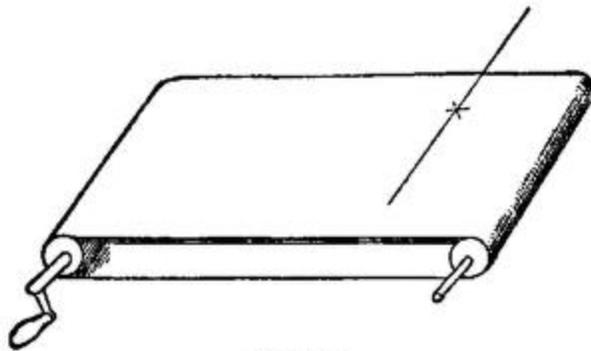


FIG. 86.

"Moving objects exert, as is well known, a peculiar motor stimulation upon the eye, they draw our attention and our look after them. If the look really follows them ... we assume that they move. But if the eye, instead of following the moving objects, remains steadfastly at rest, it must be that the constant stimulus to motion which it receives is neutralized by an equally constant current of innervation flowing into its motor apparatus. But this is just what would happen if the steadfastly fixated point were itself moving uniformly in the other direction, and we were following it with our eyes. When this comes about, whatever motionless things are looked at must appear in motion."^[455]

The knot *x*, the string, we ourselves, and all our stationary surroundings thus appear in movement, according to Mach, because we are constantly innervating our eyeballs to resist the *drag* exerted upon them by the pattern or the flowing waves. I have myself repeated the observation many times above flowing streams, but have never succeeded in getting the full illusion as described by Mach. I gain a sense of the movement of the bridge and of my own body, but the river never seems absolutely to stop: it still moves in one direction, whilst I float away in the other. But, be the illusion partial or complete, a different explanation of it from Professor Mach's seems to me the more natural one to adopt. The illusion is said to cease when, our attention being fully fixed on the moving oil-cloth, we perceive the latter for what it is; and to recommence, on the contrary, when we perceive the oil-cloth as a vaguely moving background behind an object which we

directly fixate and whose position with regard to our own body is unchanged. This, however, is the sort of consciousness which we have whenever we are ourselves borne in a vehicle, on horseback, or in a boat. As we and our belongings go one way, the *whole background* goes the other. I should rather, therefore, explain Professor Mach's illusion as similar to the illusion at railroad-stations described above on [page 90](#). The other train moves, but it makes ours seem to move, because, filling the window as it does, it stands for the time being as the total background. So here, the water or oil-cloth stands for us as background *überhaupt* whenever we seem to ourselves to be moving over it. The relative motion felt by the retina is assigned to that one of its components which we look at more in itself and less as a mere *repoussoir*. This may be the knot above the oil-cloth or the bridge beneath our feet, or it may be, on the other hand, the oil-cloth's pattern or the surface of the swirling stream. Similar changes may be produced in the apparent motion of the moon and the clouds through which it shines, by similarly altering the attention. Such alterations, however, in our conception of which part of the visual field is substantive object and which part background, seem to have no connection with feelings of innervation. I cannot, therefore, regard the observation of Prof. Mach as any proof that the latter feelings exist.^[456]

The circumstantial evidence for the feeling of innervation thus seems to break down like the introspective evidence. But not only can we rebut experiments intended to prove it, we can also adduce experiments which disprove it. A person who moves a limb voluntarily must innervate it in any case, and if he feels the innervation he ought to be able to use the feeling to define what his limb is about, even though the limb itself were anæsthetic. If, however, the limb be totally anæsthetic, it turns out that he does not know at all how much work it performs in its contraction—in other words, he has no perception of the amount of innervation which he exerts. A patient examined by Messrs. Gley and Marillier beautifully showed this. His entire arms, and his trunk down to the navel, were insensible both superficially and deeply, but his arms were not paralyzed:

"We take three stone bottles—two of them are empty and weigh each 350 grams; the third is full of mercury and weighs 1850 grams. We ask L... to estimate their weight and tell us which is heaviest. He declares that he finds them all three alike. With many days of interval we made two series of six experiments each. The result was always the same. The experiment, it need hardly be said, was arranged in such wise that he could be informed neither by sight nor by hearing. He even declared, holding in his hand the bottleful of mercury, that he found it to have no weight.... We place successively in his hand (his eyes being still bandaged) a piece of modelling wax, a stick of hard wood, a thick India-rubber tube, a newspaper folded up lengthwise and rumped, and we make him squeeze these several objects. He feels no difference of resistance and does not even perceive that anything is in his hand."^[457]

M. Gley in another place^[458] quotes experiments by Dr. Bloch which prove that the sense which we have of our limbs' position owes absolutely nothing to the feeling of innervation put forth. Dr. Bloch stood opposite the angle of a screen whose sides made an angle of about 90°, and tried to place his hands symmetrically, or so that both should fall on corresponding spots of the two screen-sides, which were marked with squares for the purpose. The average error being noted, one hand was then passively carried by an assistant to a spot on its screen-side, and the other actively sought the corresponding spot on the opposite side. The accuracy of the correspondence proved to be as great as when both arms were innervated voluntarily, showing that the consciousness of innervation in the first of the two experiments added nothing to the sense of the limbs' position. Dr. Bloch then tried, pressing a certain number of pages of a book between the thumb and forefinger of one hand, to press an equal number between the same fingers of the other hand. He did this just as well when the fingers in question were drawn apart by India-rubber bands as when they were uninterfered with, showing that the physiologically much greater innervation-current required in the former case had no effect upon the consciousness of the movement made, so far as its spatial character at any rate was concerned.^[459]

On the whole, then, it seems as probable as anything can well be, that these feelings of innervation do not exist. If the motor cells are distinct structures,

they are as insentient as the motor nerve-trunks are after the posterior roots are cut. If they are not distinct structures, but are only the last sensory cells, those at the 'mouth of the funnel,'^[460] then their consciousness is that of kinæsthetic ideas and sensations merely, and this consciousness accompanies the rise of activity in them rather than its discharge. The entire content and material of our consciousness—consciousness of movement, as of all things else—is thus of peripheral origin, and came to us in the first instance through the peripheral nerves. If it be asked what we gain by this sensationalistic conclusion, I reply that we gain at any rate simplicity and uniformity. In the chapters on Space, on Belief, on the Emotions, we found sensation to be a much richer thing than is commonly supposed; and this chapter seems at this point to fall into line with those. Then, as for sensationalism being a degrading belief, which abolishes all inward originality and spontaneity, there is this to be said, that the advocates of inward spontaneity may be turning their backs on its real citadel, when they make a fight, on its behalf, for the consciousness of energy put forth in the outgoing discharge. Let there be no such consciousness; let all our thoughts of movements be of sensational constitution; still in the emphasizing, choosing, and espousing of one of them rather than another, in the saying to it, 'be thou the reality for me,' there is ample scope for our inward initiative to be shown. Here, it seems to me, the true line between the passive materials and the activity of the spirit should be drawn. It is certainly false strategy to draw it between such ideas as are connected with the outgoing and such as are connected with the incoming neural wave.^[461]

If the ideas by which we discriminate between one movement and another, at the instant of deciding in our mind which one we shall perform, are always of sensorial origin, then the question arises, "Of which sensorial order need they be?" It will be remembered that we distinguished two orders of kinæsthetic impression, the *remote* ones, made by the movement on the eye or ear or distant skin, etc., and the *resident* ones, made on the moving parts themselves, muscles, joints, etc. Now do resident images, exclusively, form what I have called the mental cue, or will remote ones equally suffice?

There can be no doubt whatever that the mental cue may be either an image of the resident or of the remote kind. Although, at the outset of our learning a movement, it would seem that the resident feelings must come strongly before consciousness (cf. [p. 487](#)), later this need not be the case. The rule, in fact, would seem to be that they tend to lapse more and more from consciousness, and that the more practised we become in a movement, the more 'remote' do the ideas become which form its mental cue. What we are *interested* in is what sticks in our consciousness; everything else we get rid of as quickly as we can. Our resident feelings of movement have no substantive interest for us at all, as a rule. What interest us are the ends which the movement is to attain. Such an end is generally an outer impression on the eye or ear, or sometimes on the skin, nose, or palate. Now let the idea of the end associate itself definitely with the right motor innervation, and the thought of the innervation's *resident* effects will become as great an encumbrance as we formerly concluded that the feeling of the innervation itself would be. The mind does not need it; the end alone is enough.

The idea of the end, then, tends more and more to make itself all-sufficient. Or, at any rate, if the kinæsthetic ideas are called up at all, they are so swamped in the vivid kinæsthetic feelings by which they are immediately overtaken that we have no time to be aware of their separate existence. As I write, I have no anticipation, as a thing distinct from my sensation, of either the look or the digital feel of the letters which flow from my pen. The words chime on my mental *ear*, as it were, before I write them, but not on my mental eye or hand. This comes from the rapidity with which often-repeated movements follow on their mental cue. An end consented to as soon as conceived innervates directly the centre of the first movement of the chain which leads to its accomplishment, and then the whole chain rattles off *quasi-reflexly*, as was described on pp. 115-6 of Vol. I.

The reader will certainly recognize this to be true in all fluent and unhesitating voluntary acts. The only special fiat there is at the outset of the performance. A man says to himself, "I must change my shirt," and involuntarily he has taken off his coat, and his fingers are at work in their accustomed manner on his waistcoat-buttons, etc.; or we say, "I must go downstairs," and ere we know it we have risen, walked, and turned the handle of the door;—all through the idea of an end coupled with a series of

guiding sensations which successively arise. It would seem indeed that we fail of accuracy and certainty in our attainment of the end whenever we are preoccupied with much ideal consciousness of the means. We walk a beam the better the less we think of the position of our feet upon it. We pitch or catch, we shoot or chop the better the less tactile and muscular (the less resident), and the more exclusively optical, (the more remote) our consciousness is. Keep your *eye* on the place aimed at, and your hand will fetch it; think of your hand, and you will very likely miss your aim. Dr. Southard found that he could touch a spot with a pencil-point more accurately with a visual than with a tactile mental cue. In the former case he looked at a small object and closed his eyes before trying to touch it. In the latter case he *placed* it with closed eyes, and then after removing his hand tried to touch it again. The average error with touch (when the results were most favorable) was 17.13 mm. With sight it was only 12.37 mm.^[462]—All these are plain results of introspection and observation. By what neural machinery they are made possible we need not, at this present stage, inquire.

In [Chapter XVIII](#) we saw how enormously individuals differ in respect to their mental imagery. In the type of imagination called *tactile* by the French authors, it is probable that the kinæsthetic ideas are more prominent than in my account. We must not expect too great a uniformity in individual accounts, nor wrangle overmuch as to which one 'truly' represents the process.^[463]

I trust that I have now made clear what that 'idea of a movement' is which must precede it in order that it be voluntary. It is not the thought of the innervation which the movement requires. It is the anticipation of the movement's sensible effects, resident or remote, and sometimes very remote indeed. Such anticipations, to say the least, determine *what* our movements shall be. I have spoken all along as if they also might determine *that* they shall be. This, no doubt, has disconcerted many readers, for it certainly seems as if a special fiat, or consent to the movement were required in addition to the mere conception of it, in many cases of volition; and this fiat I have altogether left out of my account. This leads us to the next point in the psychology of the Will. It can be the more easily treated now that we have got rid of so much tedious preliminary matter.

IDEO-MOTOR ACTION.

The question is this: *Is the bare idea of a movement's sensible effects its sufficient mental cue (p. 497), or must there be an additional mental antecedent, in the shape of a fiat, decision, consent, volitional mandate, or other synonymous phenomenon of consciousness, before the movement can follow?*

I answer: Sometimes the bare idea is sufficient, but sometimes an additional conscious element, in the shape of a fiat, mandate, or express consent, has to intervene and precede the movement. The cases without a fiat constitute the more fundamental, because the more simple, variety. The others involve a special complication, which must be fully discussed at the proper time. For the present let us turn to *ideo-motor action*, as it has been termed, or the sequence of movement upon the mere thought of it, as the type of the process of volition.

Wherever movement follows *unhesitatingly and immediately* the notion of it in the mind, we have ideo-motor action. We are then aware of nothing between the conception and the execution. All sorts of neuro-muscular processes come between, of course, but we know absolutely nothing of them. We think the act, and it is done; and that is all that introspection tells us of the matter. Dr. Carpenter, who first used, I believe, the name of ideo-motor action, placed it, if I mistake not, among the curiosities of our mental life. The truth is that it is no curiosity, but simply the normal process stripped of disguise. Whilst talking I become conscious of a pin on the floor, or of some dust on my sleeve. Without interrupting the conversation I brush away the dust or pick up the pin. I make no express resolve, but the mere perception of the object and the fleeting notion of the act seem of themselves to bring the latter about. Similarly, I sit at table after dinner and find myself from time to time taking nuts or raisins out of the dish and eating them. My dinner properly is over, and in the heat of the conversation I am hardly aware of what I do, but the perception of the fruit and the fleeting notion that I may eat it seem fatally to bring the act about. There is certainly no express fiat here; any more than there is in all those habitual goings and comings and rearrangements of ourselves which fill every hour of the day, and which incoming sensations instigate so immediately that it is often difficult to decide whether not to call them reflex rather than

voluntary acts. We have seen in Chapter IV that the intermediary terms of an habitual series of acts leading to an end are apt to be of this *quasi-automatic* sort. As Lotze says:

"We see in writing or piano-playing a great number of very complicated movements following quickly one upon the other, the instigative representations of which remained scarcely a second in consciousness, certainly not long enough to awaken any other volition than the general one of resigning one's self without reserve to the passing over of representation into action. All the acts of our daily life happen in this wise: Our standing up, walking, talking, all this never demands a distinct impulse of the will, but is adequately brought about by the pure flux of thought."^[464]

In all this the determining condition of the unhesitating and resistless sequence of the act seems to be *the absence of my conflicting notion in the mind*. Either there is nothing else at all in the mind, or what is there does not conflict. The hypnotic subject realizes the former condition. Ask him what he is thinking about, and ten to one he will reply 'nothing.' The consequence is that he both believes everything he is told, and performs every act that is suggested. The suggestion may be a vocal command, or it may be the performance before him of the movement required. Hypnotic subjects in certain conditions repeat whatever they hear you say, and imitate whatever they see you do. Dr. Féré says that certain waking persons of neurotic type, if one repeatedly close and open one's hand before their eyes, soon begin to have corresponding feelings in their own fingers, and presently begin irresistibly to execute the movements which they see. Under these conditions of 'preparation' Dr. Féré found that his subjects could squeeze the hand-dynamometer much more strongly than when abruptly invited to do so. A few *passive* repetitions of a movement will enable many enfeebled patients to execute it actively with greater strength. These observations beautifully show how the mere quickening of kinæsthetic ideas is equivalent to a certain amount of tension towards discharge in the centres.^[465]

We know what it is to get out of bed on a freezing morning in a room without a fire, and how the very vital principle within us protests against the ordeal. Probably most persons have lain on certain mornings for an hour at a time unable to brace themselves to the resolve. We think how late we shall be, how the duties of the day will suffer; we say, "I *must* get up, this is ignominious," etc.; but still the warm couch feels too delicious, the cold outside too cruel, and resolution faints away and postpones itself again and again just as it seemed on the verge of bursting the resistance and passing over into the decisive act. Now how do we *ever* get up under such circumstances? If I may generalize from my own experience, we more often than not get up without any struggle or decision at all. We suddenly find that we *have* got up. A fortunate lapse of consciousness occurs; we forget both the warmth and the cold; we fall into some revery connected with the day's life, in the course of which the idea flashes across us, "Hollo! I must lie here no longer"—an idea which at that lucky instant awakens no contradictory or paralyzing suggestions, and consequently produces immediately its appropriate motor effects. It was our acute consciousness of both the warmth and the cold during the period of struggle, which paralyzed our activity then and kept our idea of rising in the condition of *wish* and not of *will*. The moment these inhibitory ideas ceased, the original idea exerted its effects.

This case seems to me to contain in miniature form the data for an entire psychology of volition. It was in fact through meditating on the phenomenon in my own person that I first became convinced of the truth of the doctrine which these pages present, and which I need here illustrate by no farther examples.^[466] The reason why that doctrine is not a self-evident truth is that we have so many ideas which *do not* result in action. But it will be seen that in every such case, without exception, that is because other ideas simultaneously present rob them of their impulsive power. But even here, and when a movement is inhibited from *completely* taking place by contrary ideas, it will *incipiently* take place. To quote Lotze once more:

"The spectator accompanies the throwing of a billiard-ball, or the thrust of the swordsman, with slight movements of his arm; the untaught narrator tells his story with many gesticulations; the reader while absorbed in the perusal of a battle-scene feels a slight tension run through his muscular system, keeping time as it were with the

actions he is reading of. These results become the more marked the more we are absorbed in thinking of the movements which suggest them; they grow fainter exactly in proportion as a complex consciousness, under the dominion of a crowd of other representations, withstands the passing over of mental contemplation into outward action."

The 'willing-game,' the exhibitions of so-called 'mind-reading,' or more properly muscle-reading, which have lately grown so fashionable, are based on this incipient obedience of muscular contraction to idea, even when the deliberate intention is that no contraction shall occur.^[467]

We may then lay it down for certain that *every representation of a movement awakens in some degree the actual movement which is its object; and awakens it in a maximum degree whenever it is not kept from so doing by an antagonistic representation present simultaneously to the mind.*

The express fiat, or act of mental consent to the movement, comes in when the neutralization of the antagonistic and inhibitory idea is required. But that there is no express fiat needed when the conditions are simple, the reader ought now to be convinced. Lest, however, he should still share the common prejudice that voluntary action without 'exertion of will-power' is Hamlet with the prince's part left out, I will make a few farther remarks. The first point to start from in understanding voluntary action, and the possible occurrence of it with no fiat or express resolve, is the fact that consciousness is *in its very nature impulsive*.^[468] We do not have a sensation or a thought and then have to *add* something dynamic to it to get a movement. Every pulse of feeling which we have is the correlate of some neural activity that is already on its way to instigate a movement. Our sensations and thoughts are but cross-sections, as it were, of currents whose essential consequence is motion, and which no sooner run in at one nerve than they run out again at another. The popular notion that mere consciousness as such is not essentially a forerunner of activity, that the latter must result from some superadded 'will-force,' is a very natural inference from those special cases in which we think of an act for an

indefinite length of time without the action taking place. These cases, however, are not the norm; they are cases of inhibition by antagonistic thoughts. When the blocking is released we feel as if an inward spring were let loose, and this is the additional impulse or *fiat* upon which the act effectively succeeds. We shall study anon the blocking and its release. Our higher thought is full of it. But where there is no blocking, there is naturally no hiatus between the thought-process and the motor discharge. *Movement is the natural immediate effect of feeling, irrespective of what the quality of the feeling may be. It is so in reflex action, it is so in emotional expression, it is so in the voluntary life.* Ideo-motor action is thus no paradox, to be softened or explained away. It obeys the type of all conscious action, and from it one must start to explain action in which a special fiat is involved.

It may be remarked in passing, that the inhibition of a movement no more involves an express effort or command than its execution does. Either of them *may* require it. But in all simple and ordinary cases, just as the bare presence of one idea prompts a movement, so the bare presence of another idea will prevent its taking place. Try to feel as if you were crooking your finger, whilst keeping it straight. In a minute it will fairly tingle with the imaginary change of position; yet it will not sensibly move, because *its not really moving* is also a part of what you have in mind. Drop *this* idea, think of the movement purely and simply, with all breaks off; and, presto! it takes place with no effort at all.

A waking man's behavior is thus at all times the resultant of two opposing neural forces. With unimaginable fineness some currents among the cells and fibres of his brain are playing on his motor nerves, whilst other currents, as unimaginably fine, are playing on the first currents, damming or helping them, altering their direction or their speed. The upshot of it all is, that whilst the currents must always end by being drained off through *some* motor nerves, they are drained off sometimes through one set and sometimes through another; and sometimes they keep each other in equilibrium so long that a superficial observer may think they are not drained off at all. Such an observer must remember, however, that from the physiological point of view a gesture, an expression of the brow, or an expulsion of the breath are movements as much as an act of locomotion is. A king's breath slays as well as an assassin's blow; and the outpouring of those currents which the magic imponderable streaming of our ideas

accompanies need not always be of an explosive or otherwise physically conspicuous kind.

ACTION AFTER DELIBERATION.

We are now in a position to describe *what happens in deliberate action*, or when the mind is the seat of many ideas related to each other in antagonistic or in favorable ways.^[469] One of the ideas is that of an act. By itself this idea would prompt a movement; some of the additional considerations, however, which are present to consciousness block the motor discharge, whilst others, on the contrary, solicit it to take place. The result is that peculiar feeling of inward unrest known as *indecision*. Fortunately it is too familiar to need description, for to describe it would be impossible. As long as it lasts, with the various objects before the attention, we are said to *deliberate*; and when finally the original suggestion either prevails and makes the movement take place, or gets definitively quenched by its antagonists, we are said to *decide*, or to *utter our voluntary fiat* in favor of one or the other course. The reinforcing and inhibiting ideas meanwhile are termed the *reasons or motives* by which the decision is brought about.

The process of deliberation contains endless degrees of complication. At every moment of it our consciousness is of an extremely complex object, namely the existence of the whole set of motives and their conflict, as explained on p. 275 of Vol. I. Of this object, the totality of which is realized more or less dimly all the while, certain parts stand out more or less sharply at one moment in the foreground, and at another moment other parts, in consequence of the oscillations of our attention, and of the 'associative' flow of our ideas. But no matter how sharp the foreground-reasons may be, or how imminently close to bursting through the dam and carrying the motor consequences their own way, the background, however dimly felt, is always there; and its presence (so long as the indecision actually lasts) serves as an effective check upon the irrevocable discharge. The deliberation may last for weeks or months, occupying at intervals the mind. The motives which yesterday seemed full of urgency and blood and life to-day feel strangely weak and pale and dead. But as little to-day as to-morrow is the question finally resolved. Something tells us that all this is provisional; that the weakened reasons will wax strong again, and the stronger weaken; that

equilibrium is unreachd; that testing our reasons, not obeying them, is still the order of the day, and that we must wait awhile, patient or impatiently, until our mind is made up 'for good and all.' This inclining, first to one then to another future, both of which we represent as possible, resembles the oscillations to and fro of a material body within the limits of its elasticity. There is inward strain, but no outward rupture. And this condition, plainly enough, is susceptible of indefinite continuance, as well in the physical mass as in the mind. If the elasticity give way, however, if the dam ever do break, and the currents burst the crust, vacillation is over and decision is irrevocably there.

The decision may come in any one of many modes. I will try briefly to sketch the most characteristic types of it, merely warning the reader that this is only an introspective account of symptoms and phenomena, and that all questions of causal agency, whether neural or spiritual, are relegated to a later page.

The particular reasons for or against action are of course infinitely various in concrete cases. But certain motives are more or less constantly in play. One of these is *impatience of the deliberative state*; or to express it otherwise, proneness to act or to decide merely because action and decision are, as such, agreeable, and relieve the tension of doubt and hesitancy. Thus it comes that we will often take any course whatever which happens to be most vividly before our minds, at the moment when this impulse to decisive action becomes extreme.

Against this impulse we have the *dread of the irrevocable*, which often engenders a type of character incapable of prompt and vigorous resolve, except perhaps when surprised into sudden activity. These two opposing motives twine round whatever other motives may be present at the moment when decision is imminent, and tend to precipitate or retard it. The conflict of these motives so far as they alone affect the matter of decision is a conflict as to *when* it shall occur. One says 'now,' the other says 'not yet.'

Another constant component of the web of motivation is the impulse to persist in a decision once made. There is no more remarkable difference in

human character than that between resolute and irresolute natures. Neither the physiological nor the psychical grounds of this difference have yet been analyzed. Its symptom is that whereas in the irresolute all decisions are provisional and liable to be reversed, in the resolute they are settled once for all and not disturbed again. Now into every one's deliberations the representation of one alternative will often enter with such sudden force as to carry the imagination with itself exclusively, and to produce an apparently settled decision in its own favor. These premature and spurious decisions are of course known to everyone. They often seem ridiculous in the light of the considerations that succeed them. But it cannot be denied that in the resolute type of character the accident that one of them has once been made does afterwards enter as a motive additional to the more genuine reasons why it should not be revoked, or if provisionally revoked, why it should be made again. How many of us persist in a precipitate course which, but for a moment of heedlessness, we might never have entered upon, simply because we hate to 'change our mind.'

FIVE TYPES OF DECISION.

Turning now to the form of the decision itself, we may distinguish four chief types. The first may be called *the reasonable type*. It is that of those cases in which the arguments for and against a given course seem gradually and almost insensibly to settle themselves in the mind and to end by leaving a clear balance in favor of one alternative, which alternative we then adopt without effort or constraint. Until this rational balancing of the books is consummated we have a calm feeling that the evidence is not yet all in, and this keeps action in suspense. But some day we wake with the sense that we see the thing rightly, that no new light will be thrown on the subject by farther delay, and that the matter had better be settled *now*. In this easy transition from doubt to assurance we seem to ourselves almost passive; the 'reasons' which decide us appearing to flow in from the nature of things, and to owe nothing to our will. We have, however, a perfect sense of being *free*, in that we are devoid of any feeling of coercion. The conclusive reason for the decision in these cases usually is the discovery that we can refer the case to a *class* upon which we are accustomed to act unhesitatingly in a certain stereotyped way. It may be said in general that a great part of every deliberation consists in the turning over of all the possible modes of

conceiving the doing or not doing of the act in point. The moment we hit upon a conception which lets us apply some principle of action which is a fixed and stable part of our Ego, our state of doubt is at an end. Persons of authority, who have to make many decisions in the day, carry with them a set of heads of classification, each bearing its motor consequence, and under these they seek as far as possible to range each new emergency as it occurs. It is where the emergency belongs to a species without precedent, to which consequently no cut-and-dried maxim will apply, that we feel most at a loss, and are distressed at the indeterminateness of our task. As soon, however, as we see our way to a familiar classification, we are at ease again. *In action as in reasoning, then, the great thing is the quest of the right conception.* The concrete dilemmas do not come to us with labels gummed upon their backs. We may name them by many names. The wise man is he who succeeds in finding the name which suits the needs of the particular occasion best. A 'reasonable' character is one who has a store of stable and worthy ends, and who does not decide about an action till he has calmly ascertained whether it be ministerial or detrimental to any one of these.

In the next two types of decision, the final fiat occurs before the evidence is all 'in.' It often happens that no paramount and authoritative reason for either course will come. Either seems a case of a Good, and there is no umpire as to which good should yield its place to the other. We grow tired of long hesitation and inconclusiveness, and the hour may come when we feel that even a bad decision is better than no decision at all. Under these conditions it will often happen that some accidental circumstance, supervening at a particular moment upon our mental weariness, will upset the balance in the direction of one of the alternatives, to which then we feel ourselves committed, although an opposite accident at the same time might have produced the opposite result.

In the *second type* of case our feeling is to a certain extent that of letting ourselves drift with a certain indifferent acquiescence in a direction accidentally determined *from without*, with the conviction that, after all, we

might as well stand by this course as by the other, and that things are in any event sure to turn out sufficiently right.

In the third type the determination seems equally accidental, but it comes from within, and not from without. It often happens, when the absence of imperative principle is perplexing and suspense distracting, that we find ourselves acting, as it were, automatically, and as if by a spontaneous discharge of our nerves, in the direction of one of the horns of the dilemma. But so exciting is this sense of motion after our intolerable pent-up state, that we eagerly throw ourselves into it. 'Forward now!' we inwardly cry, 'though the heavens fall.' This reckless and exultant espousal of an energy so little premeditated by us that we feel rather like passive spectators cheering on the display of some extraneous force than like voluntary agents, is a type of decision too abrupt and tumultuous to occur often in humdrum and cool-blooded natures. But it is probably frequent in persons of strong emotional endowment and unstable or vacillating character. And in men of the world-shaking type, the Napoleons, Luthers, etc., in whom tenacious passion combines with ebullient activity, when by any chance the passion's outlet has been dammed by scruples or apprehensions, the resolution is probably often of this catastrophic kind. The flood breaks quite unexpectedly through the dam. That it should so often do so is quite sufficient to account for the tendency of these characters to a fatalistic mood of mind. And the fatalistic mood itself is sure to reinforce the strength of the energy just started on its exciting path of discharge.

There is a *fourth form* of decision, which often ends deliberation as suddenly as the third form does. It comes when, in consequence of some outer experience or some inexplicable inward charge, *we suddenly pass from the easy and careless to the sober and strenuous mood*, or possibly the other way. The whole scale of values of our motives and impulses then undergoes a change like that which a change of the observer's level produces on a view. The most sobering possible agents are objects of grief and fear. When one of these affects us, all 'light fantastic' notions lose their motive power, all solemn ones find theirs multiplied many-fold. The consequence is an instant abandonment of the more trivial projects with which we had been dallying, and an instant practical acceptance of the more grim and earnest alternative which till then could not extort our mind's consent. All those 'changes of heart,' 'awakenings of conscience,' etc., which

make new men of so many of us, may be classed under this head. The character abruptly rises to another 'level,' and deliberation comes to an immediate end.^[470]

In the *fifth and final type* of decision, the feeling that the evidence is all in, and that reason has balanced the books, may be either present or absent. But in either case we feel, in deciding, as if we ourselves by our own wilful act inclined the beam; in the former case by adding our living effort to the weight of the logical reason which, taken alone, seems powerless to make the act discharge; in the latter by a kind of creative contribution of something instead of a reason which does a reason's work. The slow dead heave of the will that is felt in these instances makes of them a class altogether different subjectively from all the three preceding classes. What the heave of the will betokens metaphysically, what the effort might lead us to infer about a will-power distinct from motives, are not matters that concern us yet. Subjectively and phenomenally, the *feeling of effort*, absent from the former decisions, accompanies these. Whether it be the dreary resignation for the sake of austere and naked duty of all sorts of rich mundane delights, or whether it be the heavy resolve that of two mutually exclusive trains of future fact, both sweet and good, and with no strictly objective or imperative principle of choice between them, one shall forevermore become impossible, while the other shall become reality, it is a desolate and acrid sort of act, an excursion into a lonesome moral wilderness. If examined closely, its chief difference from the three former cases appears to be that in those cases the mind at the moment of deciding on the triumphant alternative dropped the other one wholly or nearly out of sight, whereas here both alternatives are steadily held in view, and in the very act of murdering the vanquished possibility the chooser realizes how much in that instant he is making himself lose. It is deliberately driving a thorn into one's flesh; and the sense of *inward effort* with which the act is accompanied is an element which sets the fourth type of decision in strong contrast with the previous three varieties, and makes of it an altogether peculiar sort of mental phenomenon. The immense majority of human decisions are decisions without effort. In comparatively few of them, in most people, does effort accompany the final act. We are, I think, misled into supposing that effort is more frequent than it is, by the fact that *during deliberation* we so often have a feeling of how great an effort it would take to make a decision *now*. Later, after the decision has made itself with ease,

we recollect this and erroneously suppose the effort also to have been made then.

The existence of the effort as a phenomenal fact in our consciousness cannot of course be doubted or denied. Its significance, on the other hand, is a matter about which the gravest difference of opinion prevails. Questions as momentous as that of the very existence of spiritual causality, as vast as that of universal predestination or free-will, depend on its interpretation. It therefore becomes essential that we study with some care the conditions under which the feeling of volitional effort is found.

THE FEELING OF EFFORT.

When, awhile back ([p. 526](#)), I said that *consciousness* (or the neural process which goes with it) *is in its very nature impulsive*, I added in a note the proviso that *it must be sufficiently intense*. Now there are remarkable differences in the power of different sorts of consciousness to excite movement. The intensity of some feelings is practically apt to be below the discharging point, whilst that of others is apt to be above it. By practically apt, I mean apt under ordinary circumstances. These circumstances may be habitual inhibitions, like that comfortable feeling of the *dolce far niente* which gives to each and all of us a certain dose of laziness only to be overcome by the acuteness of the impulsive spur; or they may consist in the native inertia, or internal resistance, of the motor centres themselves making explosion impossible until a certain inward tension has been reached and overpast. These conditions may vary from one person to another and in the same person from time to time. The neural inertia may wax or wane, and the habitual inhibitions dwindle or augment. The intensity of particular thought-processes and stimulations may also change independently, and particular paths of association grow more pervious or less so. There thus result great possibilities of alteration in the actual impulsive efficacy of particular motives compared with others. It is where the normally less efficacious motive becomes more efficacious and the normally more efficacious one less so that actions ordinarily effortless, or abstinences ordinarily easy, either become impossible or are effected, if at all, by the expenditure of effort. A little more description will make it plainer what these cases are.

*There is a certain normal ratio in the impulsive power of different sorts of motive, which characterizes what may be called ordinary healthiness of will, and which is departed from only at exceptional times or by exceptional individuals. The states of mind which normally possess the most impulsive quality are either those which represent objects of passion, appetite, or emotion—objects of instinctive reaction, in short; or they are feelings or ideas of pleasure or of pain; or ideas which for any reason we have grown accustomed to obey so that the habit of reacting on them is ingrained; or finally, in comparison with ideas of remoter objects, they are ideas of objects present or near in space and time. Compared with these various objects, all far-off considerations, all highly abstract conceptions, unaccustomed reasons, and motives foreign to the instinctive history of the race, have little or no impulsive power. They prevail, when they ever do prevail, *with effort; and the normal, as distinguished from the pathological, sphere of effort is thus found wherever non-instinctive motives to behavior are to rule the day.**

Healthiness of will moreover requires a certain amount of complication in the process which precedes the fiat or the act. Each stimulus or idea, at the same time that it wakens its own impulse, must arouse other ideas (associated and consequential) with their impulses, and action must follow, neither too slowly nor too rapidly, as the resultant of all the forces thus engaged. Even when the decision is very prompt, there is thus a sort of preliminary survey of the field and a vision of which course is best before the fiat comes. And where the will is healthy, *the vision must be right* (i.e., the motives must be on the whole in a normal or not too unusual ratio to each other), *and the action must obey the vision's lead.*

Unhealthiness of will may thus come about in many ways. The action may follow the stimulus or idea too rapidly, leaving no time for the arousal of restraining associates—we then have a precipitate will. Or, although the associates may come, the ratio which the impulsive and inhibitive forces normally bear to each other may be distorted, and we then have a will which

is perverse. The perversity, in turn, may be due to either of many causes—too much intensity, or too little, here; too much or too little inertia there; or elsewhere too much or too little inhibitory power. *If we compare the outward symptoms of perversity together, they fall into two groups, in one of which normal actions are impossible, and in the other abnormal ones are irrepressible. Briefly, we may call them respectively the obstructed and the explosive will.*

It must be kept in mind, however, that since the resultant action is always due to the *ratio* between the obstructive and the explosive forces which are present, we never can tell by the mere outward symptoms to what *elementary* cause the perversion of a man's will may be due, whether to an increase of one component or a diminution of the other. One may grow explosive as readily by losing the usual brakes as by getting up more of the impulsive steam; and one may find things impossible as well through the enfeeblement of the original desire as through the advent of new lions in the path. As Dr. Clouston says, "the driver may be so weak that he cannot control well-broken horses, or the horses may be so hard-mouthed that no driver can pull them up." In some concrete cases (whether of explosive or of obstructed will) it is difficult to tell whether the trouble is due to inhibitory or to impulsive change. Generally, however, we can make a plausible guess at the truth.

THE EXPLOSIVE WILL.

There is a normal type of character, for example, in which impulses seem to discharge so promptly into movements that inhibitions get no time to arise. These are the 'dare-devil' and 'mercurial' temperaments, overflowing with animation, and fizzling with talk, which are so common in the Latin and Celtic races, and with which the cold-blooded and long-headed English character forms so marked a contrast. Monkeys these people seem to us, whilst we seem to them reptilian. It is quite impossible to judge, as between an obstructed and an explosive individual, which has the greatest sum of vital energy. An explosive Italian with good perception and intellect will cut a figure as a perfectly tremendous fellow, on an inward capital that could be tucked away inside of an obstructed Yankee and hardly let you know that it was there. He will be the king of his company, sing all the songs and make

all the speeches, lead the parties, carry out the practical jokes, kiss all the girls, fight the men, and, if need be, lead the forlorn hopes and enterprises, so that an onlooker would think he has more life in his little finger than can exist in the whole body of a correct judicious fellow. But the judicious fellow all the while may have all these possibilities and more besides, ready to break out in the same or even a more violent way, if only the brakes were taken off. It is the absence of scruples, of consequences, of considerations, the extraordinary simplification of each moment's mental outlook, that gives to the explosive individual such motor energy and ease; it need not be the greater intensity of any of his passions, motives, or thoughts. As mental evolution goes on, the complexity of human consciousness grows ever greater, and with it the multiplication of the inhibitions to which every impulse is exposed. But this predominance of inhibition has a bad as well as a good side; and if a man's impulses are in the main orderly as well as prompt, if he has courage to accept their consequences, and intellect to lead them to a successful end, he is all the better for his hair-trigger organization, and for not being 'sicklied o'er with the pale cast of thought.' Many of the most successful military and revolutionary characters in history have belonged to this simple but quick-witted impulsive type. Problems come much harder to reflective and inhibitive minds. They can, it is true, solve much vaster problems; and they can avoid many a mistake to which the men of impulse are exposed. But when the latter do not make mistakes, or when they are always able to retrieve them, theirs is one of the most engaging and indispensable of human types.^[471]

In infancy, and in certain conditions of exhaustion as well as in peculiar pathological states, the inhibitory power may fail to arrest the explosions of the impulsive discharge. We have then an explosive temperament temporarily realized in an individual who at other times may be of a relatively obstructed type. I cannot do better here than copy a few pages from Dr. Clouston's excellent work:^[472]

"Take a child of six months, and there is absolutely no such brain-power existent as mental inhibition; no desire or tendency is stopped by a mental act.... At a year old the rudiments of the great faculty of self-control are clearly apparent in most children. They will resist the desire to seize the gas-flame, they will not upset the milk-jug, they will obey orders to sit still when they want to run about, all through a

higher mental inhibition. But the power of control is just as gradual a development as the motions of the hands.... Look at a more complicated act, that will be recognized by any competent physiologist to be automatic and beyond the control of any ordinary inhibitory power, e.g., irritate and tease a child of one or two years sufficiently, and it will suddenly strike out at you; suddenly strike at a man, and he will either perform an act of defence or offence, or both, quite automatically, and without power of controlling himself. Place a bright tempting toy before a child of a year, and it will be instantly appropriated. Place cold water before a man dying of thirst, and he will take and drink it without power of doing otherwise. Exhaustion of nervous energy always lessens the inhibitory power. Who is not conscious of this? 'Irritability' is one manifestation of this. Many persons have so small a stock of reserve brain-power—that most valuable of all brain-qualities—that it is soon used up, and you see at once that they lose their power of self-control very soon. They are angels or demons just as they are fresh or tired. That surplus store of energy or resistive force which provides, in persons normally constituted, that moderate excesses in all directions shall do no great harm so long as they are not too often repeated, not being present in these people, overwork, over-drinking, or small debauches leave them at the mercy of their morbid impulses without power of resistance.... Woe to the man who uses up his surplus stock of brain-inhibition too near the bitter end, or too often!... The physiological word inhibition can be used synonymously with the psychological and ethical expression self-control, or with the will when exercised in certain directions. It is the characteristic of most forms of mental disease for self-control to be lost, but this loss is usually part of a general mental affection with melancholic, maniacal, demented, or delusional symptoms as the chief manifestation of the disease. There are other cases, not so numerous, where the loss of the power of inhibition is the chief and by far the most marked symptom.... I shall call this form 'Inhibitory Insanity.' Some of these cases have uncontrollable impulses to violence and destruction, others to homicide, others to suicide prompted by no depressed feelings, others to acts of animal gratification (satyriasis, nymphomania, erotomania, bestiality), others to drinking too much alcohol (dipsomania), others towards setting

things on fire (pyromania), others to stealing (kleptomania), and others towards immoralities of all sorts. The impulsive tendencies and morbid desires are innumerable in kind. Many of these varieties of Insanity have been distinguished by distinct names. To dig up and eat dead bodies (necrophilism), to wander from home and throw off the restraints of society (planomania), to act like a wild beast (lycanthopia), etc. Action from impulse in all these directions may take place from a loss of controlling power in the higher regions of the brain, or from an over-development of energy in certain portions of the brain, which the normal power of inhibition cannot control. The driver may be so weak that he cannot control well-broken horses, or the horses may be so hard-mouthed that no driver can pull them up. Both conditions may arise from purely cerebral disorder ... or may be reflex.... The *ego*, the man, the will, may be non-existent for the time. The most perfect examples of this are murders done during somnambulism or epileptic unconsciousness, or acts done in the hypnotic state. There is no conscious desire to attain the object at all in such cases. In other cases there is consciousness and memory present, but no power of restraining action. The simplest example of this is where an imbecile or dement, seeing something glittering, appropriates it to himself, or when he commits indecent sexual acts. Through disease a previously sane and vigorous-minded person may get into the same state. The motives that would lead other persons not to do such acts do not operate in such persons. I have known a man steal who said he had no intense longing for the article he appropriated at all, at least consciously, but his will was in abeyance, and he could not resist the ordinary desire of possession common to all human nature."

It is not only those technically classed imbeciles and dements who exhibit this promptitude of impulse and tardiness of inhibition. Ask half the common drunkards you know why it is that they fall so often a prey to temptation, and they will say that most of the time they cannot tell. It is a sort of vertigo with them. Their nervous centres have become a sluice-way pathologically unlocked by every passing conception of a bottle and a glass. They do not thirst for the beverage; the taste of it may even appear repugnant; and they perfectly foresee the morrow's remorse. But when they think of the liquor or see it, they find themselves preparing to drink, and do

not stop themselves: and more than this they cannot say. Similarly a man may lead a life of incessant love-making or sexual indulgence, though what spurs him thereto seems rather to be suggestions and notions of possibility than any overweening strength in his affections or lusts. He may even be physically impotent all the while. The paths of natural (or it may be unnatural) impulse are so pervious in these characters that the slightest rise in the level of innervation produces an overflow. It is the condition recognized in pathology as 'irritable weakness.' The phase known as nascency or latency is so short in the excitement of the neural tissues that there is no opportunity for strain or tension to accumulate within them; and the consequence is that with all the agitation and activity, the amount of real feeling engaged may be very small. The hysterical temperament is the playground *par excellence* of this unstable equilibrium. One of these subjects will be filled with what seems the most genuine and settled aversion to a certain line of conduct, and the very next *instant* follow the stirring of temptation and plunge in it up to the neck. Professor Ribot well gives the name of 'Le Règne des Caprices' to the chapter in which he describes the hysterical temperament in his interesting little monograph 'The Diseases of the Will.'

Disorderly and impulsive conduct may, on the other hand, come about where the neural tissues preserve their proper inward tone, and where the inhibitory power is normal or even unusually great. In such cases *the strength of the impulsive idea is preternaturally exalted*, and what would be for most people the passing suggestion of a possibility becomes a gnawing, craving urgency to act. Works on insanity are full of examples of these morbid insistent ideas, in obstinately struggling against which the unfortunate victim's soul often sweats with agony, ere at last it gets swept away. One instance will stand for many; M. Ribot quotes it from Calmeil:
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"Glénadal, having lost his father in infancy, was brought up by his mother, whom he adored. At sixteen, his character, till then good and docile, changed. He became gloomy and taciturn. Pressed with questions by his mother, he decided at last to make a confession. 'To you,' said he, 'I owe everything; I love you with all my soul; yet for some time past an incessant idea drives me to kill you. Prevent so terrible a misfortune from happening, in case some day the temptation

should overpower me: allow me to enlist.' Notwithstanding pressing solicitations, he was firm in his resolve, went off, and was a good soldier. Still a secret impulse stimulated him without cessation to desert in order to come home and kill his mother. At the end of his term of service the idea was as strong as on the first day. He enlisted for another term. The murderous instinct persisted, but substituted another victim. He no longer thought of killing his mother—the horrible impulse pointed day and night towards his sister-in-law. In order to resist the second impulse, he condemned himself to perpetual exile. At this time one of his old neighbors arrived in the regiment. Glénadal confesses all his trouble. 'Be at rest,' said the other. 'Your crime is impossible; your sister-in-law has just died.' At these words Glénadal rises like a delivered captive. Joy fills his heart. He travels to the home of his childhood, unvisited for so many years. But as he arrives he sees his sister-in-law living. He gives a cry, and the terrible impulse seizes him again as a prey. That very evening he makes his brother tie him fast. 'Take a solid rope, bind me like a wolf in the barn, and go and tell Dr. Calmeil....' From him he got admission to an insane asylum. The evening before his entrance he wrote to the director of the establishment: 'Sir, I am to become an inmate of your house. I shall behave there as if I were in the regiment. You will think me cured. At moments perhaps I shall pretend to be so. Never believe me. Never let me out on any pretext. If I beg to be released, double your watchfulness; the only use I shall make of my liberty will be to commit a crime which I abhor.'"^[474]

The craving for drink in real dipsomaniacs, or for opium or chloral in those subjugated, is of a strength of which normal persons can form no conception. "Were a keg of rum in one corner of a room and were a cannon constantly discharging balls between me and it, I could not refrain from passing before that cannon in order to get the rum;" "If a bottle of brandy stood at one hand and the pit of hell yawned at the other, and I were convinced that I should be pushed in as sure as I took one glass, I could not refrain:" such statements abound in dipsomaniacs' mouths. Dr. Mussey of Cincinnati relates this case:

"A few years ago a tippler was put into an almshouse in this State. Within a few days he had devised various expedients to procure rum, but failed. At length, however, he hit upon one which was successful. He went into the wood-yard of the establishment, placed one hand upon the block, and with an axe in the other, struck it off at a single blow. With the stump raised and streaming he ran into the house and cried, 'Get some rum! get some rum! my hand is off!' In the confusion and bustle of the occasion a bowl of rum was brought, into which he plunged the bleeding member of his body, then raising the bowl to his mouth, drank freely, and exultingly exclaimed, 'Now I am satisfied.' Dr. J. E. Turner tells of a man who, while under treatment for inebriety, during four weeks secretly drank the alcohol from six jars containing morbid specimens. On asking him why he had committed this loathsome act, he replied: 'Sir, it is as impossible for me to control this diseased appetite as it is for me to control the pulsations of my heart.'"

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The passion of love may be called a monomania to which all of us are subject, however otherwise sane. It can coexist with contempt and even hatred for the 'object' which inspires it, and whilst it lasts the whole life of the man is altered by its presence. Alfieri thus describes the struggles of his unusually powerful inhibitive power with his abnormally excited impulses toward a certain lady:

"Contemptible in my own eyes, I fell into such a state of melancholy as would, if long continued, inevitably have led to insanity or death. I continued to wear my disgraceful fetters till towards the end of January, 1775, when my rage, which had hitherto so often been restrained within bounds, broke forth with the greatest violence. On returning one evening from the opera (the most insipid and tiresome amusement in Italy), where I had passed several hours in the box of the woman who was by turns the object of my antipathy and my love, I took the firm determination of emancipating myself forever from her yoke. Experience had taught me that flight, so far from enabling me to persevere in my resolutions, tended on the contrary to weaken and destroy them; I was inclined therefore to subject myself to a still more severe trial, imagining from the obstinacy and peculiarity of my

character that I should succeed most certainly by the adoption of such measures as would compel me to make the greatest efforts. I determined never to leave the house, which, as I have already said, was exactly opposite that of the lady; to gaze at her windows, to see her go in and out every day, to listen to the sound of her voice, though firmly resolved that no advances on her part, either direct or indirect, no tender remembrances, nor in short any other means which might be employed, should ever again tempt me to a revival of our friendship. I was determined to die or liberate myself from my disgraceful thralldom. In order to give stability to my purpose, and to render it impossible for me to waver without the imputation of dishonor, I communicated my determination to one of my friends, who was greatly attached to me, and whom I highly esteemed. He had lamented the state of mind into which I had fallen, but not wishing to give countenance to my conduct, and seeing the impossibility of inducing me to abandon it, he had for some time ceased to visit at my house. In the few lines which I addressed to him, I briefly stated the resolution I had adopted, and as a pledge of my constancy I sent him a long tress of my ugly red hair. I had purposely caused it to be cut off in order to prevent my going out, as no one but clowns and sailors then appeared in public with short hair. I concluded my billet by conjuring him to strengthen and aid my fortitude by his presence and example. Isolated in this manner in my own house, I prohibited all species of intercourse, and passed the first fifteen days in uttering the most frightful lamentations and groans. Some of my friends came to visit me, and appeared to commiserate my situation, perhaps because I did not myself complain; but my figure and whole appearance bespoke my sufferings. Wishing to read something I had recourse to the gazettes, whole pages of which I frequently ran over without understanding a single word.... I passed more than two months till the end of March 1775, in a state bordering on frenzy; but about this time a new idea darted into my mind, which tended to assuage my melancholy."

This was the idea of poetical composition, at which Alfieri describes his first attempts, made under these diseased circumstances, and goes on:

"The only good that occurred to me from this whim was that of gradually detaching me from love, and of awakening my reason which had so long lain dormant. I no longer found it necessary to cause myself to be tied with cords to a chair, in order to prevent me from leaving my house and returning to that of my lady. This had been one of the expedients I devised to render myself wise by force. The cords were concealed under a large mantle in which I was enveloped, and only one hand remained at liberty. Of all those who came to see me, not one suspected I was bound down in this manner. I remained in this situation for whole hours; Elias, who was my jailer, was alone intrusted with the secret. He always liberated me, as he had been enjoined, whenever the paroxysms of my rage subsided. Of all the whimsical methods which I employed, however, the most curious was that of appearing in masquerade at the theatre towards the end of the carnival. Habited as Apollo, I ventured to present myself with a lyre, on which I played as well as I was able and sang some bad verses of my own composing. Such effrontery was diametrically opposite to my natural character. The only excuse I can offer for such scenes was my inability to resist an imperious passion. I felt that it was necessary to place an insuperable barrier between its object and me; and I saw that the strongest of all was the shame to which I should expose myself by renewing an attachment which I had so publicly turned into ridicule."

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Often the insistent idea is of a trivial sort, but it may wear the patient's life out. His hands feel dirty, they must be washed. He *knows* they are not dirty; yet to get rid of the teasing idea he washes them. The idea, however, returns in a moment, and the unfortunate victim, who is not in the least deluded *intellectually*, will end by spending the whole day at the wash-stand. Or his clothes are not 'rightly' put on; and to banish the thought he takes them off and puts them on again, till his toilet consumes two or three hours of time. Most people have the potentiality of this disease. To few has it not happened to conceive, after getting into bed, that they may have forgotten to lock the front door, or to turn out the entry gas. And few of us have not on some occasion got up to repeat the performance, less because they believed in the reality of its omission than because only so could they banish the worrying doubt and get to sleep.^[477]

THE OBSTRUCTED WILL.

In striking contrast with the cases in which inhibition is insufficient or impulsion in excess are those in which impulsion is insufficient or inhibition of in excess. We all know the condition described on p. 404 of Vol. I, in which the mind for a few moments seems to lose its focussing power and to be unable to rally its attention to any determinate thing. At such times we sit blankly staring and do nothing. The objects of consciousness fail to touch the quick or break the skin. They are there, but do not reach the level of effectiveness. This state of non-efficacious presence is the normal condition of *some* objects, in all of us. Great fatigue or exhaustion may make it the condition of almost all objects; and an apathy resembling that then brought about is recognized in asylums under the name of *abulia* as a symptom of mental disease. The healthy state of the will requires, as aforesaid, both that vision should be right, and that action should obey its lead. But in the morbid condition in question the vision may be wholly unaffected, and the intellect clear, and yet the act either fails to follow or follows in some other way. "*Video meliora proboque, deteriora sequor*" is the classic expression of the latter condition of mind. The former it is to which the name *abulia* peculiarly applies. The patients, says Guislain,

"are able to will inwardly, mentally, according to the dictates of reason. They experience the desire to act, but they are powerless to act as they should.... Their will cannot overpass certain limits: one would say that the force of action within them is blocked up: the *I will* does not transform itself into impulsive volition, into active determination. Some of these patients wonder themselves at the impotence with which their will is smitten. If you abandon them to themselves, they pass whole days in their bed or on a chair. If one speaks to them or excites them, they express themselves properly though briefly; and judge of things pretty well."^[478]

In [Chapter XXI](#), as will be remembered, it was said that the sentiment of reality with which an object appealed to the mind is proportionate (amongst other things) to its efficacy as a stimulus to the will. Here we get the obverse side of the truth. Those ideas, objects, considerations, which (in

these lethargic states) fail to *get to* the will, fail to draw blood, seem, in so far forth, distant and unreal. The connection of the reality of things with their effectiveness as motives is a tale that has never yet been fully told. The moral tragedy of human life comes almost wholly from the fact that the link is ruptured which normally should hold between vision of the truth and action, and that this pungent sense of effective reality will not attach to certain ideas. Men do not differ so much in their mere feelings and conceptions. Their notions of possibility and their ideals are not as far apart as might be argued from their differing fates. No class of them have better sentiments or feel more constantly the difference between the higher and the lower path in life than the hopeless failures, the sentimentalist, the drunkards, the schemers, the 'dead-beats,' whose life is one long contradiction between knowledge and action, and who, with full command of theory, never get to holding their limp characters erect. No one eats of the fruit of the tree of knowledge as they do; as far as moral insight goes, in comparison with them, the orderly and prosperous philistines whom they scandalize are sucking babes. And yet their moral knowledge, always there grumbling and rumbling in the background,—discerning, commenting, protesting, longing, half resolving,—never wholly resolves, never gets its voice out of the minor into the major key, or its speech out of the subjunctive into the imperative mood, never breaks the spell, never takes the helm into its hands. In such characters as Rousseau and Restif it would seem as if the lower motives had all the impulsive efficacy in their hands. Like trains with the right of way, they retain exclusive possession of the track. The more ideal motives exist alongside of them in profusion, but they never get switched on, and the man's conduct is no more influenced by them than an express train is influenced by a wayfarer standing by the roadside and calling to be taken aboard. They are an inert accompaniment to the end of time; and the consciousness of inward hollowness that accrues from habitually seeing the better only to do the worse, is one of the saddest feelings one can bear with him through this vale of tears.

We now see at one view when it is that effort complicates volition. It does so whenever a rarer and more ideal impulse is called upon to neutralize others of a more instinctive and habitual kind; it does so whenever strongly explosive tendencies are checked, or strongly obstructive conditions overcome. The *âme bien née*, the child of the sunshine, at whose birth the fairies made their gifts, does not need much of it in his life. The hero and the neurotic subject, on the other hand, do. Now our spontaneous way of conceiving the effort, under all these circumstances, is as an active force adding its strength to that of the motives which ultimately prevail. When outer forces impinge upon a body, we say that the resultant motion is in the line of least resistance, or of greatest traction. But it is a curious fact that our spontaneous language never speaks of volition with effort in this way. Of course if we proceed *a priori* and define the line of least resistance as the line that is followed, the physical law must also hold good in the mental sphere. But we *feel*, in all hard cases of volition, as if the line taken, when the rarer and more ideal motives prevail, were the line of greater resistance, and as if the line of coarser motivation were the more pervious and easy one, even at the very moment when we refuse to follow it. He who under the surgeon's knife represses cries of pain, or he who exposes himself to social obloquy for duty's sake, feels as if he were following the line of greatest temporary resistance. He speaks of conquering and overcoming his impulses and temptations.

But the sluggard, the drunkard, the coward, never talk of their conduct in that way or say they resist their energy, overcome their sobriety, conquer their courage, and so forth. If in general we class all springs of action as propensities on the one hand and ideals on the other, the sensualist never says of his behavior that it results from a victory over his ideals, but the moralist always speaks of his as a victory over his propensities. The sensualist uses terms of inactivity, says he forgets his ideals, is deaf to duty, and so forth; which terms seem to imply that the ideal motives *per se* can be annulled without energy or effort, and that the strongest mere traction lies in the line of the propensities. The ideal impulse appears, in comparison with this, a still small voice which must be artificially reinforced to prevail. Effort is what reinforces it, making things seem as if, while the force of propensity were essentially a fixed quantity, the ideal force might be of various amount. But what determines the amount of the effort when, by its

aid, an ideal motive becomes victorious over a great sensual resistance? The very greatness of the resistance itself. If the sensual propensity is small, the effort is small. The latter is *made great* by the presence of a great antagonist to overcome. And if a brief definition of ideal or moral action were required, none could be given which would better fit the appearances than this: *It is action in the line of the greatest resistance.*

The facts may be most briefly symbolized thus, P standing for the propensity, I for the ideal impulse, and E for the effort:

I per se < P.

I + E > P.

In other words, if E adds itself to I, P immediately offers the least resistance, and motion occurs in spite of it.

But the E does not seem to form an integral part of the I. It appears adventitious and indeterminate in advance. We can make more or less as we please, and *if* we make enough we can convert the greatest mental resistance into the least. Such, at least, is the impression which the facts spontaneously produce upon us. But we will not discuss the truth of this impression at present; let us rather continue our descriptive detail.

PLEASURE AND PAIN AS SPRINGS OF ACTION.

Objects and thoughts of objects start our action, but the pleasures and pains which action brings modify its course and regulate it; and later the thoughts of the pleasures and the pains acquire themselves impulsive and inhibitive power. Not that the thought of a pleasure need be itself a pleasure, usually it is the reverse—*nessun maggior dolore*—as Dante says—and not that the thought of pain need be a pain, for, as Homer says, "griefs are often afterwards an entertainment." But as present pleasures are tremendous reinforcers, and present pains tremendous inhibitors of whatever action leads to them, so the thoughts of pleasures and pains take rank amongst the thoughts which have most impulsive and inhibitive power. The precise relation which these thoughts hold to other thoughts is thus a matter demanding some attention.

If a movement feels agreeable, we repeat and repeat it as long as the pleasure lasts. If it hurts us, our muscular contractions at the instant stop. So complete is the inhibition in this latter case that it is almost impossible for a man to cut or mutilate himself slowly and deliberately—his hand invincibly refusing to bring on the pain. And there are many pleasures which, when once we have begun to taste them, make it all but obligatory to keep up the activity to which they are due. So widespread and searching is this influence of pleasures and pains upon our movements that a premature philosophy has decided that these are our only spurs to action, and that wherever they seem to be absent, it is only because they are so far on among the 'remoter' images that prompt the action that they are overlooked.

This is a great mistake, however. Important as is the influence of pleasures and pains upon our movements, they are far from being our only stimuli. With the manifestations of instinct and emotional expression, for example, they have absolutely nothing to do. Who smiles for the pleasure of the smiling, or frowns for the pleasure of the frown? Who blushes to escape the discomfort of not blushing? Or who in anger, grief, or fear is actuated to the movements which he makes by the pleasures which they yield? In all these cases the movements are discharged fatally by the *vis a tergo* which the stimulus exerts upon a nervous system framed to respond in just that way. The objects of our rage, love, or terror, the occasions of our tears and smiles, whether they be present to our senses, or whether they be merely represented in idea, have this peculiar sort of impulsive power. The *impulsive quality* of mental states is an attribute behind which we cannot go. Some states of mind have more of it than others, some have it in this direction, and some in that. Feelings of pleasure and pain have it, and perceptions and imaginations of fact have it, but neither have it exclusively or peculiarly. It is of the essence of all consciousness (or of the neural process which underlies it) to instigate movement of some sort. That with one creature and object it should be of one sort, with others of another sort, is a problem for evolutionary history to explain. However the actual impulses may have arisen, they must now be described as they exist; and those persons obey a curiously narrow teleological superstition who think themselves bound to interpret them in every instance as effects of the secret sollicitancy of pleasure and repugnancy of pain.^[479]

It might be that to *reflection* such a narrow teleology would justify itself, that pleasures and pains might seem the only *comprehensible and reasonable* motives for action, the only motives on which we *ought* to act. That is an *ethical* proposition, in favor of which a good deal may be said. But it is not a *psychological* proposition; and nothing follows from it as to the motives upon which as a matter of fact we *do* act. These motives are supplied by innumerable objects, which innervate our voluntary muscles by a process as automatic as that by which they light a fever in our breasts. If the thought of pleasure can impel to action, surely other thoughts may. Experience only can decide which thoughts do. The chapters on Instinct and Emotion have shown us that their name is legion; and with this verdict we ought to remain contented, and not seek an illusory simplification at the cost of half the facts.

If in these our *first* acts pleasures and pains bear no part, as little do they bear in our last acts, or those artificially acquired performances which have become habitual. All the daily routine of life, our dressing and undressing, the coming and going from our work or carrying through of its various operations, is utterly without mental reference to pleasure and pain, except under rarely realized conditions. It is ideo-motor action. As I do not breathe for the pleasure of the breathing, but simply find that I *am* breathing, so I do not write for the pleasure of the writing, but simply because I have once begun, and being in a state of intellectual excitement which keeps venting itself in that way, find that I *am* writing still. Who will pretend that when he idly fingers his knife-handle at the table, it is for the sake of any pleasure which it gives him, or pain which he thereby avoids. We do all these things because at the moment we cannot help it; our nervous systems are so shaped that they overflow in just that way; and for many of our idle or purely 'nervous' and fidgety performances we can assign absolutely no *reason* at all.

Or what shall be said of a shy and unsociable man who receives point-blank an invitation to a small party? The thing is to him an abomination; but your presence exerts a compulsion on him, he can think of no excuse, and so says yes, cursing himself the while for what he does. He is unusually *sui compos* who does not every week of his life fall into some such blundering act as this. Such instances of *voluntas invita* show not only that our acts cannot all be conceived as effects of represented pleasure, but that they

cannot even be classed as cases of represented *good*. The class 'goods' contains many more generally influential motives to action than the class 'pleasants.' Pleasures often attract us only because we deem them goods. Mr. Spencer, e.g., urges us to court pleasures for their influence upon health, which comes to us as a good. But almost as little as under the form of pleasures do our acts invariably appear to us under the form of *goods*. All diseased impulses and pathological fixed ideas are instances to the contrary. It is the very badness of the act that gives it then its vertiginous fascination. Remove the prohibition, and the attraction stops. In my university days a student threw himself from an upper entry window of one of the college buildings and was nearly killed. Another student, a friend of my own, had to pass the window daily in coming and going from his room, and experienced a dreadful temptation to imitate the deed. Being a Catholic, he told his director, who said, 'All right! if you must, you must,' and added, 'Go ahead and do it,' thereby instantly quenching his desire. This director knew how to minister to a mind diseased. But we need not go to minds diseased for examples of the occasional tempting-power of simple badness and unpleasantness as such. Every one who has a wound or hurt anywhere, a sore tooth, e.g., will ever and anon press it just to bring out the pain. If we are near a new sort of stink, we must sniff it again just to verify once more how bad it is. This very day I have been repeating over and over to myself a verbal jingle whose mawkish silliness was the secret of its haunting power. I loathed yet could not banish it.

Believers in the pleasure-and-pain theory must thus, if they are candid, make large exceptions in the application of their creed. Action from 'fixed ideas' is accordingly a terrible stumbling-block to the candid Professor Bain. Ideas have in his psychology no impulsive but only a 'guiding' function, whilst

"The proper stimulus of the will, namely, some variety of pleasure and pain, is needed to give the impetus.... The intellectual link is not sufficient for causing the deed to rise at the beck of the idea (except in case of an 'idée fixe');" but "should any *pleasure* spring up or be continued, by performing an action that we clearly conceive, the causation is then complete; both the directing and the moving powers are present."^[480]

Pleasures and pains are for Professor Bain the '*genuine* impulses of the will.'^[481]

"Without an antecedent of pleasurable or painful feeling—actual or ideal, primary or derivative—the will cannot be stimulated. Through all the disguises that wrap up what we call motives, something of one or other of these two grand conditions can be detected."^[482]

Accordingly, where Professor Bain finds an exception to this rule, he refuses to call the phenomenon a '*genuinely* voluntary impulse.' The exceptions, he admits, 'are those furnished by never-dying spontaneity, habits, and fixed ideas.'^[483] Fixed ideas 'traverse the proper course of volition.'^[484]

"*Disinterested impulses* are wholly distinct from the attainment of pleasure and the avoidance of pain.... The theory of disinterested action, in the only form that I can conceive it, supposes that the action of the will and the attainment of happiness do not square throughout."^[485]

Sympathy "has this in common with the Fixed Idea, that it clashes with the regular outgoings of the will in favor, of our pleasures."^[486]

Prof. Bain thus admits all the essential facts. Pleasure and pain are motives of only part of our activity. But he prefers to give to that part of the activity exclusively which these feelings prompt the name of '*regular* outgoings' and '*genuine* impulses' of the will,^[487] and to treat all the rest as mere paradoxes and anomalies, of which nothing rational can be said. This amounts to taking one species of a genus, calling it alone by the generic name, and ordering the other co-ordinate species to find what names they may. At bottom this is only verbal play. How much more conducive to clearness and insight it is to take the *genus* 'springs of action' and treat it as a whole; and then to distinguish within it the species 'pleasure and pain' from whatever other species may be found!

There is, it is true, a complication in the relation of pleasure to action, which partly excuses those who make it the exclusive spur. This complication deserves some notice at our hands.

An impulse which discharges itself immediately is generally quite *neutral* as regards pleasure or pain—the breathing impulse, for example. If such an impulse is arrested, however, by an extrinsic force, a great feeling of *uneasiness* is produced—for instance, the dyspnoea of asthma. And in proportion as the arresting force is then overcome, *relief* accrues—as when we draw breath again after the asthma subsides. The relief is a pleasure and the uneasiness a pain; and thus it happens that round all our impulses, merely as such, there twine, as it were, secondary possibilities of pleasant and painful feeling, involved in the manner in which the act is allowed to occur. These *pleasures and pains of achievement, discharge, or fruition* exist, no matter what the original spring of action be. We are glad when we have successfully got ourselves out of a danger, though the thought of the gladness was surely not what suggested to us to escape. To have compassed the steps towards a proposed sensual indulgence also makes us glad, and this gladness is a pleasure additional to the pleasure originally proposed. On the other hand, we are chagrined and displeased when any activity, however instigated, is hindered whilst in process of actual discharge. We are 'uneasy' till the discharge starts up again. And this is just as true when the action is neutral, or has nothing but pain in view as its result, as when it was undertaken for pleasure's express sake. The moth is probably as annoyed if hindered from getting into the lamp-flame as the *roué* is if interrupted in his debauch; and we are chagrined if prevented from doing some quite unimportant act which would have given us no noticeable pleasure if done, merely because the prevention itself is disagreeable.

Let us now call the pleasure *for the sake* of which the act may be done the *pursued pleasure*. It follows that, even when no pleasure is pursued by an act, the act itself may be the *pleasantest line* of conduct when once the impulse has begun, on account of the incidental pleasure which then attends its successful achievement and the pain which would come of interruption. A *pleasant act* and an act *pursuing a pleasure* are in themselves, however, two perfectly distinct conceptions, though they coalesce in one concrete phenomenon whenever a pleasure is deliberately pursued. I cannot help thinking that it is the *confusion of pursued pleasure with mere pleasure of*

achievement which makes the pleasure-theory of action so plausible to the ordinary mind. We feel an impulse, no matter whence derived; we proceed to act; if hindered, we feel displeasure; and if successful, relief. Action *in the line of the present impulse* is always for the time being the pleasant course; and the ordinary hedonist expresses this fact by saying that we act for the *sake* of the pleasantness involved. But who does not see that for this sort of pleasure to be possible, *the impulse must be there already as an independent fact*? The pleasure of successful performance is the *result* of the impulse, not its *cause*. You cannot have your pleasure of achievement unless you have managed to get your impulse under headway beforehand by some previous means.

It is true that on special occasions (so complex is the human mind) *the pleasure of achievement may itself become a pursued pleasure*; and these cases form another point on which the pleasure-theory is apt to rally. Take a foot-ball game or a fox-hunt. Who in cold blood wants the fox for its own sake, or cares whether the ball be at this goal or that? We know, however, by experience, that if we can once rouse a certain impulsive excitement in ourselves, whether to overtake the fox, or to get the ball to one particular goal, the successful venting of it over the counteracting checks will fill us with exceeding joy. We therefore get ourselves deliberately and artificially into the hot impulsive state. It takes the presence of various instinct-arousing conditions to excite it; but little by little, once we are in the field, it reaches its paroxysm; and we reap the reward of our exertions in that pleasure of successful achievement which, far more than the dead fox or the goal-got ball, was the object we originally pursued. So it often is with duties. Lots of actions are done with heaviness all through, and not till they are completed does pleasure emerge, in the joy of being done with them. Like Hamlet we say of each such successive task,

"O cursed spite,
That ever I was born to set it right!"

and then we often add to the original impulse that set us on, this additional one, that "we shall feel so glad when well through with it," that thought also having its impulsive spur. But because a pleasure of achievement *can* thus become a pursued pleasure upon occasion, it does not follow that everywhere and always that pleasure must be what is pursued. This, however, is what the pleasure-philosophers seem to suppose. As well might

they suppose, because no steamer can go to sea without incidentally consuming coal, and because some steamers may occasionally go to sea to *try* their coal, that therefore no steamer *can* go to sea for any other motive than that of coal-consumption.^[488]

As we need not act for the sake of gaining the pleasure of achievement, so neither need we act for the sake of escaping the uneasiness of arrest. This uneasiness is altogether due to the fact that the act is *already tending to occur* on other grounds. And these original grounds are what impel to its continuance, even though the uneasiness of the arrest may upon occasion add to their impulsive power.

To conclude, I am far from denying the exceeding prominence and importance of the part which pleasures and pains, both felt and represented, play in the motivation of our conduct. But I must insist that it is no exclusive part, and that co-ordinately with these mental objects innumerable others have an exactly similar impulsive and inhibitive power.^[489]

If one must have a single name for the condition upon which the impulsive and inhibitive quality of objects depends, one had better call it their *interest*. 'The interesting' is a title which covers not only the pleasant and the painful, but also the morbidly fascinating, the tediously haunting, and even the simply habitual, inasmuch as the attention usually travels on habitual lines, and what-we-attend-to and what-interests-us are synonymous terms. It seems as if we ought to look for the secret of an idea's impulsiveness, not in any peculiar relations which it may have with paths of motor discharge,—for *all* ideas have relations with some such paths,—but rather in a preliminary phenomenon, the *urgency, namely, with which it is able to compel attention and dominate in consciousness*. Let it once so dominate, let no other ideas succeed in displacing it, and whatever motor effects belong to it by nature will inevitably occur—its impulsion, in short, will be given to boot, and will manifest itself as a matter of course. This is what we have seen in instinct, in emotion, in common ideo-motor action, in hypnotic suggestion, in morbid impulsion, and in *voluntas invita*,—the impelling idea is simply the one which possesses the attention. It is the same where pleasure and pain are the motor spurs—they drive other thoughts from consciousness at the same time that they instigate their own characteristic 'volitional' effects. And this is also what happens at the moment of the *fiat*, in all the five types of 'decision' which we have described. In short, one

does not see any case in which the steadfast occupancy of consciousness does not appear to be the prime condition of impulsive power. It is still more obviously the prime condition of inhibitive power. What checks our impulses is the mere thinking of reasons to the contrary—it is their bare presence to the mind which gives the veto, and makes acts, otherwise seductive, impossible to perform. If we could only *forget* our scruples, our doubts, our fears, what exultant energy we should for a while display!

WILL IS A RELATION BETWEEN THE MIND AND ITS 'IDEAS.'

In closing in, therefore, after all these preliminaries, upon the more *intimate* nature of the volitional process, we find ourselves driven more and more exclusively to consider the conditions which make ideas prevail in the mind. With the prevalence, once there as a fact, of the motive idea the *psychology* of volition properly stops. The movements which ensue are exclusively physiological phenomena, following according to physiological laws upon the neural events to which the idea corresponds. The *willing* terminates with the prevalence of the idea; and whether the act then follows or not is a matter quite immaterial, so far as the willing itself goes. I will to write, and the act follows. I will to sneeze, and it does not. I will that the distant table slide over the floor towards me; it also does not. My willing representation can no more instigate my sneezing-centre than it can instigate the table to activity. But in both cases it is as true and good willing as it was when I willed to write.^[490] In a word, volition is a psychic or moral fact pure and simple, and is absolutely completed when the stable state of the idea is there. The supervention of motion is a supernumerary phenomenon depending on executive ganglia whose function lies outside the mind.

In St. Vitus' dance, in locomotor ataxy, the representation of a movement and the consent to it take place normally. But the inferior executive centres are deranged, and although the ideas discharge them, they do not discharge them so as to reproduce the precise sensations anticipated. In aphasia the patient has an image of certain words which he wishes to utter, but when he opens his mouth he hears himself making quite unintended sounds. This may fill him with rage and despair—which passions only show how intact his will remains. Paralysis only goes a step farther. The associated

mechanism is not only deranged but altogether broken through. The volition occurs, but the hand remains as still as the table. The paralytic is made aware of this by the absence of the expected change in his afferent sensations. He tries harder, i.e., he mentally frames the sensation of muscular 'effort,' with consent that it shall occur. It does so: he frowns, he heaves his chest, he clinches his other fist, but the palsied arm lies passive as before.^[491]

We thus find that *we reach the heart of our inquiry into volition when we ask by what process it is that the thought of any given object comes to prevail stably in the mind.* Where thoughts prevail without effort, we have sufficiently studied in the several chapters on sensation, association, and attention, the laws of their advent before consciousness and of their stay. We will not go over that ground again, for we know that interest and association are the words, let their worth be what it may, on which our explanations must perforce rely. Where, on the other hand, the prevalence of the thought is accompanied by the phenomenon of effort, the case is much less clear. Already in the chapter on attention we postponed the final consideration of voluntary attention with effort to a later place. We have now brought things to a point at which we see that attention with effort is all that any case of volition implies. *The essential achievement of the will, in short, when it is most 'voluntary,' is to ATTEND to a difficult object and hold it fast before the mind.* The so-doing is the fiat; and it is a mere physiological incident that when the object is thus attended to, immediate motor consequences should ensue. A *resolve*, whose contemplated motor consequences are not to ensue until some possibly far distant future condition shall have been fulfilled, involves all the psychic elements of a motor fiat except the word 'now;' and it is the same with many of our purely theoretic beliefs. We saw in effect in the appropriate chapter, how in the last resort belief means only a peculiar sort of occupancy of the mind, and relation to the self felt in the thing believed; and we know in the case of many beliefs how constant an effort of the attention is required to keep them in this situation and protect them from displacement by contradictory ideas.^[492] (Compare above, [p. 321.](#))

Effort of attention is thus the essential phenomenon of will.^[493] Every reader must know by his own experience that this is so, for every reader must have felt some fiery passion's grasp. What constitutes the difficulty for

a man laboring under an unwise passion of acting as if the passion were unwise? Certainly there is no physical difficulty. It is as easy physically to avoid a fight as to begin one, to pocket one's money as to squander it on one's cupidities, to walk away from as towards a coquette's door. The difficulty is mental; it is that of getting the idea of the wise action to stay before our mind at all. When any strong emotional state whatever is upon us the tendency is for no images but such as are congruous with it to come up. If others by chance offer themselves, they are instantly smothered and crowded out. If we be joyous, we cannot keep thinking of those uncertainties and risks of failure which abound upon our path; if lugubrious, we cannot think of new triumphs, travels, loves, and joys; nor if vengeful, of our oppressor's community of nature with ourselves. The cooling advice which we get from others when the fever-fit is on us is the most jarring and exasperating thing in life. Reply we cannot, so we get angry; for by a sort of self-preserving instinct which our passion has, it feels that these chill objects, if they once but gain a lodgment, will work and work until they have frozen the very vital spark from out of all our mood and brought our airy castles in ruin to the ground. Such is the inevitable effect of reasonable ideas over others—if *they can once get a quiet hearing*; and passion's cue accordingly is always and everywhere to prevent their still small voice from being heard at all. "Let me not think of that! Don't speak to me of that!" This is the sudden cry of all those who in a passion perceive some sobering considerations about to check them in mid-career. "*Hæc tibi erit janua leti*," we feel. There is something so icy in this cold-water bath, something which seems so hostile to the movement of our life, so purely negative, in Reason, when she lays her corpse-like finger on our heart and says, "Halt! give up! leave off! go back! sit down!" that it is no wonder that to most men the steadying influence seems, for the time being, a very minister of death.

The strong-willed man, however, is the man who hears the still small voice unflinchingly, and who, when the death-bringing consideration comes, looks at its face, consents to its presence, clings to it, affirms it, and holds it fast, in spite of the host of exciting mental images which rise in revolt against it and would expel it from the mind. Sustained in this way by a resolute effort of attention, the difficult object ere long begins to call up its own congeners and associates and ends by changing the disposition of the man's consciousness altogether. And with his consciousness, his action changes, for the new object, once stably in possession of the field of his

thoughts, infallibly produces its own motor effects. The difficulty lies in the gaining possession of that field. Though the spontaneous drift of thought is all the other way, the attention must be kept strained on that one object until at last it *grows*, so as to maintain itself before the mind with ease. This strain of the attention is the fundamental act of will. And the will's work is in most cases practically ended when the bare presence to our thought of the naturally unwelcome object has been secured. For the mysterious tie between the thought and the motor centres next comes into play, and, in a way which we cannot even guess at, the obedience of the bodily organs follows as a matter of course.

In all this one sees how the immediate point of application of the volitional effort lies exclusively in the mental world. The whole drama is a mental drama. The whole difficulty is a mental difficulty, a difficulty with an object of our thought. If I may use the word *idea* without suggesting associationist or Herbartian fables, I will say that it is an idea to which our will applies itself, an idea which if we let it go would slip away, but which we will not let go. Consent to the idea's undivided presence, this is effort's sole achievement. Its only function is to get this feeling of consent into the mind. And for this there is but one way. The idea to be consented to must be kept from flickering and going out. It must be held steadily before the mind until it *fills* the mind. Such filling of the mind by an idea, with its congruous associates, *is* consent to the idea and to the fact which the idea represents. If the idea be that, or include that, of a bodily movement of our own, then we call the consent thus laboriously gained a motor volition. For Nature here 'backs' us instantaneously and follows up our inward willingness by outward changes on her own part. She does this in no other instance. Pity she should not have been more generous, nor made a world whose other parts were as immediately subject to our will!

On [page 531](#), in describing the 'reasonable type' of decision, it was said that it usually came when the right conception of the case was found. Where, however, the right conception is an anti-impulsive one, the whole intellectual ingenuity of the man usually goes to work to crowd it out of sight, and to find names for the emergency, by the help of which the

dispositions of the moment may sound sanctified, and sloth or passion may reign unchecked. How many excuses does the drunkard find when each new temptation comes! It is a new brand of liquor which the interests of intellectual culture in such matters oblige him to test; moreover it is poured out and it is sin to waste it; or others are drinking and it would be churlishness to refuse; or it is but to enable him to sleep, or just to get through this job of work; or it isn't drinking, it is because he feels so cold; or it is Christmas-day; or it is a means of stimulating him to make a more powerful resolution in favor of abstinence than any he has hitherto made; or it is just this once, and once doesn't count, etc., etc., *ad libitum*—it is, in fact, anything you like except *being a drunkard*. That is the conception that will not stay before the poor soul's attention. But if he once gets able to pick out that way of conceiving, from all the other possible ways of conceiving the various opportunities which occur, if through thick and thin he holds to it that this is being a drunkard and is nothing else, he is not likely to remain one long. The effort by which he succeeds in keeping the right *name* unwaveringly present to his mind proves to be his saving moral act.^[494]

Everywhere then the function of the effort is the same: to keep affirming and adopting a thought which, if left to itself, would slip away. It may be cold and flat when the spontaneous mental drift is towards excitement, or great and arduous when the spontaneous drift is towards repose. In the one case the effort has to inhibit an explosive, in the other to arouse an obstructed will. The exhausted sailor on a wreck has a will which is obstructed. One of his ideas is that of his sore hands, of the nameless exhaustion of his whole frame which the act of farther pumping involves, and of the deliciousness of sinking into sleep. The other is that of the hungry sea engulfing him. "Rather the aching toil!" he says; and it becomes reality then, in spite of the inhibiting influence of the relatively luxurious sensations which he gets from lying still. But exactly similar in form would be his consent to lie and sleep. Often it is the thought of sleep and what leads to it which is the hard one to keep before the mind. If a patient afflicted with insomnia can only control the whirling chase of his thoughts so far as to think of *nothing at all* (which can be done), or so far as to imagine one letter after another of a verse of scripture or poetry spelt slowly and monotonously out, it is almost certain that here, too, specific bodily effects will follow, and that sleep will come. The trouble is to keep the mind upon a train of objects naturally so insipid. *To sustain a representation, to*

think, is, in short, the only moral act, for the impulsive and the obstructed, for sane and lunatics alike. Most maniacs know their thoughts to be crazy, but find them too pressing to be withstood. Compared with them the sane truths are so deadly sober, so cadaverous, that the lunatic cannot bear to look them in the face and say, "Let these alone be my reality!" But with sufficient effort, as Dr. Wigan says,

"Such a man can for a time *wind himself up*, as it were, and determine that the notions of the disordered brain shall not be manifested. Many instances are on record similar to that told by Pinel, where an inmate of the Bicêtre, having stood a long cross-examination, and given every mark of restored reason, signed his name to the paper authorizing his discharge 'Jesus Christ,' and then went off into all the vagaries connected with that delusion. In the phraseology of the gentleman whose case is related in an early part of this [Wigan's] work he had 'held himself tight' during the examination in order to attain his object; this once accomplished he 'let himself down' again, and, if even *conscious* of his delusion, could not control it. I have observed with such persons that it requires a considerable time to wind themselves up to the pitch of complete self-control, that the effort is a painful tension of the mind.... When thrown off their guard by any accidental remark or worn out by the length of the examination, they *let themselves go*, and cannot gather themselves up again without preparation. Lord Erskine relates the story of a man who brought an action against Dr. Munro for confining him without cause. He underwent the most rigid examination by the counsel for the defendant without discovering any appearance of insanity, till a gentleman asked him about a princess with whom he corresponded in cherry-juice, and he became instantly insane."^[495]

To sum it all up in a word, *the terminus of the psychological process in volition, the point to which the will is directly applied, is always an idea*. There are at all times *some* ideas from which we shy away like frightened horses the moment we get a glimpse of their forbidding profile upon the threshold of our thought. *The only resistance which our will can possibly experience is the resistance which such an idea offers to being attended to*

at all. To attend to it is the volitional act, and the only inward volitional act which we ever perform.

I have put the thing in this ultra-simple way because I want more than anything else to emphasize the fact that volition is primarily a relation, not between our Self and extra-mental matter (as many philosophers still maintain) but between our Self and our own states of mind. But when, a short while ago, I spoke of the filling of the mind with an idea as being equivalent to consent to the idea's object, I said something which the reader doubtless questioned at the time, and which certainly now demands some qualification ere we pass beyond.

It is unqualifiedly true that if any thought *do* fill the mind exclusively, such filling is consent. The thought, for that time at any rate, carries the man and his will with it. But it is not true that the thought *need* fill the mind exclusively for consent to be there; for we often consent to things whilst thinking of other things, even of hostile things; and we saw in fact that precisely what distinguishes our 'fifth type' of decision from the other types (see [p. 534](#)) is just this coexistence with the triumphant thought of other thoughts which would inhibit it but for the effort which makes it prevail. The effort to *attend* is therefore only a part of what the word 'will' covers; it covers also the effort to *consent* to something to which our attention is not quite complete. Often, when an object has gained our attention exclusively, and its motor results are just on the point of setting in, it seems as if the sense of their imminent irrevocability were enough of itself to start up the inhibitory ideas and to make us pause. Then we need a new stroke of effort to break down the sudden hesitation which seizes upon us, and to persevere. So that although attention is the first and fundamental thing in volition, *express consent to the reality of what is attended to* is often an additional and quite distinct phenomenon involved.

The reader's own consciousness tells him of course just what these words of mine denote. And I freely confess that I am impotent to carry the analysis of the matter any farther, or to explain in other terms of what this consent consists. It seems a subjective experience *sui generis*, which we can designate but not define. We stand here exactly where we did in the case of

belief. When an idea *stings* us in a certain way, makes as it were a certain electric connection with our self, we believe that it *is* a reality. When it stings us in another way, makes another connection with our Self, we say, *let it be* a reality. To the word 'is' and to the words 'let it be' there correspond peculiar attitudes of consciousness which it is vain to seek to explain. The indicative and the imperative moods are as much ultimate categories of thinking as they are of grammar. The 'quality of reality' which these moods attach to things is not like other qualities. It is a relation to our life. It means *our* adoption of the things, *our* caring for them, *our* standing by them. This at least is what it practically means for us; what it may mean beyond that we do not know. And the transition from merely considering an object as possible, to deciding or willing it to be real; the change from the fluctuating to the stable personal attitude concerning it; from the 'don't care' state of mind to that in which 'we mean business,' is one of the most familiar things in life. We can partly enumerate its conditions; and we can partly trace its consequences, especially the momentous one that when the mental object is a movement of our own body, it realizes itself outwardly when the mental change in question has occurred. But the change itself as a subjective phenomenon is something which we can translate into no simpler terms.

THE QUESTION OF 'FREE-WILL.'

Especially must we, when talking about it, rid our mind of the fabulous warfare of separate agents called 'ideas.' The brain-processes may be agents, and the thought as such may be an agent. But what the ordinary psychologies call 'ideas' are nothing but parts of the total *object* of representation. All that is before the mind at once, no matter how complex a system of things and relations it may be, is one object for the thought. Thus, 'A-and-B-and-their-mutual-incompatibility-and-the-fact-that-only-one-can-be-true-or-can-become-real-notwithstanding-the-probability-or-desirability-of-both' may be such a complex object; and where the thought is deliberative its object has always some such form as this. When, now, we pass from deliberation to decision, that total object undergoes a change. We either dismiss A altogether and its relations to B, and think of B exclusively; or after thinking of both as possibilities, we next think that A is impossible, and that B is or forthwith shall be real. In either case a *new* object is before our thought; and where effort exists, it is where the change

from the first object to the second one is hard. Our thought seems to turn in this case like a heavy door on rusty hinges; only, so far as the effort feels spontaneous, it turns, not as if by some one helping, but as if by an inward activity, born for the occasion, of its own.

The psychologists who discussed 'the muscular sense' at the international congress at Paris in 1889 agreed at the end that they needed to come to a better understanding in regard to this appearance of internal activity at the moment when a decision is made. M. Fouillée, in an article which I find more interesting and suggestive than coherent or conclusive,^[496] seems to resolve our sense of activity into that of our very *existence as thinking entities*. At least so I translate his words.^[497] But we saw in Chapter X how hard it is to lay a verifying finger plainly upon the thinking process as such, and to distinguish it from certain objects of the stream. M. Fouillée admits this; but I do not think he fully realizes how strong would be the position of a man who should suggest (see Vol. I. p. 301) that the feeling of moral activity itself which accompanies the advent of certain 'objects' before the mind is nothing but certain other objects,—constrictions, namely, in the brows, eyes, throat, and breathing apparatus, present then, but absent from other pulses of subjective change. Were this the truth, then a part, at any rate, of the activity of which we become aware in effort would seem merely to be that of our body; and many thinkers would probably thereupon conclude that this 'settles the claims' of inner activity, and dismisses the whole notion of such a thing as a superfluity in psychological science.

I cannot see my way to so extreme a view; even although I must repeat the confession made on pp. 296-7 of Vol. I, that I do not *fully* understand how we come to our unshakable belief that thinking exists as a special kind of immaterial process alongside of the material processes of the world. It is certain, however, that only by *postulating* such thinking do we make things currently intelligible; and it is certain that no psychologist has as yet denied the *fact* of thinking, the utmost that has been denied being its dynamic power. But if we postulate the fact of the thinking at all, I believe that we must postulate its power as well; nor do I see how we can rightly equalize its power with its mere existence, and say (as M. Fouillée seems to say) that for the thought-process to *go on at all* is an activity, and an activity everywhere the same; for certain steps forward in this process seem *prima facie* to be passive, and other steps (as where an object comes with effort)

seem *prima facie* to be active in a supreme degree. If we admit, therefore, that our thoughts *exist*, we ought to admit that they exist after the fashion in which they appear, as things, namely, that supervene upon each other, sometimes with effort and sometimes with ease; the only questions being, is the effort where it exists a fixed function of the *object*, which the latter imposes on the thought? or is it such an independent 'variable' that with a constant object more or less of it may be made?

It certainly appears to us indeterminate, and as if, even with an unchanging object, we might make more or less, as we choose. If it be really indeterminate, our future acts are ambiguous or unpredestinate: in common parlance, *our wills are free*. If the amount of effort be not indeterminate, but be related in a fixed manner to the objects themselves, in such wise that whatever object at any time fills our consciousness was from eternity bound to fill it then and there, and compel from us the exact effort, neither more nor less, which we bestow upon it,—then our wills are not free, and all our acts are foreordained. *The question of fact in the free-will controversy is thus extremely simple*. It relates solely to the amount of effort of attention or consent which we can at any time put forth. Are the duration and intensity of this effort fixed functions of the object, or are they not? Now, as I just said, it *seems* as if the effort were an independent variable, as if we might exert more or less of it in any given case. When a man has let his thoughts go for days and weeks until at last they culminate in some particularly dirty or cowardly or cruel act, it is hard to persuade him, in the midst of his remorse, that he might not have reined them in; hard to make him believe that this whole goodly universe (which his act so jars upon) required and exacted it of him at that fatal moment, and from eternity made aught else impossible. But, on the other hand, there is the certainty that all his *effortless* volitions are resultants of interests and associations whose strength and sequence are mechanically determined by the structure of that physical mass, his brain; and the general continuity of things and the monistic conception of the world may lead one irresistibly to postulate that a little fact like effort can form no real exception to the overwhelming reign of deterministic law. Even in effortless volition we have the consciousness of the alternative being also possible. This is surely a delusion here; why is it not a delusion everywhere?

My own belief is that the question of free-will is insoluble on strictly psychologic grounds. After a certain amount of effort of attention has been given to an idea, it is manifestly impossible to tell whether either more or less of it *might* have been given or not. To tell that, we should have to ascend to the antecedents of the effort, and defining them with mathematical exactitude, prove, by laws of which we have not at present even an inkling, that the only amount of sequent effort which could *possibly* comport with them was the precise amount which actually came. Measurements, whether of psychic or of neural quantities, and deductive reasonings such as this method of proof implies, will surely be forever beyond human reach. No serious psychologist or physiologist will venture even to suggest a notion of how they might be practically made. We are thrown back therefore upon the crude evidences of introspection on the one hand, with all its liabilities to deception, and, on the other hand, upon *a priori* postulates and probabilities. He who loves to balance nice doubts need be in no hurry to decide the point. Like Mephistopheles to Faust, he can say to himself, "*dazu hast du noch eine lange Frist*," for from generation to generation the reasons adduced on both sides will grow more voluminous, and the discussion more refined. But if our speculative delight be less keen, if the love of a *parti pris* outweighs that of keeping questions open, or if, as a French philosopher of genius says, "*l'amour de la vie qui s'indigne de tant de discours*," awakens in us, craving the sense of either peace or power,—then, taking the risk of error on our head, we must project upon one of the alternative views the attribute of reality for us; we must so fill our mind with the idea of it that it becomes our settled creed. The present writer does this for the alternative of freedom, but since the grounds of his opinion are ethical rather than psychological, he prefers to exclude them from the present book. ^[498]

A few words, however, may be permitted about the logic of the question. The most that any argument can do for determinism is to make it a clear and seductive conception, which a man is foolish not to espouse, so long as he stands by the great scientific postulate that the world must be one unbroken fact, and that prediction of all things without exception must be ideally,

even if not actually, possible. It is a *moral* postulate about the Universe, the postulate that *what ought to be can be, and that bad acts cannot be fated, but that good ones must be possible in their place*, which would lead one to espouse the contrary view. But when scientific and moral postulates war thus with each other and objective proof is not to be had, the only course is voluntary choice, for scepticism itself, if systematic, is also voluntary choice. If, meanwhile, the will *be* undetermined, it would seem only fitting that the belief in its indetermination should be voluntarily chosen from amongst other possible beliefs. Freedom's first deed should be to affirm itself. We ought never to hope for any other method of getting at the truth if indeterminism be a fact. Doubt of this particular truth will therefore probably be open to us to the end of time, and the utmost that a believer in free-will can *ever* do will be to show that the deterministic arguments are not coercive. That they are seductive, I am the last to deny; nor do I deny that effort may be needed to keep the faith in freedom, when they press upon it, upright in the mind.

There is a *fatalistic argument* for determinism, however, which is radically vicious. When a man has let himself go time after time, he easily becomes impressed with the enormously preponderating influence of circumstances, hereditary habits, and temporary bodily dispositions over what might seem a spontaneity born for the occasion. "All is fate," he then says; "all is resultant of what pre-exists. Even if the moment seems original, it is but the instable molecules passively tumbling in their preappointed way. It is hopeless to resist the drift, vain to look for any new force coming in; and less, perhaps, than anywhere else under the sun is there anything really mine in the decisions which I make." This is really no argument for simple determinism. There runs throughout it the sense of a force which might make things otherwise from one moment to another, if it were only strong enough to breast the tide. A person who feels the *impotence* of free effort in this way has the acutest notion of what is meant by it, and of its possible independent power. How else could he be so conscious of its absence and of that of its effects? But genuine determinism occupies a totally different ground; not the *impotence* but the *unthinkability* of free-will is what it affirms. It admits something phenomenal *called* free effort, which *seems* to breast the tide, but it claims this as a *portion of the tide*. The variations of the effort cannot be independent, it says; they cannot originate *ex nihilo*, or come from a fourth dimension; they are mathematically fixed functions of

the ideas themselves, which are the tide. Fatalism, which conceives of effort clearly enough as an independent variable that might come from a fourth dimension if it *would* come, but that does *not* come, is a very dubious ally for determinism. It strongly imagines that very possibility which determinism denies.

But what, quite as much as the inconceivability of absolutely independent variables, persuades modern men of science that their efforts must be predetermined, is the continuity of the latter with other phenomena whose predetermination no one doubts. Decisions with effort merge so gradually into those without it that it is not easy to say where the limit lies. Decisions without effort merge again into ideo-motor, and these into reflex acts; so that the temptation is almost irresistible to throw the formula which covers so many cases over absolutely all. Where there is effort just as where there is none, the ideas themselves which furnish the matter of deliberation are brought before the mind by the machinery of association. And this machinery is essentially a system of arcs and paths, a reflex system, whether effort be amongst its incidents or not. The reflex way is, after all, the universal way of conceiving the business. The feeling of *ease* is a passive result of the way in which the thoughts unwind themselves. Why is not the feeling of effort the same? Professor Lipps, in his admirably clear deterministic statement, so far from admitting that the feeling of effort testifies to an increment of force exerted, explains it as a sign that force is lost. We speak of effort, according to him, whenever a force expends itself (wholly or partly) in neutralizing another force, and so fails of its own possible outward effect. The outward effect of the antagonistic force, however, also fails in corresponding measure, "so that there is no effort without counter-effort,... and effort and counter-effort signify only that causes are mutually robbing each other of effectiveness."^[499] Where the forces are ideas, both sets of them, strictly speaking, are the seat of effort—both those which tend to explode, and those which tend to check them. We, however, call the more abundant mass of ideas *ourselves*; and, talking of its effort as *our* effort, and of that of the smaller mass of ideas as the *resistance*,^[500] we say that our effort sometimes overcomes the resistances offered by the inertias of an obstructed, and sometimes those presented by the impulsions of an explosive, will. Really both effort and resistance are ours, and the identification of our *self* with one of these factors is an illusion

and a trick of speech. I do not see how anyone can fail (especially when the mythologic dynamism of separate 'ideas,' which Professor Lipps cleaves to, is translated into that of brain-processes) to recognize the fascinating simplicity of some such view as his. Nor do I see why *for scientific purposes* one need give it up even if indeterminate amounts of effort really do occur. Before their indeterminism, science simply *stops*. She can abstract from it altogether, then; for in the impulses and inhibitions with which the effort has to cope there is already a larger field of uniformity than she can ever practically cultivate. Her prevision will never foretell, even if the effort be completely predestinate, the actual way in which each individual emergency is resolved. Psychology will be Psychology,^[501] and Science Science, as much as ever (as much and no more) in this world, whether free will be true in it or not. Science, however, must be constantly reminded that her purposes are not the only purposes, and that the order of uniform causation which she has use for, and is therefore right in postulating, may be enveloped in a wider order, on which she has no claims at all.

We can therefore leave the free-will question altogether out of our account. As we said in Chapter VI (vol. I. p. 453), the operation of free effort, if it existed, could only be to hold some one ideal object, or part of an object, a little longer or a little more intensely before the mind. Amongst the alternatives which present themselves as *genuine possibles*, it would thus make one effective.^[502] And although such quickening of one idea might be *morally and historically momentous*, yet, if considered *dynamically*, it would be an operation amongst those physiological infinitesimals which calculation must forever neglect.

But whilst eliminating the question about the amount of our effort as one which psychology will never have a practical call to decide, I must say one word about the extraordinarily intimate and important character which the phenomenon of effort assumes in our own eyes as individual men. Of course we measure ourselves by many standards. Our strength and our intelligence, our wealth and even our good luck, are things which warm our heart and make us feel ourselves a match for life. But deeper than all such things, and able to suffice unto itself without them, is the sense of the amount of effort which we can put forth. Those are, after all, but effects, products, and reflections of the outer world within. But the effort seems to belong to an altogether different realm, as if it were the substantive thing

which we *are*, and those were but externals which we *carry*. If the 'searching of our heart and reins' be the purpose of this human drama, then what is sought seems to be what effort we can make. He who can make none is but a shadow; he who can make much is a hero. The huge world that girdles us about puts all sorts of questions to us, and tests us in all sorts of ways. Some of the tests we meet by actions that are easy, and some of the questions we answer in articulately formulated words. But the deepest question that is ever asked admits of no reply but the dumb turning of the will and tightening of our heartstrings as we say, "*Yes, I will even have it so!*" When a dreadful object is presented, or when life as a whole turns up its dark abysses to our view, then the worthless ones among us lose their hold on the situation altogether, and either escape from its difficulties by averting their attention, or if they cannot do that, collapse into yielding masses of plaintiveness and fear. The effort required for facing and consenting to such objects is beyond their power to make. But the heroic mind does differently. To it, too, the objects are sinister and dreadful, unwelcome, incompatible with wished-for things. But it can face them if necessary, without for that losing its hold upon the rest of life. The world thus finds in the heroic man its worthy match and mate; and the effort which he is able to put forth to hold himself erect and keep his heart unshaken is the direct measure of his worth and function in the game of human life. He can *stand* this Universe. He can meet it and keep up his faith in it in presence of those same features which lay his weaker brethren low. He can still find a zest in it, not by 'ostrich-like forgetfulness,' but by pure inward willingness to face the world with those deterrent objects there. And hereby he becomes one of the masters and the lords of life. He must be counted with henceforth; he forms a part of human destiny. Neither in the theoretic nor in the practical sphere do we care for, or go for help to, those who have no head for risks, or sense for living on the perilous edge. Our religious life lies more, our practical life lies less, than it used to, on the perilous edge. But just as our courage is so often a reflex of another's courage, so our faith is apt to be, as Max Müller somewhere says, a faith in some one else's faith. We draw new life from the heroic example. The prophet has drunk more deeply than anyone of the cup of bitterness, but his countenance is so unshaken and he speaks such mighty words of cheer that his will becomes our will, and our life is kindled at his own.

Thus not only our morality but our religion, so far as the latter is deliberate, depend on the effort which we can make. "*Will you or won't you have it so?*" is the most probing question we are ever asked; we are asked it every hour of the day, and about the largest as well as the smallest, the most theoretical as well as the most practical, things. We answer by *consents or non-consents* and not by words. What wonder that these dumb responses should seem our deepest organs of communication with the nature of things! What wonder if the effort demanded by them be the measure of our worth as men! What wonder if the amount which we accord of it be the one strictly underived and original contribution which we make to the world!

THE EDUCATION OF THE WILL.

The education of the will may be taken in a broader or a narrower sense. In the broader sense, it means the whole of one's training to moral and prudential conduct, and of one's learning to adapt means to ends, involving the 'association of ideas,' in all its varieties and complications, together with the power of inhibiting impulses irrelevant to the ends desired, and of initiating movements contributory thereto. It is the acquisition of these latter powers which I mean by the education of the will in the narrower sense. And it is in this sense alone that it is worth while to treat the matter here. [503]

Since a willed movement is a movement preceded by an idea of itself, the problem of the will's education is the problem of how the idea of a movement can arouse the movement itself. This, as we have seen, is a secondary kind of process; for framed as we are, we can have no *a priori* idea of a movement, no idea of a movement which we have not already performed. Before the idea can be generated, the movement must have occurred in a blind, unexpected way, and left its idea behind. *Reflex, instinctive, or random execution* of a *movement* must, in other words, precede its voluntary execution. Reflex and instinctive movements have already been considered sufficiently for the purposes of this book. 'Random' movements are mentioned so as to include *quasi-accidental* reflexes from inner causes, or movements possibly arising from such overflow of nutrition in special centres as Prof. Bain postulates in his explanation of

those 'spontaneous discharges' by which he sets such great store in his derivation of the voluntary life.^[504]

Now *how can the sensory process which a movement has previously produced, discharge, when excited again, into the centre for the movement itself?* On the movement's original occurrence the motor discharge came first and the sensory process second; now in the voluntary repetition the sensory process (excited in weak or 'ideational' form) comes first, and the motor discharge comes second. To tell how this comes to pass would be to answer the problem of the education of the will in physiological terms. Evidently the problem is that of the formation of *new paths*; and the only thing to do is to make hypotheses, till we find some which seem to cover all the facts.

How is a fresh path ever formed? All paths are paths of discharge, and the discharge always takes place in the direction of least resistance, whether the cell which discharges be 'motor' or 'sensory.' The *connate* paths of least resistance are the paths of instinctive reaction; and I submit as my first hypothesis that *these paths all run one way, that is from 'sensory' cells into 'motor' cells and from motor cells into muscles, without ever taking the reverse direction.* A motor cell, for example, never awakens a sensory cell directly, but only through the incoming current caused by the bodily movements to which its discharge gives rise. And a sensory cell *always* discharges or normally tends to discharge towards the motor region. Let this direction be called the 'forward' direction. I call the law an hypothesis, but really it is an indubitable truth. No impression or idea of eye, ear, or skin comes to us without occasioning a movement, even though the movement be no more than the accommodation of the sense-organ; and all our trains of sensation and sensational imagery have their terms alternated and interpenetrated with motor processes, of most of which we practically are unconscious. Another way of stating the rule is to say that, primarily or connately, all currents through the brain run towards the Rolandic region, and that there they run out, and never return upon themselves. From this point of view the distinction of sensory and motor cells has no fundamental significance. All cells are motor; we simply call those of the Rolandic region, those nearest the mouth of the funnel, the motor cells *par excellence*.

A corollary of this law is that 'sensory' cells do not awaken each other connately; that is, that no one sensible property of things has any tendency, in advance of experience, to awaken in us the idea of any other sensible properties which in the nature of things may go with it. *There is no a priori calling up of one 'idea' by another;* the only *a priori* couplings are of ideas with movements. All suggestions of one sensible fact by another take place by secondary paths which experience has formed.

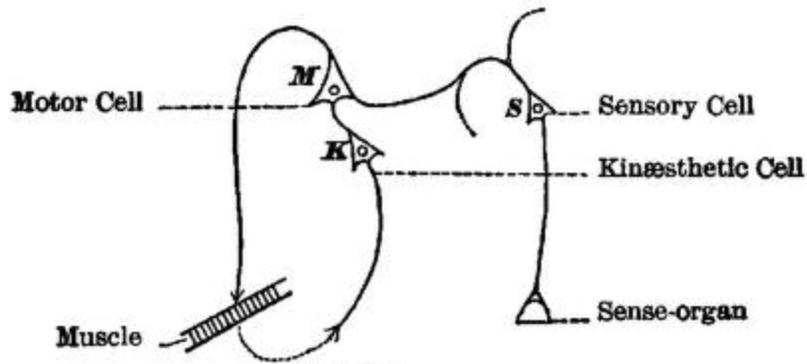


FIG. 87.

The diagram (Fig. 87)^[505] shows what happens in a nervous system ideally reduced to the fewest possible terms. A stimulus reaching the sense-organ awakens the sensory cell, S; this by the connate or instinctive path discharges the motor cell, M, which makes the muscle contract; and the contraction arouses the second sensory cell, K, which may be the organ either of a 'resident' or 'kinæsthetic,' or of a 'remote,' sensation. (See above, [p. 488.](#)) This cell K again discharges into M. If this were the entire nervous mechanism, the movement, once begun, would be self-maintaining, and would stop only when the parts were exhausted. And this, according to M. Pierre Janet, is what actually happens in *catalepsy*. A cataleptic patient is anæsthetic, speechless, motionless. Consciousness, so far as we can judge, is abolished. Nevertheless the limbs will retain whatever position is impressed upon them from without, and retain it so long that if it be a strained and unnatural position, the phenomenon is regarded by Charcot as one of the few conclusive tests against hypnotic subjects shamming, since hypnotics can be made cataleptic, and then keep their limbs outstretched for a length of time quite unattainable by the waking will. M. Janet thinks that in all these cases the outlying ideational processes in the brain are temporarily thrown out of gear. The kinæsthetic sensation of the raised arm, for example, is produced in the patient when the operator raises the arm, this sensation discharges into the motor cell, which through the muscle reproduces the sensation, etc., the currents running in this closed circle until they grow so weak, by exhaustion of the parts, that the member slowly drops. We may call this circle from the muscle to K, from K to M, and from M to the muscle again, the 'motor circle.' *We should all be cataleptics and never stop a muscular contraction once begun, were it not that other processes simultaneously going on inhibit the contraction. Inhibition is*

therefore not an occasional accident; it is an essential and unremitting element of our cerebral life. It is interesting to note that Dr. Mercier, by a different path of reasoning, is also led to conclude that we owe to outside inhibitions exclusively our power to arrest a movement once begun.^[506]

One great inhibitor of the discharge of K into M seems to be the painful or otherwise displeasing quality of the sensation itself of K; and conversely, when this sensation is distinctly pleasant, that fact tends to further K's discharge into M, and to keep the primordial motor circle agoing. Tremendous as the part is which pleasure and pain play in our psychic life, we must confess that absolutely nothing is known of their cerebral conditions. It is hard to imagine them as having special centres; it is harder still to invent peculiar forms of process in each and every centre, to which these feelings may be due. And let one try as one will to represent the cerebral activity in exclusively mechanical terms, I, for one, find it quite impossible to enumerate what seem to be the facts and yet to make no mention of the psychic side which they possess. However it be with other drainage currents and discharges, the drainage currents and discharges of the brain are not purely physical facts. They are *psycho-physical* facts, and the spiritual quality of them seems a codeterminant of their mechanical effectiveness. If the mechanical activities in a cell, as they increase, give pleasure, they seem to increase all the more rapidly for that fact; if they give displeasure, the displeasure seems to damp the activities. The psychic side of the phenomenon thus seems, somewhat like the applause or hissing at a spectacle, to be an encouraging or adverse *comment* on what the machinery brings forth. The soul *presents* nothing herself; *creates* nothing; is at the mercy of the material forces for all *possibilities*; but amongst these possibilities she *selects*; and by reinforcing one and checking others, she figures not as an 'epiphenomenon,' but as something from which the play gets moral support. I shall therefore never hesitate to invoke the efficacy of the conscious comment, where no strictly mechanical reason appears why a current escaping from a cell should take one path rather than another.^[507] But the *existence* of the current, and its *tendency* towards either path, I feel bound to account for by mechanical laws.

Having now considered a nervous system reduced to its lowest possible terms, in which all the paths are connate, and the possibilities of inhibition not extrinsic, but due solely to the agreeableness or disagreeableness of the feeling aroused, let us turn to the conditions under which new paths may be formed. Potentialities of new paths are furnished by the fibres which connect the sensory cells amongst themselves; but these fibres are not originally pervious, and have to be made so by a process which I proceed hypothetically to state as follows: *Each discharge from a sensory cell in the forward direction^[508] tends to drain the cells lying behind the discharging one of whatever tension they may possess. The drainage from the rearward cells is what for the first time makes the fibres pervious. The result is a new-formed 'path,' running from the cells which were 'rearward' to the cell which was 'forward' on that occasion; which path, if on future occasions the rearward cells are independently excited, will tend to carry off their activity in the same direction so as to excite the forward cell, and will deepen itself more and more every time it is used.*

Now the 'rearward cells,' so far, stand for all the sensory cells of the brain other than the one which is discharging; but such an indefinitely broad path would practically be no better than no path, so here I make a third hypothesis, which, taken together with the others, seems to me to cover all the facts. It is that *the deepest paths are formed from the most drainable to the most draining cells; that the most drainable cells are those which have just been discharging, and that the most draining cells are those which are now discharging or in which the tension is rising towards the point of discharge.*^[509] Another diagram, Fig. 88, will make the matter clear.

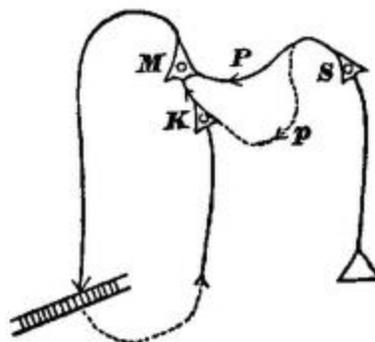


FIG. 88.

Take the operation represented by the previous diagram at the moment when, the muscular contraction having occurred, the cell K is discharging forward into M. Through the dotted line *p* it will, according to our third hypothesis, drain S (which, in the supposed case, has just discharged into M by the connate path P, and caused the muscular contraction), and the result is that *p* will now remain as a new path open from S to K. When next S is excited from without it will tend not only to discharge into M, but into K as well. K thus gets excited directly by S *before* it gets excited by the incoming current from the muscle; or, translated into psychic terms: *when a sensation has once produced a movement in us, the next time we have the sensation, it tends to suggest the idea of the movement, even before the movement occurs.* [510]

The same principles also apply to the relations of K and M. M, lying in the forward direction, drains K, and the path KM, even though it be no primary or connate path, becomes a secondary or habitual one. Hereafter K may be aroused in any way whatsoever (not as before from S or from without) and still it will tend to discharge into M; or, to express it again in psychic terms, *the idea of the movement M's sensory effects will have become an immediately antecedent condition to the production of the movement itself.*

Here, then, we have the answer to our original question of how a sensory process which, the first time it occurred, was the effect of a movement, can later figure as the movement's cause.

It is obvious on this scheme that the cell which we have marked K may stand for the seat of either a resident or a remote sensation occasioned by the motor discharge. It may indifferently be a tactile, a visual, or an auditory cell. The idea of how the arm *feels* when raised may cause it to rise; but no less may the idea of some *sound* which it makes in rising, or of some *optical* impression which it produces. Thus we see that the 'mental cue' may belong to either of various senses; and that what our diagrams lead us to infer is what really happens; namely, that in our movements, such as that of speech, for example, in some of us it is the tactile, in others the acoustic, *Effectsbild*, or memory-image, which seems most concerned in starting the

articulation (Vol. I. pp. 54-5). The *primitive* 'starters,' however, of all our movements are not *Effectsbilder* at all, but sensations and objects, and subsequently ideas derived therefrom.

Let us now turn to the more complex and serially concatenated movements which oftenest meet us in real life. The object of our will is seldom a single muscular contraction; it is almost always an orderly sequence of contractions, ending with a sensation which tells us that the goal is reached. But the several contractions of the sequence are not each distinctly willed; each earlier one seems rather, by the sensation it produces, to call its follower up, after the fashion described in Chapter VI, where we spoke of habitual concatenated movements being due to a series of secondarily organized reflex arcs (Vol. I. p. 116). The first contraction is the one distinctly willed, and after willing it we let the rest of the chain rattle off of its own accord. How now is such an orderly concatenation of movements originally learned? or in other words, how are paths formed for the first time between one motor centre and another, so that the discharge of the first centre makes the others discharge in due order all along the line?

The phenomenon involves a rapid alternation of motor discharges and resultant afferent impressions, for as long a time as it lasts. They must be associated in one definite order; and the order must once have been *learned*, i.e., it must have been picked out and held to more and more exclusively out of the many other random orders which first presented themselves. The random afferent impressions fell out, those that felt right were selected and grew together in the chain. A chain which we actively teach ourselves by stringing a lot of right-feeling impressions together differs in no essential respect from a chain which we passively learn from someone else who gives us impressions in a certain order. So to make our ideas more precise, let us take a particular concatenated movement for an example, and let it be the recitation of the alphabet, which someone in our childhood taught us to say by heart.

What we have seen so far is how the idea of the sound or articulatory feeling of A may make us say 'A,' that of B, 'B,' and so on. But what we

now want to see is *why the sensation that A is uttered should make us say 'B,' why the sensation that B is uttered should make us say 'C,' and so on.*

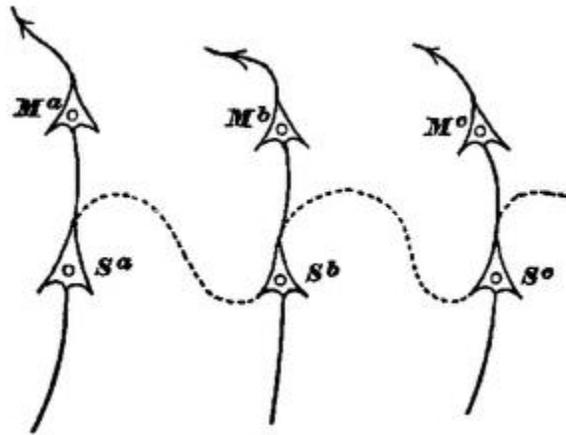


FIG. 89.

To understand this we must recall what happened when we first learned the letters in their order. Someone repeated A, B, C, D to us over and over again, and we imitated the sounds. Sensory cells corresponding to each letter were awakened in succession in such wise that each one of them (by virtue of our second law) must have 'drained' the cell just previously excited and left a path by which that cell tended ever afterwards to discharge into the cell that drained it. Let S^a, S^b, S^c in figure 89 stand for three of these cells. Each later one of them, as it discharges motorwards, draws a current from the previous one, S^b from S^a, and S^c from S^b. Cell S^b having thus drained S^a, if S^a ever gets excited again, it tends to discharge into S^b; whilst S^c having drained S^b, S^b later discharges into S^c, etc., etc.—all through the dotted lines. Let now the idea of the letter A arise in the mind, or, in other words, let S^a be aroused: what happens? A current runs from S^a not only into the motor cell M^a for pronouncing that letter, but also into the cell S^b. When, a moment later, the effect of M^a's discharge comes back by the afferent nerve and re-excites S^a, this latter cell is inhibited from discharging again into M^a and reproducing the 'primordial motor circle' (which in this case would be the continued utterance of the letter A), by the fact that the process in S^b, already under headway and tending to discharge into its own motor associate M^b, is, *under the existing conditions*, the stronger drainage-channel for S^a's excitement. The result is that M^b discharges and the letter B is pronounced; whilst at the same time S^c receives some of S^b's overflow; and, a moment later when the sound of B enters the ear, discharges into the

motor cell for pronouncing C, by a repetition of the same mechanism as before; and so on *ad libitum*. Figure 90 represents the entire set of processes involved.

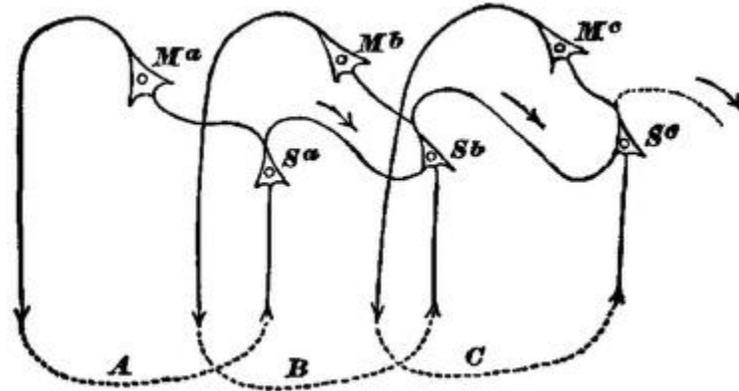


FIG. 90.

The only thing that one does not immediately see is the reason why 'under the existing conditions' the path from S^a to S^b should be the stronger drainage-channel for S^a's excitement. If the cells and fibres in the figure constituted the entire brain we might suppose either a mechanical or a psychical reason. The mechanical reason might lie in a general law that cells like S^b and M^b, whose excitement is in a rising phase, are stronger drainers than cells like M^a, which have just discharged; or it might lie in the fact that an irradiation of the current beyond S^b into S^c and M^c has already begun also; and in a still farther law that drainage tends in the direction of the widest irradiations. Either of these suppositions would be a sufficient mechanical reason why, having once said A, we should not say it again. But we must not forget that the process has a psychical side, nor close our eyes to the possibility that the *sort of feeling* aroused by incipient currents may be the reason why certain of them are instantly inhibited and others helped to flow. There is no doubt that before we have uttered a single letter, the general intention to recite the alphabet is already there; nor is there any doubt that to that intention corresponds a widespread premonitory rising of tensions along the entire system of cells and fibres which are later to be aroused. So long as this rise of tensions *feels good*, so long every current which increases it is furthered, and every current which diminishes it is checked; and this may be the chief one of the 'existing conditions' which make the drainage-channel from S^a to S^b temporarily so strong. ^[511]

The new paths between the sensory cells of which we have studied the formation are paths of 'association,' and we now see why associations run always in the forward direction; why, for example, we cannot say the alphabet backward, and why, although S^b discharges into S^c , there is no tendency for S^c to discharge into S^b , or at least no more than for it to discharge into S^a .^[512] The first-formed paths had, according to the principles which we invoked, to run from cells that had just discharged to those that were discharging; and now, to get currents to run the other way, we must go through a new learning of our letters with their order reversed. There will *then* be two sets of association-pathways, either of them possible, between the sensible cells. I represent them in Fig. 91, leaving out the motor features for simplicity's sake. The dotted lines are the paths in the backward direction, newly organized from the reception by the ear of the letters in the order C B A.

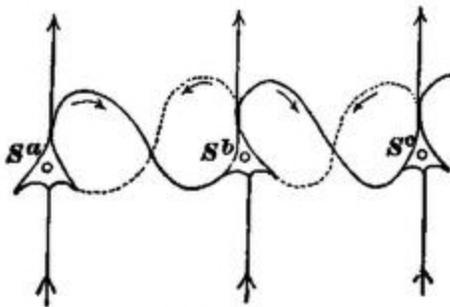


FIG. 91.

The same principles will explain the formation of new paths successively concatenated to no matter how great an extent, but it would obviously be folly to pretend to illustrate by more intricate examples. I will therefore only bring back the case of the child and flame (Vol. I. p. 25), to show how easily it admits of explanation as a 'purely cortical transaction' (*ibid.* p. 80). The sight of the flame stimulates the cortical centre S^1 which discharges by an instinctive reflex path into the centre M^1 for the grasping-movement. This movement produces the feeling of burn, as its effects come back to the centre S^2 ; and this centre by a second connate path discharges into M^2 , the centre for withdrawing the hand. The movement of withdrawal stimulates the centre S^3 , and this, as far as we are concerned, is the last thing that happens. Now the next time the child sees the candle, the cortex is in possession of the secondary paths which the first experience left behind. S^2 ,

having been stimulated immediately after S^1 , drained the latter, and now S^1 discharges into S^2 before the discharge of M^1 has had time to occur; in other words, the sight of the flame suggests the idea of the burn before it produces its own natural reflex effects. The result is an inhibition of M^1 , or an overtaking of it before it is completed, by M^2 .—The characteristic physiological feature in all these acquired systems of paths lies in the fact that the new-formed sensory irradiations keep *draining things forward*, and so breaking up the 'motor circles' which would otherwise accrue. But, even apart from catalepsy, we see the 'motor circle' every now and then come back. An infant learning to execute a simple movement at will, without regard to other movements beyond it, keeps repeating it till tired. How reiteratively they babble each new-learned word! And we adults often catch ourselves reiterating some meaningless word over and over again, if by chance we once begin to utter it 'absent-mindedly,' that is, without thinking of any ulterior train of words to which it may belong.

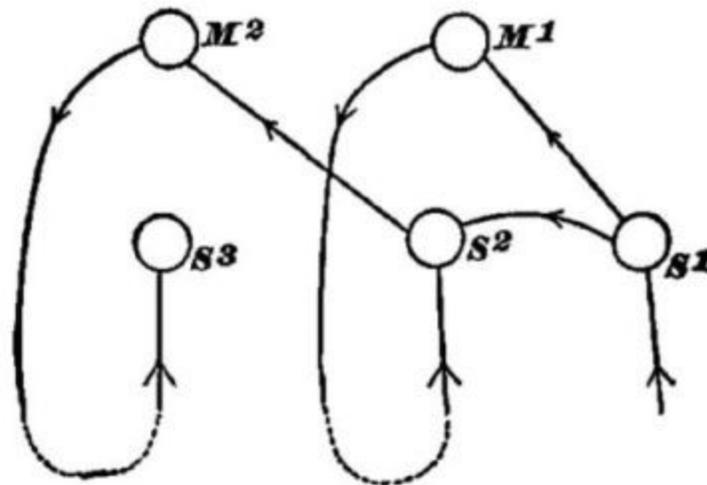


FIG. 92.

One more observation before closing these already too protracted physiological speculations. Already (Vol. I. p. 71) I have tried to shadow forth a reason why collateral innervation should establish itself after loss of brain-tissue, and why incoming stimuli should find their way out again, after an interval, by their former paths. I can now explain this a little better. Let S^1 be the dog's hearing-centre when he receives the command 'Give

your paw.' This *used* to discharge into the motor centre M^1 , of whose discharge S^2 represents the kinæsthetic effect; but now M^1 has been destroyed by an operation, so that S^1 discharges as it can, into other movements of the body, whimpering, raising the wrong paw, etc. The kinæsthetic centre S^2 meanwhile has been awakened by the order S^1 , and the poor animal's mind tingles with expectation and desire of certain incoming sensations which are entirely at variance with those which the really executed movements give. None of the latter sensations arouse a 'motor circle,' for they are displeasing and inhibitory. But when, by random accident, S^1 and S^2 *do* discharge into a path leading through M^2 , by which the *paw is again given*, and S^2 is excited at last from without as well as from within, there are no inhibitions and the 'motor circle' is formed: S^1 discharges into M^2 over and over again, and the path from the one spot to the other is so much deepened that at last it becomes organized as the regular channel of efflux when S^1 is aroused. No other path has a chance of being organized in like degree.

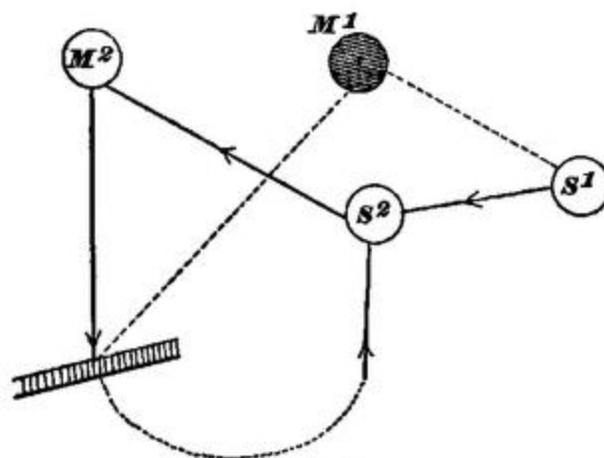


FIG. 93.

[430] Parts of this chapter have appeared in an essay called "The Feeling of Effort," published in the Anniversary Memoirs of the Boston Society of Natural History, 1880; and parts in Scribner's Magazine for Feb. 1888.

[431] I am abstracting at present for simplicity's sake, and so as to keep to the elements of the matter, from the learning of acts by seeing others do them.

[432] Deutsches Archiv f. Klin. Medicin, xxii. 321.

[433] Landry: Mémoire sur la Paralyse du Sens Musculaire, Gazette des Hôpitaux, 1855, p. 270.

[434] Tákacs: Ueber die Verspätung der Empfindungsleitung, Archiv für Psychiatrie, Bd. x. Heft 3, p. 533. Concerning all such cases see the remarks made above on [pp. 205-6](#).

[435] Proceedings of American Soc. for Psychical Research, p. 95.

[436] In reality the movement cannot even be *started* correctly in some cases without the kinæsthetic impression. Thus Dr. Strümpell relates how turning over the boy's hand made him bend the little finger instead of the forefinger, when his eye was closed. "Ordered to point, e.g., towards the left with his left arm, the arm was usually raised straight forward, and then wandered about in groping uncertainty, sometimes getting the right position and then leaving it again. Similarly with the lower limbs. If the patient, lying in bed, had, immediately after the tying of his eyes, to lay the left leg over the right, it often happened that he moved it farther over towards the left, and that it lay over the side of the bed in apparently the most intolerably-uncomfortable position. The turning of the head, too, from right to left, or towards certain objects known to the patient, only ensued correctly when the patient, immediately before his eye was bandaged, specially refreshed his perception as to what the required movement was to be." In another anæsthetic of Dr. Strümpell's (described in the same essay) the arm could not be moved *at all* unless the eyes were opened, however energetic the volition. The variations in these hysteric cases are great. Some patients cannot move the anæsthetic part *at all* when the eyes are closed. Others move it perfectly well, and can even write continuous sentences with the anæsthetic hand. The causes of such differences are as yet incompletely unexplored. M. Binet suggests (Revue Philosophique, xxv. 478) that in those who cannot move the hand at all the sensation of light is required as a 'dynamogenic' agent (see above, [p. 377](#)); and that in those who can move it skilfully the anæsthesia is only a pseudo-insensibility and that the limb is in reality governed by a dissociated or secondary consciousness. This latter explanation is certainly correct. Professor G. E. Müller (Pflüger's Archiv, xlv. 90) invokes the fact of individual differences of imagination to account for the cases who cannot write at all. Their kinæsthetic images properly so called may be weak, he says, and their optical images insufficiently powerful to supplement them without a 'fillip' from sensation. Janet's observation that hysteric anæsthesias may carry amnesias with them would perfectly legitimate Müller's supposition. What we now want is a minute examination of the individual cases. Meanwhile Binet's article above referred to, and Bastian's paper in Brain for April 1887, contain important discussions of the question. In a later note I shall return to the subject again (see [p. 520](#)).

[437] Professor Beaunis found that the accuracy with which a certain tenor sang was not lost when his vocal cords were made anæsthetic by cocain. He concludes that the guiding sensations here are resident in the laryngeal muscles themselves. They are much more probably in the ear. (Beaunis, Les Sensations Internes (1889), p. 253).

[438] As the feeling of heat, for example, is the last psychic antecedent of sweating, as the feeling of bright light is that of the pupil's contraction, as the sight or smell of carrion is that of the movements of disgust, as the remembrance of a blunder may be that of a blush, so the idea of a movement's sensible effects might be that of the movement itself. It is true that the idea of sweating will not commonly make us sweat, nor that of blushing make us blush. But in certain nauseated states the idea of vomiting will make us vomit; and a kind of sequence which is in this case realized only exceptionally might be the rule with the so-called voluntary muscles. It all depends on the nervous connections between the centres of ideation and the discharging paths. These may differ from one sort of centre to another. They do differ somewhat from one individual to another. Many persons never blush at the idea of their blunders, but only when the actual blunder is committed; others blush at the idea; and some do not blush at all. According to Lotze, with some persons "It is possible to weep at will by trying to recall that peculiar feeling in the trigeminal nerve which habitually precedes tears. Some can even succeed in sweating voluntarily, by the lively recollection of the characteristic

skin-sensations, and the voluntary reproduction of an indescribable sort of feeling of relaxation, which ordinarily precedes the flow of perspiration." (Med. Psych., p. 303.) The commoner type of exceptional case is that in which the idea of the *stimulus*, not that of the effects, provokes the effects. Thus we read of persons who contract their pupils at will by strongly imagining a brilliant light. A gentleman once informed me (strangely enough I cannot recall who he was, but I have an impression of his being a medical man) that he could sweat at will by imagining himself on the brink of a precipice. The sweating palms of fear are sometimes producible by imagining a terrible object (cf. Manouvrier in Rev. Phil., xxii. 203). One of my students, whose eyes were made to water by sitting in the dentist's chair before a bright window, can now shed tears by imagining that situation again. One might doubtless collect a large number of idiosyncratic cases of this sort. They teach us how greatly the centres vary in their power to discharge through certain channels. All that we need, now, to account for the differences observed between the psychic antecedents of the voluntary and involuntary movements is that centres producing ideas of the movement's sensible effects should be able to instigate the former, but be out of gear with the latter, unless in exceptional individuals. The famous case of Col. Townsend, who could stop his heart at will, is well known. See, on this whole matter, D. H. Tuke: *Illustrations of the Influence of the Mind on the Body*, chap. xiv. § 3; also J. Braid: *Observations on Trance or Human Hybernation* (1850). The latest reported case of voluntary control of the heart is by Dr. S. A. Pease, in *Boston Medical and Surgical Journal*, May 30, 1889.

[439] Prof. Harless, in an article which in many respects forestalls what I have to say (*Der Apparat des Willens*, in *Fichte's Zeitschrift f. Philos.*, Bd. 38, 1861), uses the convenient word *Effectsbild* to designate these images.

[440] The best modern statement I know is by Jaccoud: *Des Paraplégies et de l'Ataxie du Mouvement* (Paris, 1864), p. 591.

[441] Leidesdorf u. Meynert's *Vierteljsch. f. Psychiatrie*, Bd. i. Heft i. S. 36-7 (1867). *Physiologische Psychologie*, 1st ed. S. 316.

[442] Professor Fouillée, who defends them in the *Revue Philosophique*, xxviii, 561 ff., also admits (p. 574) that they are the same whatever be the movement, and that all our discrimination of *which* movement we are innervating is afferent, consisting of sensations after, and of sensory images before, the act.

[443] Cf. Souriau in *Rev. Philosophique*, xxii. 454.—Professor G. E. Müller thus describes some of his experiments with weights: If, after lifting a weight of 8000 grams a number of times we suddenly get a weight of only 500 grams to lift, "this latter weight is then lifted with a velocity which strikes every onlooker, so that the receptacle for the weight with all its contents often flies high up as if it carried the arm along with it, and the energy with which it is raised is sometimes so entirely out of proportion to the weight itself, that the contents of the receptacle are slung out upon the table in spite of the mechanical obstacles which such a result has to overcome. A more palpable proof that the trouble here is a wrong adaptation of the motor impulse could not be given." *Pflüger's Archiv*, xlv. 47. Compare also p. 57, and the quotation from Hering on the same page.

[444] *Archiv für Psychiatrie*, iii. 618-635. Bernhardt strangely enough seems to think that what his experiments disprove is the existence of afferent muscular feelings, not those of efferent innervation—apparently because he deems that the peculiar thrill of the electricity ought to overpower all other afferent feelings from the part. But it is far more natural to interpret his results the other way, even aside from the certainty yielded by other evidence that passive muscular feelings exist. This other evidence, after being compendiously summed up by Sachs in *Reichert und Du Bois' Archiv* (1874), pp. 174-188, is, as far as the anatomical and physiological grounds go, again thrown into doubt by Mays, *Zeitschrift f. Biologie*, Bd. xx.

[445] *Functions of the Brain*, p. 228.

[446] Vorlesungen über Menschen und Thierseele, i. 222.

[447] In some instances we get an opposite result. Dr. H. Charlton Bastian (British Medical Journal (1869), p. 461, note), says:

"Ask a man whose lower extremities are completely paralyzed, whether, when he ineffectually wills to move either of these limbs, he is conscious of an expenditure of energy in any degree proportionate to that which he would have experienced if his muscles had naturally responded to his volition. He will tell us rather that he has a sense only of his utter powerlessness, and that his volition is a mere mental act, carrying with it no feelings of expended energy such as he is accustomed to experience when his muscles are in powerful action, and from which action and its consequences alone, as I think, he can derive any adequate notion of resistance."

[448] Münsterberg's words may be added: "In lifting an object in the hand I can discover no sensation of volitional energy. I perceive in the first place a slight tension about the head, but that this results from a contraction in the head muscles, and not from a feeling of the brain-discharge, is shown by the simple fact that I get the tension on the right side of the head when I move the right arm, whereas the motor discharge takes place in the opposite side of the brain.... In maximal contractions of body- and limb-muscles there occur, as if it were to reinforce them, those special contractions of the muscles of the face [especially frowning and clinching teeth] and those tensions of the skin of the head. These sympathetic movements, felt particularly on the side which makes the effort, are perhaps the immediate ground why we ascribe our awareness of maximal contraction to the region of the head, and call it a consciousness of force, instead of a peripheral sensation." (Die Willenshandlung (1888), pp. 73, 82.) Herr Münsterberg's work is a little masterpiece, which appeared after my text was written. I shall have repeatedly to refer to it again, and cordially recommend to the reader its most thorough refutation of the Innervationsgefühl-theory.

[449] Physiologische Optik, p. 600.

[450] [The left and sound eye is here supposed covered. If both eyes look at the same field there are double images which still more perplex the judgment. The patient, however, learns to see correctly before many days or weeks are over.—W. J.]

[451] Alfred Graefe, in Handbuch der gesammten Augenheilkunde, Bd. vi. pp. 18-21.

[452] Professor G. E. Müller (Zur Grundlegung der Psychophysik (1878), p. 318,) was the first to explain the phenomenon after the manner advocated in the text. Still unacquainted with his book, I published my own similar explanation two years later.

Professor Mach in his wonderfully original little work 'Beiträge zur Analyse der Empfindungen,' p. 57, describes an artificial way of getting translocation, and explains the effect likewise by the feeling of innervation. "Turn your eyes," he says, "as far as possible towards the left and press against the right sides of the orbits two large lumps of putty. If you then try to look as quickly as possible towards the right, this succeeds, on account of the incompletely spherical form of the eyes, only imperfectly, and the objects consequently appear translocated very considerably towards the right. The *bare will* to look rightwards gives to all images on the retina a greater *rightwards value*, to express it shortly. The experiment is at first surprising."—I regret to say that I cannot myself make it succeed—I know not for what reason. But even where it does succeed it seems to me that the conditions are much too complicated for Professor Mach's theoretic conclusions to be safely drawn. The putty squeezed into the orbit, and the pressure of the eyeball against it must give rise to peripheral sensations *strong* enough, at any rate (if only of the right kind), to justify any amount of false perception of our eyeball's position, quite apart from the innervation feelings which Professor Mach supposes to coexist.

[453] An illusion in principle exactly analogous to that of the patient under discussion can be produced experimentally in anyone in a way which Hering has described in his *Lehre von Binocularen Sehen*, pp. 13-14. I will quote Helmholtz's account of it, which is especially valuable as coming from a believer in the *Innervationsgefühl*: "Let the two eyes first look parallel, then let the right eye be closed whilst the left still looks at the infinitely distant object *a*. The directions of both eyes will thus remain unaltered, and *a* will be seen in its right place. Now accommodate the left eye for a point *f* [a needle in Hering's experiment] lying on the optical axis between it and *a*, only very near. The position of the left eye and its optical axis, as well as the place of the retinal image upon it... are wholly unaltered by this movement. But the consequence is that an apparent movement of the object occurs—a movement towards the left. As soon as we accommodate again for distance the object returns to its old place. Now what alters itself in this experiment is only the position of the closed right eye: its optical axis, when the effort is made to accommodate for the point *f*, also converges towards this point.... Conversely it is possible for me to make my optical axes diverge, even with closed eyes, so that in the above experiment the right eye should turn far to the right of *a*. This divergence is but slowly reached, and gives me therefore no illusory movement. But when I suddenly relax my effort to make it, and the right optical axis springs back to the parallel position, I immediately see the object which the left eye fixates shift its position towards the left. Thus not only the position of the seeing eye *a*, but also that of the closed eye *b*, influences our judgment of the direction in which the seen object lies. The open eye remaining fixed, and the closed eye moving towards the right or left, the object seen by the open eye appears also to move towards the right or left" (*Physiol. Optik*, pp. 607-8.)

[454] *Beiträge zur Analyse der Empfindungen*, p. 65.

[455] P. 68.

[456] I owe the interpretation in the text to my friend and former student, Mr. E. S. Drown, whom I set to observe the phenomenon before I had observed it myself. Concerning the vacillations in our interpretation of relative motion over retina and skin, see above, [p. 173](#).

Herr Münsterberg gives additional reasons against the feeling of innervation, of which I will quote a couple. First, our ideas of movement are all *faint* ideas, resembling in this the copies of sensations in memory. Were they feelings of the outgoing discharge, they would be original states of consciousness, not copies; and ought by analogy to be *vivid* like other original states.—Second, our unstriped muscles yield no feelings in contracting, nor can they be contracted at will, differing thus in *two* peculiarities from the voluntary muscles. What more natural than to suppose that the two peculiarities hang together, and that the reason why we cannot contract our intestines, for example, at will, is, that we have no memory-images of how their contraction feels? Were the supposed innervation-feeling always the 'mental cue,' one doesn't see why we might not have it even where, as here, the contractions themselves are unfelt, and why it might not bring the contractions about. (*Die Willenshandlung*, pp 87-8.)

[457] *Revue Philosophique*, xxiii. 442.

[458] *Ibid.* xx. 604.

[459] Herr Sternberg (*Pflüger's Archiv*, xxxvii. p. 1) thinks that he proves the feeling of innervation by the fact that when we have willed to make a movement we generally think that it is made. We have already seen some of the facts on [pp. 105-6](#), above. S. cites from Exner the fact that if we put a piece of hard rubber between our back teeth and bite, our front teeth seem actually to approach each other, although it is physically impossible for them to do so. He proposes the following experiment: Lay the palm of the hand on a table with the forefinger overlapping its edge and flexed back as far as possible, whilst the table keeps the other fingers extended; then try to flex the terminal joint of the forefinger without looking. You do not do it, and yet you think that you do. Here again the

innervation, according to the author, is felt as an executed movement. It seems to me, as I said in the previous place, that the illusion is in all these cases due to the inveterate association of ideas. Normally our will to move has always been followed by the sensation that we *have* moved, except when the simultaneous sensation of an external resistance was there. The result is that where we feel no external resistance, and the muscles and tendons tighten, the invariably associated idea is intense enough to be hallucinatory. In the experiment with the teeth, the resistance customarily met with when our masseters contract is a soft one. We do not close our teeth on a thing like hard rubber once in a million times; so when we do so, we imagine the habitual result.—Persons with *amputated limbs* more often than not continue to feel them as if they were still there, and can, moreover, give themselves the feeling of moving them at will. The life-long sensorial associate of the idea of 'working one's toes,' e.g. (uncorrected by any opposite sensation, since no real sensation of non-movement can come from non-existing toes), follows the idea and swallows it up. The man thinks that his toes are 'working' (cf. Proceedings of American Soc. for Psych. Research, p. 249).

Herr Loeb also comes to the rescue of the feeling of innervation with observations of his own made after my text was written, but they convince me no more than the arguments of others. Loeb's facts are these (Pflüger's Archiv, xlv. p. 1): If we stand before a vertical surface, and if, with our hands *at different heights*, we *simultaneously* make with them what seem to us equally extensive movements, that movement always turns out really shorter which is made with the arm whose muscles (in virtue of the arm's position) are already the more contracted. The same result ensues when the arms are laterally unsymmetrical. Loeb assumes that both arms contract by virtue of a common innervation, but that although this innervation is relatively less effective upon the more contracted arm, our *feeling* of its equal strength overpowers the disparity of the incoming sensations of movement which the two limbs send back, and makes us think that the spaces they traverse are the same. "The sensation of the extent and direction of our voluntary movements depends accordingly upon the impulse of our will to move, and not upon the feelings set up by the motion in the active organ." Now if this is the elementary law which Loeb calls it, why does it only manifest its effect when both hands are moving simultaneously? Why not when the *same* hand makes *successive* movements? and especially why not when both hands move symmetrically or at the same level, but *one of them* is *weighted*? A weighted hand surely requires a stronger innervation than an unweighted one to move an equal distance upwards; and yet, as Loeb confesses, we do not tend to overestimate the path which it traverses under these circumstances. The fact is that the illusion which Loeb has studied is a complex resultant of many factors. One of them, it seems to me, is an instinctive tendency to *revert to the type of the bilateral movements of childhood*. In adult life we move our arms for the most part in alternation; but in infancy the free movements of the arms are almost always similar on both sides, symmetrical when the direction of motion is horizontal, and with the hands on the same level when it is vertical. The most natural innervation, when the movements are rapidly performed, is one which takes the movement back to this form. Our *estimation* meanwhile of the lengths severally traversed by the two hands is mainly based, as such estimations with closed eyes usually are (see Loeb's own earlier paper, *Untersuchungen über den Fühlraum der Hand*, in Pflüger's Archiv, xli. 107), upon the apparent velocity and duration of the movement. The duration is the same for both hands, since the movements begin and end simultaneously. The velocities of the two hands are under the experimental conditions almost impossible of comparison. It is well known how imperfect a discrimination of *weights* we have when we 'heft' them simultaneously, one in either hand; and G. E. Müller has well shown (Pflüger's Archiv, xlv. 57) that the velocity of the lift is the main factor in determining our judgment of weight. It is hardly possible to conceive of more unfavorable conditions for making an accurate comparison of the length of two movements than those which govern the experiments which are under discussion. The only prominent sign is the duration, which would lead us to infer the equality of the two movements. We consequently deem them equal, though a native tendency in our motor centres keeps them from being so.

[460] This is by no means an unpalatable opinion. See Vol. I. p. 65.

[461] Maine de Biran, Royer Collard, Sir John Herschel, Dr. Carpenter, Dr. Martineau, all seem to posit a force-sense by which, in becoming aware of an outer resistance to our will, we are taught the existence of an outer world. I hold that every peripheral sensation gives us an outer world. An insect crawling on our skin gives us as 'outward' an impression as a hundred pounds weighing on our back.—I have read M. A. Bertrand's criticism of my views (*La Psychologie de l'Effort*, 1889); but as he seems to think that I deny the *feeling* of effort altogether, I can get no profit from it, despite his charming way of saying things.

[462] Bowditch and Southard in *Journal of Physiology*, vol. iii. No. 3. It was found in these experiments that the maximum of accuracy was reached when two seconds of time elapsed between locating the object by eye or hand and starting to touch it. When the mark was located with one hand, and the other hand had to touch it, the error was considerably greater than when the same hand both located and touched it.

[463] The same caution must be shown in discussing pathological cases. There are remarkable discrepancies in the effects of peripheral anæsthesia upon the voluntary power. Such cases as I quoted in the text (p. 490) are by no means the only type. In those cases the patients could move their limbs accurately when the eyes were open, and inaccurately when they were shut. In other cases, however, the anæsthetic patients *cannot move their limbs at all* when the eyes are shut. (For reports of two such cases see Bastian in 'Brain,' Binet in *Rev. Philos.*, xxv. 478.) M. Binet explains these (hysterical) cases as requiring the 'dynamogenic' stimulus of light (see above, p. 377). They *might*, however, be cases of such congenitally defective optical imagination that the 'mental cue' was normally 'tactile;' and that when this tactile cue failed through functional inertness of the kinæsthetic centres, the only optical cue strong enough to determine the discharge had to be an actual *sensation* of the eye.—There is still a third class of cases in which the limbs have lost all sensibility, even for movements passively imprinted, but in which voluntary movements can be accurately executed even when the eyes are closed. MM. Binet and Féré have reported some of these interesting cases, which are found amongst the hysterical hemianæsthetics. They can, for example, write accurately at will, although their eyes are closed and they have no feeling of the writing taking place, and many of them do not know when it begins or stops. Asked to write repeatedly the letter *a*, and then say how many times they have written it, some are able to assign the number and some are not. Some of them admit that they are guided by visual imagination of what is being done. Cf. *Archives de Physiologie*, Oct. 1887, pp. 363-5. Now it would seem at first sight that feelings of outgoing innervation must exist in these cases and be kept account of. There are no other guiding impressions, either immediate or remote, of which the patient is conscious; and unless feelings of innervation be there, the writing would seem miraculous. But if such feelings are present in these cases, and suffice to direct accurately the succession of movements, why do they not suffice in those other anæsthetic cases in which movement becomes disorderly when the eyes are closed? *Innervation* is there, or there would be no movement; why is the *feeling* of the innervation gone? The truth seems to be, as M. Binet supposes (*Rev. Philos.*, xxiii. p. 479), that these cases are not arguments for the feeling of innervation. They are pathological curiosities; and the patients are not really anæsthetic, but are victims of that curious dissociation or splitting-off of one part of their consciousness from the rest which we are just beginning to understand, thanks to Messrs. Janet, Binet, and Gurney, and in which the split-off part (in this case the kinæsthetic sensations) may nevertheless remain to produce its usual effects. Compare what was said above, p. 491.

[464] *Medicinische Psychologie*, p. 293. In his admirably acute chapter on the Will this author has most explicitly maintained the position that what we call muscular exertion is an afferent and not an efferent feeling; "We must affirm universally that in the muscular feeling we are not sensible of *the force* on its way to produce an effect, but only of the *sufferance* already produced in our movable

organs, the muscles, after the force has, in a manner unobservable by us, exerted upon them its causality" (p. 311). How often the battles of psychology have to be fought over again, each time with heavier armies and bigger trains, though not always with such able generals!

[465] Ch. Féré: *Sensation et Mouvement* (1887), chapter iii.

[466] Professor A. Bain (*Senses and Intellect*, pp 336-48) and Dr. W. B. Carpenter (*Mental Physiology*, chap. vi) give examples in abundance.

[467] For a full account, by an expert, of the 'willing-game,' see Mr. Stuart Cumberland's article: *A Thought-reader's Experiences in the Nineteenth century*, xx. 867. M. Gley has given a good example of ideo-motor action in the *Bulletins de la Société de Psychologie Physiologique* for 1889. Tell a person to think intently of a certain name, and saying that you will then force her to write it, let her hold a pencil, and do you yourself hold her hand. She will then probably trace the name involuntarily, believing that you are forcing her to do it.

[468] I abstract here from the fact that a certain *intensity* of the consciousness is required for its impulsiveness to be effective in a complete degree. There is an inertia in the motor processes as in all other natural things. In certain individuals, and at certain times (disease, fatigue), the inertia is unusually great, and we may then have ideas of action which produce no visible act, but discharge themselves into merely nascent dispositions to activity or into emotional expression. The inertia of the motor parts here plays the same rôle as is elsewhere played by antagonistic ideas. We shall consider this restrictive inertia later on, it obviously introduces no essential alteration into the law which the text lays down.

[469] I use the common phraseology here for mere convenience' sake. The reader who has made himself acquainted with Chapter IX will always understand, when he hears of many ideas simultaneously present to the mind and acting upon each other, that what is really meant is a mind with one idea before it, of many objects, purposes, reasons, motives, related to each other, some in a harmonious and some in an antagonistic way. With this caution I shall not hesitate from time to time to fall into the popular Lockian speech, erroneous though I believe it to be.

[470] My attention was first emphatically called to this class of decisions by my colleague, Professor C. C. Everett.

[471] In an excellent article on *The 'Mental Qualities of an Athlete'* in the *Harvard Monthly*, vol. vi. p. 43, Mr. A. T. Dudley assigns the first place to the rapidly impulsive temperament. "Ask him how, in some complex trick, he performed a certain act, why he pushed or pulled at a certain instant, and he will tell you he does not know; he did it by instinct; or rather his nerves and muscles did it of themselves.... Here is the distinguishing feature of the good player: the good player, confident in his training and his practice, in the critical game trusts entirely to his impulse, and does not think out every move. The poor player, unable to trust his impulsive actions, is compelled to think carefully all the time. He thus not only loses the opportunities through his slowness in comprehending the whole situation, but, being compelled to think rapidly all the time, at critical points becomes confused; while the first-rate player, not trying to reason, but acting as impulse directs, is continually distinguishing himself and plays the better under the greater pressure."

[472] T. B. Clouston, *Clinical Lectures on Mental Diseases* (London 1883), pp. 310-318.

[473] In his *Maladies de la Volonté*, p. 77.

[474] For other cases of 'impulsive insanity,' see H. Maudsley's *Responsibility in Mental Disease*, pp. 133-170, and Forbes Winslow's *Obscure Diseases of the Mind and Brain*, chapters vi, vii, viii.

[475] Quoted by G. Burr, in an article on the *Insanity of Inebriety* in the *N. Y. Psychological and Medico-Legal Journal*, Dec. 1874.

[476] Autobiography, Howells' edition (1877), pp. 192-6.

[477] See a paper on Insistent and Fixed Ideas by Dr. Cowles in *American Journal of Psychology*, i. 222; and another on the so-called Insanity of Doubt by Dr. Knapp, *ibid.* iii. 1. The latter contains a partial bibliography of the subject.

[478] Quoted by Ribot, *op cit.* p. 39.

[479] The silliness of the old-fashioned pleasure-philosophy *saute aux yeux*. Take, for example, Prof. Bain's explanation of sociability and parental love by the pleasures of touch: "Touch is the fundamental and generic sense.... Even after the remaining senses are differentiated, the primary sense continues to be a leading susceptibility of the mind. The soft warm touch, if not a first-class influence, is at least an approach to that. The combined power of soft contact and warmth amounts to a considerable pitch of massive pleasure; while there may be subtle influences not reducible to these two heads, such as we term, from not knowing anything about them, magnetic or electric. The sort of thrill from taking a baby in arms is something beyond mere warm touch; and it may rise to the ecstatic height, in which case, however, there may be concurrent sensations and ideas.... In mere tender emotion not sexual, there is nothing but the sense of touch to gratify, unless we assume the occult magnetic influences.... In a word, our love pleasures begin and end in sensual contact. Touch is both the alpha and omega of affection. As the terminal and satisfying sensation, the *ne plus ultra*, it must be a pleasure of the highest degree.... Why should a more lively feeling grow up towards a fellow-being than towards a perennial fountain? [This 'should' is simply delicious from the more modern evolutionary point of view.] It must be that there is a source of pleasure in the companionship of other sentient creatures, over and above the help afforded by them in obtaining the necessaries of life. To account for this, I can suggest nothing but the primary and independent pleasure of the animal embrace." [Mind, this is said not of the sexual interest, but of 'Sociability at Large.'] "For this pleasure every creature is disposed to pay something, even when it is only fraternal. A certain amount of material benefit imparted is a condition of the full heartiness of a responding embrace, the complete fruition of this primitive joy. In the absence of those conditions the pleasure of giving ... can scarcely be accounted for; we know full well that, without these helps, it would be a very meagre sentiment in beings like ourselves.... It seems to me that there must be at the [parental instinct's] foundation that intense pleasure in the embrace of the young which we find to characterize the parental feeling throughout. Such a pleasure once created would associate itself with the prevailing features and aspects of the young, and give to all of these their very great interest. For the sake of the pleasure, the parent discovers the necessity of nourishing the subject of it, and comes to regard the ministering function as a part or condition of the delight" (*Emotions and Will*, pp. 126, 127, 132, 133, 140). Prof. Bain does not explain why a satin cushion kept at about 98° F. would not on the whole give us the pleasure in question more cheaply than our friends and babies do. It is true that the cushion might lack the 'occult magnetic influences.' Most of us would say that neither a baby's nor a friend's skin would possess them, were not a tenderness already there. The youth who feels ecstasy shoot through him when by accident the silken palm or even the 'vesture's hem' of his idol touches him, would hardly feel it were he not hard hit by Cupid in advance. The love creates the ecstasy, not the ecstasy the love. And for the rest of us can it possibly be that all our social virtue springs from an appetite for the sensual pleasure of having our hand shaken, or being slapped on the back?

[480] *Emotion and Will*, p. 352. But even Bain's own description belies his formula, for the idea appears as the 'moving' and the pleasure as the 'directing' force.

[481] P. 398.

[482] P. 354.

[483] P. 355.

[484] P. 390.

[485] Pp. 295-6.

[486] P. 121.

[487] Cf. also Bain's note to Jas. Mill's Analysis, vol. ii. p. 305.

[488] How much clearer Hume's head was than that of his disciples! "It has been proved beyond all controversy that even the passions commonly esteemed selfish carry the Mind beyond self directly to the object; that though the satisfaction of these passions gives us enjoyment, yet the prospect of this enjoyment is not the cause of the passions but, on the contrary, the passion is antecedent to the enjoyment, and without the former the latter could never possibly exist," etc. (Essay on the Different Species of Philosophy, § 1, note near the end.)

[489] In favor of the view in the text, one may consult H. Sidgwick, Methods of Ethics, book i. chap. iv; T. H. Green, Prolegomena to Ethics, bk. iii. chap. i. p. 179; Carpenter, Mental Physiol., chap vi; J. Martineau, Types of Ethical Theory, part ii, bk. i, chap. ii. i, and bk. ii, branch i. chap. i. i. § 3. Against it see Leslie Stephen, Science of Ethics, chap. ii. § ii; H. Spencer, Data of Ethics, §§ 9-15; D. G. Thompson, System of Psychology, part ix, and Mind, vi. 62. Also Bain, Senses and Intellect, 738-44; Emotions and Will, 436.

[490] This sentence is written from the author's own consciousness. But many persons say that where they disbelieve in the effects ensuing, as in the case of the table, they cannot will it. They "cannot exert a volition that a table should move." This personal difference may be partly verbal. Different people may attach different connotations to the word 'will.' But I incline to think that we differ psychologically as well. When one knows that he has no power, one's desire of a thing is called a *wish* and not a will. The sense of impotence inhibits the volition. Only by abstracting from the thought of the impossibility am I able to imagine strongly the table sliding over the floor, to make the bodily 'effort' which I do, and to will it to come towards me. It may be that some people are unable to perform this abstraction, and that the image of the table stationary on the floor inhibits the contradictory image of its moving, which is the object to be willed.

[491] A normal palsy occurs during sleep. We will all sorts of motions in our dreams, but seldom perform any of them. In nightmare we become conscious of the non-performance, and make a muscular 'effort.' This seems then to occur in a restricted way, limiting itself to the occlusion of the glottis and producing the respiratory anxiety which wakes us up.

[492] Both resolves and beliefs have of course immediate motor consequences of a quasi-emotional sort, changes of breathing, of attitude, internal speech movements, etc.; but these movements are not the *objects* resolved on or believed. The movements in common volition are the objects willed.

[493] This *volitional* effort pure and simple must be carefully distinguished from the *muscular* effort with which it is usually confounded. The latter consists of all those peripheral feelings to which a muscular 'exertion' may give rise. These feelings, whenever they are massive and the body is not 'fresh,' are rather disagreeable, especially when accompanied by stopped breath, congested head, bruised skin of fingers, toes, or shoulders, and strained joints. And it is only *as thus disagreeable* that the mind must make its *volitional* effort in stably representing their reality and consequently bringing it about. That they happen to be made real by muscular activity is a purely accidental circumstance. A soldier standing still to be fired at expects disagreeable sensations from his muscular passivity. The action of his will, in sustaining the expectation, is identical with that required for a painful muscular effort. What is hard for both *is facing an idea as real*.

Where much muscular effort is not needed or where the 'freshness' is very great, the volitional effort is not required to sustain the idea of movement, which comes then and stays in virtue of association's simpler laws. More commonly, however, muscular effort involves volitional effort as well. Exhausted with fatigue and wet and watching, the sailor on a wreck throws himself down to rest. But hardly are

his limbs fairly relaxed, when the order 'To the pumps!' again sounds in his ears. Shall he, can he, obey it? Is it not better just to let his aching body lie, and let the ship go down if she will? So he lies on, till, with a desperate heave of the will, at last he staggers to his legs, and to his task again. Again, there are instances where the fiat demands great volitional effort though the muscular exertion be insignificant, e.g., the getting out of bed and bathing one's self on a cold morning.

[494] Cf. Aristotle's *Nicomachæan Ethics*, vii. 3; also a discussion of the doctrine of 'The Practical Syllogism' in Sir A. Grant's edition of this work, 2d ed. vol. i. p. 212 ff.

[495] *The Duality of the Mind*, pp. 141-2. Another case from the same book (p. 123): "A gentleman of respectable birth, excellent education, and ample fortune, engaged in one of the highest departments of trade,... and being induced to embark in one of the plausible speculations of the day ... was utterly ruined. Like other men he could bear a sudden overwhelming reverse better than a long succession of petty misfortunes, and the way in which he conducted himself on the occasion met with unbounded admiration from his friends. He withdrew, however, into rigid seclusion, and being no longer able to exercise the generosity and indulge the benevolent feelings which had formed the happiness of his life, made himself a substitute for them by daydreams, gradually fell into a state of irritable despondency, from which he only gradually recovered with the loss of reason. He now fancied himself possessed of immense wealth, and gave without stint his imaginary riches. He has ever since been under gentle restraint, and leads a life not merely of happiness, but of bliss; converses rationally, reads the newspapers, where every tale of distress attracts his notice, and being furnished with an abundant supply of blank checks, he fills up one of them with a munificent sum, sends it off to the sufferer, and sits down to his dinner with a happy conviction that he has earned the right to a little indulgence in the pleasures of the table; and yet, on a serious conversation with one of his old friends, he is quite conscious of his real position, but the conviction is so exquisitely painful that *he will not let himself believe it.*"

[496] 'Le Sentiment de l'Effort, et la Conscience de l'Action,' in *Revue Philosophique*, xxviii. 561.

[497] P. 577.

[498] They will be found indicated, in somewhat popular form, in a lecture on 'The Dilemma of Determinism,' published in the *Unitarian Review* (of Boston) for September 1884 (vol. xxii. p. 193).

[499] See *Grundtatsachen des Seelenlebens*, pp. 594-5; and compare the conclusion of our own chapter on Attention, Vol. I. pp. 448-454.

[500] Thus at least I interpret Prof. Lipps's words: "Wir wissen uns naturgemäss in jedem Streben umsomehr aktiv, je mehr unser *ganzes* Ich bei dem Streben beheiligt ist," u. s. w. (p. 601).

[501] Such ejaculations as Mr. Spencer's: "Psychical changes either conform to law or they do not. If they do not, this work, in common with all works on the subject, is sheer nonsense: no science of Psychology is possible" (*Principles of Psychology*, i. 503),—are beneath criticism. Mr. Spencer's work, like all the other 'works on the subject,' treats of those general conditions of *possible* conduct within which all our real decisions must fall no matter whether their effort be small or great. However closely psychical changes may conform to law, it is safe to say that individual histories and biographies will never be written in advance no matter how 'evolved' psychology may become.

[502] *Caricatures* of the kind of supposition which free will demands abound in deterministic literature. The following passage from John Fiske's *Cosmic Philosophy* (pt. ii. chap. xvii) is an example: "If volitions arise without cause, it necessarily follows that we cannot infer from them the character of the antecedent states of feeling. If, therefore, a murder has been committed, we have *a priori* no better reason for suspecting the worst enemy than the best friend of the murdered man. If we see a man jump from a fourth-story window, we must beware of too hastily inferring his insanity, since he may be merely exercising his free-will; the intense love of life implanted in the human

breast being, as it seems, unconnected with attempts at suicide or at self-preservation. We can thus frame no theory of human actions whatever. The countless empirical maxims of every-day life, the embodiment as they are of the inherited and organized sagacity of many generations, become wholly incompetent to guide us; and nothing which any one may do ought ever to occasion surprise. The mother may strangle her first-born child, the miser may cast his long-treasured gold into the sea, the sculptor may break in pieces his lately-finished statue, in the presence of no other feelings than those which before led them to cherish, to hoard, and to create.

"To state these conclusions is to refute their premise. Probably no defender of the doctrine of free-will could be induced to accept them, even to save the theorem with which they are inseparably wrapped up. Yet the dilemma cannot be avoided. Volitions are either caused or they are not. If they are not caused, an inexorable logic brings us to the absurdities just mentioned. If they are caused, the free-will doctrine is annihilated.... In truth, the immediate corollaries of the free-will doctrine are so shocking, not only to philosophy but to common-sense, that were not accurate thinking a somewhat rare phenomenon, it would be inexplicable how any credit should ever have been given to such a dogma. This is but one of the many instances in which by the force of words alone men have been held subject to chronic delusion.... Attempting, as the free-will philosophers do, to destroy the science of history, they are compelled by an inexorable logic to pull down with it the cardinal principles of ethics, politics, and jurisprudence. Political economy, if rigidly dealt with on their theory, would fare little better; and psychology would become chaotic jargon.... The denial of causation is the affirmation of chance, and 'between the theory of Chance and the theory of Law there can be no compromise, no reciprocity, no borrowing and lending.' To write history on any method furnished by the free-will doctrine would be utterly impossible."—All this comes from Mr. Fiske's not distinguishing between the possibles which really tempts man and those which tempt him not at all. Free-will, like psychology, deals with the former possibles exclusively.

[503] On the education of the Will from a pedagogic point of view, see an article by G. Stanley Hall in the *Princeton Review* for November 1882, and some bibliographic references there contained.

[504] See his *Emotions and Will*, 'The Will,' chap. i. I take the name of random movements from Sully, *Outlines of Psychology*, p. 593.

[505] This figure and the following ones are purely schematic, and must not be supposed to involve any theory about protoplasmatic and axis-cylinder processes. The latter, according to Golgi and others, emerge from the base of the cell, and each cell has but one. They alone form a nervous network. The reader will of course also understand that none of the hypothetical constructions which I make from now to the end of the chapter are proposed as definite accounts of what happens. All I aim at is to make it clear in some more or less symbolic fashion that the formation of new paths, the learning of habits, etc., is in *some* mechanical way conceivable. Compare what was said in Vol. I. p. 81, note.

[506] *The Nervous System and the Mind* (1888), pp. 75-6.

[507] Compare Vol. I. pp. 137, 142.

[508] That is, the direction towards the motor cells.

[509] This brain-scheme seems oddly enough to give a certain basis of reality to those hideously fabulous performances of the Herbartian *Vorstellungen*. Herbart says that when one idea is inhibited by another it fuses with that other and thereafter helps it to ascend into consciousness. Inhibition is thus the basis of association in both schemes, for the 'draining' of which the text speaks is tantamount to an inhibition of the activity of the cells which are drained, which inhibition makes the inhibited revive the inhibitor on later occasions.

[510] See the luminous passage in Münsterberg: *Die Willenshandlung*, pp. 144-5.

[511] L. Lange's and Münsterberg's experiments with 'shortened' or 'muscular' reaction-time (see Vol. I. p. 432) show how potent a fact dynamically this anticipatory preparation of a whole set of possible drainage-channels is.

[512] Even as the proofs of these pages are passing through my hands, I receive Heft 2 of the *Zeitschrift für Psychologie u. Physiologie der Sinnesorgane*, in which the irrepressible young Münsterberg publishes experiments to show that there is no association between successive ideas, apart from intervening movements. As my explanations have assumed that an earlier excited *sensory* cell drains a later one, his experiments and inferences would, if sound, upset all my hypotheses. I therefore can (at this late moment) only refer the reader to Herr M.'s article, hoping to review the subject again myself in another place.

CHAPTER XXVII.

HYPNOTISM.

MODES OF OPERATING, AND SUSCEPTIBILITY.

The 'hypnotic,' 'mesmeric,' or 'magnetic' trance *can be induced in various ways*, each operator having his pet method. The simplest one is to leave the subject seated by himself, telling him that if he close his eyes and relax his muscles and, as far as possible, think of vacancy, in a few minutes he will 'go off.' On returning in ten minutes you may find him effectually hypnotized. Braid used to make his subjects look at a bright button held near their forehead until their eyes spontaneously closed. The older mesmerists made 'passes' in a downward direction over the face and body, but without contact. Stroking the skin of the head, face, arms and hands, especially that of the region round the brows and eyes, will have the same effect. Staring into the eyes of the subject until the latter droop, making him listen to a watch's ticking; or simply making him close his eyes for a minute whilst you describe to him the feeling of falling into sleep, 'talk sleep' to him, are equally efficacious methods in the hands of some operators; whilst with trained subjects any method whatever from which they have been led by previous suggestion to expect results will be successful.^[513] The touching of an object which they are told has been 'magnetized,' the drinking of 'magnetized' water, the reception of a letter ordering them to sleep, etc., are means which have been frequently employed. Recently M.

Liégeois has hypnotized some of his subjects at a distance of 1 1/2 kilometres by giving them an intimation to that effect through a telephone. With some subjects, if you tell them in advance that at a certain hour of a certain day they will become entranced, the prophecy is fulfilled. Certain hysterical patients are immediately thrown into hypnotic catalepsy by any violent sensation, such as a blow on a gong or the flashing of an intense light in their eyes. Pressure on certain parts of the body (called *zones hypnogènes* by M. Pitres) rapidly produces hypnotic sleep in some hysterics. These regions, which differ in different subjects, are oftenest found on the forehead and about the root of the thumbs. Finally, persons in ordinary sleep may be transferred into the hypnotic condition by verbal intimation or contact, performed so gently as not to wake them up.

Some operators appear to be more successful than others in getting control of their subjects. I am informed that Mr. Gurney (who made valuable contributions to the theory of hypnotism) was never able himself to hypnotize, and had to use for his observations the subjects of others. On the other hand, Dr. Liébeault claims that he hypnotizes 92% of all comers, and Wetterstrand in Stockholm says that amongst 718 persons there proved to be only 18 whom he failed to influence. Some of this disparity is unquestionably due to differences in the personal 'authority' of the operator, for the prime condition of success is that the subject should confidently *expect* to be entranced. Much also depends on the operator's tact in interpreting the physiognomy of his subjects, so as to give the right commands, and 'crowd it on' to the subject, at just the propitious moments. These conditions account for the fact that operators grow more successful the more they operate. Bernheim says that whoever does not hypnotize 80 per cent of the persons whom he tries has not yet learned to operate as he should. Whether certain operators have over and above this a peculiar 'magnetic power' is a question which I leave at present undecided.^[514] Children under three or four, and insane persons, especially idiots, are unusually hard to hypnotize. This seems due to the impossibility of getting them to fix their attention continuously on the idea of the coming trance. All ages above infancy are probably equally hypnotizable, as are all races

and both sexes. A certain amount of mental training, sufficient to aid concentration of the attention, seems a favorable condition, and so does a certain momentary indifference or passivity as to the result. Native strength or weakness of 'will' have absolutely nothing to do with the matter. Frequent trances enormously increase the susceptibility of a subject, and many who resist at first succumb after several trials. Dr. Moll says he has more than once succeeded after forty fruitless attempts. Some experts are of the opinion that every one is hypnotizable essentially, the only difficulty being the more habitual presence in some individuals of hindering mental preoccupations, which, however, may suddenly at some moment be removed.

The trance may be dispelled instantaneously by saying in a rousing voice, 'All right, wake up!' or words of similar purport. At the Salpêtrière they awaken subjects by blowing on their eyelids. Upward passes have an awakening effect; sprinkling cold water ditto. Anything will awaken a patient who expects to be awakened by that thing. Tell him that he will wake after counting five, and he will do so. Tell him to waken in five minutes, and he is very likely to do so punctually, even though he interrupt thereby some exciting histrionic performance which you may have suggested.—As Dr. Moll says, any theory which pretends to explain the physiology of the hypnotic state must keep account of the fact that so simple a thing as hearing the word 'wake!' will end it.

THEORIES ABOUT THE HYPNOTIC STATE.

The intimate nature of the hypnotic condition, when once induced, can hardly be said to be understood. Without entering into details of controversy, one may say that three main opinions have been held concerning it, which we may call respectively the theories of

1. Animal magnetism;
2. of Neurosis; and finally of
3. Suggestion.

According to the *animal-magnetism theory* there is a direct passage of force from the operator to the subject, whereby the latter becomes the former's puppet. This theory is nowadays given up as regards all the ordinary hypnotic phenomena, and is only held to by some persons as an explanation of a few effects exceptionally met with.

According to the *neurosis-theory*, the hypnotic state is a peculiar pathological condition into which certain predisposed patients fall, and in which special physical agents have the power of provoking special symptoms, quite apart from the subjects mentally expecting the effect. Professor Charcot and his colleagues at the Salpêtrière hospital admit that this condition is rarely found in typical form. They call it then *le grand hypnotisme*, and say that it accompanies the disease hystero-epilepsy. If a patient subject to this sort of hypnotism hear a sudden loud noise, or look at a bright light unexpectedly, she falls into the *cataleptic* trance. Her limbs and body offer no resistance to movements communicated to them, but retain permanently the attitudes impressed. The eyes are staring, there is insensibility to pain, etc., etc. If the eyelids be forcibly closed, the cataleptic gives place to the *lethargic* condition, characterized by apparent abolition of consciousness, and absolute muscular relaxation except where the muscles are kneaded or the tendons struck by the operator's hand, or certain nerve-trunks are pressed upon. Then the muscles in question, or those supplied by the same nerve-trunk enter into a more or less steadfast tonic contraction. Charcot calls this symptom by the name of neuro-muscular hyperexcitability. The lethargic state may be *primarily* brought on by fixedly looking at anything, or by pressure on the closed eyeballs. Friction on the top of the head will make the patient pass from either of the two preceding conditions into the *somnambulic* state, in which she is alert, talkative, and susceptible to all the suggestions of the operator. The somnambulic state may also be induced primarily, by fixedly looking at a small object. In this state the accurately limited muscular contractions characteristic of lethargy do not follow upon the above-described manipulations, but instead of them there is a tendency to rigidity of entire regions of the body, which may upon occasion develop into general tetanus,

and which is brought about by gently touching the skin or blowing upon it. M. Charcot calls this by the name of cutaneo-muscular hyperexcitability.

Many other symptoms, supposed by their observers to be independent of mental expectation, are described, of which I only will mention the more interesting. Opening the eyes of a patient in lethargy causes her to pass into catalepsy. If one eye only be opened, the corresponding half of the body becomes cataleptic, whilst the other half remains in lethargy. Similarly, rubbing one side of the head may result in a patient becoming hemilethargic or hemicataleptic and hemisomnambolic. The approach of a magnet (or certain metals) to the skin causes these half-states (and many others) to be transferred to the opposite sides. Automatic repetition of every sound heard (*'echolalia'*) is said to be produced by pressure on the lower cervical vertebræ or on the epigastrium. *Aphasia* is brought about by rubbing the head over the region of the speech-centre. Pressure behind the occiput determines *movements of imitation*. Heidenhain describes a number of curious automatic tendencies to movement, which are brought about by stroking various portions of the vertebral column. Certain other symptoms have been frequently noticed, such as a flushed face and cold hands, brilliant and congested eyes, dilated pupils. Dilated retinal vessels and spasm of the accommodation are also reported.

The theory of Suggestion denies that there is any special hypnotic *state* worthy of the name of trance or neurosis. All the symptoms above described, as well as those to be described hereafter, are results of that mental susceptibility which we all to some degree possess, of yielding assent to outward suggestion, of affirming what we strongly conceive, and of acting in accordance with what we are made to expect. The bodily symptoms of the Salpêtrière patients are all of them results of expectation and training. The first patients accidentally did certain things which their doctors thought typical and caused to be repeated. The subsequent subjects 'caught on' and followed the established tradition. In proof of this the fact is urged that the classical three stages and their grouped symptoms have *only* been reported as spontaneously occurring, so far, at the Salpêtrière, though they may be superinduced by deliberate suggestion, in patients anywhere

found. The ocular symptoms, the flushed face, accelerated breathing, etc., are said not to be symptoms of the passage into the hypnotic state as such, but merely consequences of the strain on the eyes when the method of looking at a bright object is used. They are absent in the subjects at Nancy, where simple verbal suggestion is employed. The various reflex effects (aphasia, echolalia, imitation, etc.) are but habits induced by the influence of the operator, who unconsciously urges the subject into the direction in which he would prefer to have him go. The influence of the magnet, the opposite effects of upward and downward passes, etc., are similarly explained. Even that sleepy and inert condition, the advent of which seems to be the prime condition of farther symptoms being developed, is said to be merely due to the fact that the mind expects it to come; whilst its influence on the other symptoms is not physiological, so to speak, but psychical, its own easy realization by suggestion simply encouraging the subject to expect that ulterior suggestions will be realized with equal ease. The radical defenders of the suggestion-theory are thus led to deny the very existence of the hypnotic state, in the sense of a peculiar trance-like condition which deprives the patient of spontaneity and makes him passive to suggestion from without. The trance itself is only one of the suggestions, and many subjects in fact can be made to exhibit the other hypnotic phenomena without the preliminary induction of this one.

The theory of suggestion may be said to be quite triumphant at the present day over the neurosis-theory as held at the Salpêtrière, with its three states, and its definite symptoms supposed to be produced by physical agents apart from co-operation of the subject's mind. But it is one thing to say this, and it is quite another thing to say that there is no peculiar physiological condition whatever worthy of the name of hypnotic trance, no peculiar state of nervous equilibrium, 'hypotaxy,' 'dissociation,' or whatever you please to call it, during which the subject's susceptibility to outward suggestion is greater than at ordinary times. All the facts seem to prove that, until this trance-like state is assumed by the patient, suggestion produces very insignificant results, but that, when it is once assumed, there are no limits to suggestion's power. The state in question has many affinities with ordinary

sleep. It is probable, in fact, that we all pass through it transiently whenever we fall asleep; and one might most naturally describe the usual relation of operator and subject by saying that the former keeps the latter suspended between waking and sleeping by talking to him enough to keep his slumber from growing profound, and yet not in such a way as to wake him up. A hypnotized patient, *left to himself*, will either fall sound asleep or wake up entirely. The difficulty in hypnotizing refractory persons is that of catching them at the right moment of transition and making it permanent. Fixing the eyes and relaxing the muscles of the body produce the hypnotic state just as they facilitate the advent of sleep. The first stages of ordinary sleep are characterized by a peculiar dispersed attitude of the attention. Images come before consciousness which are entirely incongruous with our ordinary beliefs and habits of thought. The latter either vanish altogether or withdraw, as it were, inertly into the background of the mind, and let the incongruous images reign alone. These images acquire, moreover, an exceptional vivacity; they become first 'hypnagogic hallucinations,' and then, as the sleep grows deeper, dreams. Now the 'mono-ideism,' or else the impotency and failure to 'rally' on the part of the background-ideas, which thus characterize somnolence, are unquestionably the result of a special physiological change occurring in the brain at that time. Just so that similar mono-ideism, or dissociation of the reigning fancy from those other thoughts which might possibly act as its 'reductives,' which characterize the hypnotic consciousness, must equally be due to a special cerebral change. The term 'hypnotic trance,' which I employ, tells us nothing of what the change is, but it marks the fact that it exists, and is consequently a useful expression. The great vivacity of the hypnotic images (as gauged by their motor effects), the oblivion of them when normal life is resumed, the abrupt awakening, the recollection of them again in subsequent trances, the anæsthesia and hyperæsthesia which are so frequent, all point away from our simple waking credulity and 'suggestibility' as the type by which the phenomena are to be interpreted, and make us look rather towards sleep and dreaming, or towards those deeper alterations of the personality known as automatism, double consciousness, or 'second' personality for the true analogues of the hypnotic trance.^[515] Even the best hypnotic subjects pass through life without any one suspecting them to possess such a remarkable susceptibility, until by deliberate experiment it is made manifest. The operator fixes their eyes or their attention a short time to develop the

propitious phase, holds them in it by his talk, and *the state being there*, makes them the puppets of all his suggestions. But no ordinary suggestions of waking life ever took such control of their mind.

The suggestion-theory may therefore be approved as correct, provided we grant the trance-state as its prerequisite. The three states of Charcot, the strange reflexes of Heidenhain, and all the other bodily phenomena which have been called direct consequences of the trance-state itself, are not such. They are products of suggestion, the trance-state having no particular outward symptoms of its own; but without the trance-state there, those particular suggestions could never have been successfully made.^[516]

THE SYMPTOMS OF THE TRANCE.

This accounts for the altogether indefinite array of symptoms which have been gathered together as characteristic of the hypnotic state. The law of habit dominates hypnotic subjects even more than it does waking ones. Any sort of personal peculiarity, any trick accidentally fallen into in the first instance by some one subject, may, by attracting attention, become stereotyped, serve as a pattern for imitation, and figure as the type of a school. The first subject trains the operator, the operator trains the succeeding subjects, all of them in perfect good faith conspiring together to evolve a perfectly arbitrary result. With the extraordinary perspicacity and subtlety of perception which subjects often display for all that concerns the operator with whom they are *en rapport*, it is hard to keep them ignorant of anything which he expects. Thus it happens that one easily verifies on new subjects what one has already seen on old ones, or any desired symptom of which one may have heard or read.

The symptoms earliest observed by writers were all thought to be typical. But with the multiplication of observed phenomena, the importance of most particular symptoms as marks of the state has diminished. This lightens very much our own immediate task. Proceeding to enumerate the symptoms of the hypnotic trance, I may confine myself to those which are intrinsically interesting, or which differ considerably from the normal functions of man.

First of all comes *amnesia*. In the earlier stages of hypnotism the patient remembers what has happened, but with successive sittings he sinks into a deeper condition, which is commonly followed by complete loss of memory. He may have been led through the liveliest hallucinations and dramatic performances, and have exhibited the intensest apparent emotion, but on waking he can recall nothing at all. The same thing happens on waking from sleep in the midst of a dream—it quickly eludes recall. But just as we may be *reminded* of it, or of parts of it, by meeting persons or objects which figured therein, so on being adroitly prompted, the hypnotic patient will often remember what happened in his trance. One cause of the forgetfulness seems to be the disconnection of the trance performances with the system of waking ideas. Memory requires a continuous train of association. M. Delbœuf, reasoning in this way, woke his subjects in the midst of an action begun during trance (washing the hands, e.g.), and found that they then remembered the trance. The act in question bridged over the two states. But one can often make them remember by merely telling them during the trance that they *shall* remember. Acts of one trance, moreover, are usually recalled, either spontaneously or at command, during another trance, provided that the contents of the two trances be not mutually incompatible.

Suggestibility. The patient believes everything which his hypnotizer tells him, and does everything which the latter commands. Even results over which the will has normally no control, such as sneezing, secretion, reddening and growing pale, alterations of temperature and heart-beat, menstruation, action of the bowels, etc., may take place in consequence of the operator's firm assertions during the hypnotic trance, and the resulting conviction on the part of the subject, that the effects will occur. Since almost all the phenomena yet to be described are effects of this heightened suggestibility, I will say no more under the general head, but proceed to illustrate the peculiarity in detail.

Effects on the voluntary muscles seem to be those most easily got; and the ordinary routine of hypnotizing consists in provoking them first. Tell the patient that he cannot open his eyes or his mouth, cannot unclasp his hands or lower his raised arm, cannot rise from his seat, or pick up a certain object from the floor, and he will be immediately smitten with absolute impotence in these regards. The effect here is generally due to the *involuntary*

contraction of antagonizing muscles. But one can equally well suggest *paralysis*, of an arm for example, in which case it will hang perfectly placid by the subject's side. Cataleptic and tetanic rigidity are easily produced by suggestion, aided by handling the parts. One of the favorite shows at public exhibitions is that of a subject stretched stiff as a board with his head on one chair and his heels on another. The cataleptic retention of impressed attitudes differs from voluntary assumption of the same attitude. An arm voluntarily held out straight will drop from fatigue after a quarter of an hour at the utmost, and before it falls the agent's distress will be made manifest by oscillations in the arm, disturbances in the breathing, etc. But Charcot has shown that an arm held out in hypnotic catalepsy, though it may as soon descend, yet does so slowly and with no accompanying vibration, whilst the breathing remains entirely calm. He rightly points out that this shows a profound physiological change, and is proof positive against simulation, as far as this symptom is concerned. A cataleptic attitude, moreover, may be held for many hours.—Sometimes an expressive attitude, clinching of the fist, contraction of the brows, will gradually set up a sympathetic action of the other muscles of the body, so that at last a *tableau vivant* of fear, anger, disdain, prayer, or other emotional condition, is produced with rare perfection. This effect would seem to be due to the suggestion of the mental state by the first contraction. Stammering, aphasia, or inability to utter certain words, pronounce certain letters, are readily producible by suggestion.

Hallucinations of all the senses and *delusions* of every conceivable kind can be easily suggested to good subjects. The emotional effects are then often so lively, and the pantomimic display so expressive, that it is hard not to believe in a certain 'psychic hyper-excitability,' as one of the concomitants of the hypnotic condition. You can make the subject think that he is freezing or burning, itching or covered with dirt, or wet; you can make him eat a potato for a peach, or drink a cup of vinegar for a glass of champagne;^[517] ammonia will smell to him like cologne water; a chair will be a lion, a broom-stick a beautiful woman, a noise in the street will be an orchestral music, etc., etc., with no limit except your powers of invention and the patience of the lookers on.^[518] Illusions and hallucinations form the *pièces de résistance* at public exhibitions. The comic effect is at its climax when it is successfully suggested to the subject that his personality is changed into

that of a baby, of a street boy, of a young lady dressing for a party, of a stump orator, or of Napoleon the Great. He may even be transformed into a beast, or an inanimate thing like a chair or a carpet, and in every case will act out all the details of the part with a sincerity and intensity seldom seen at the theatre. The excellence of the performance is in these cases the best reply to the suspicion that the subject may be shamming—so skilful a shammer must long since have found his true function in life upon the stage. Hallucinations and histrionic delusions generally go with a certain depth of the trance, and are followed by complete forgetfulness. The subject awakens from them at the command of the operator with a sudden start of surprise, and may seem for a while a little dazed.

Subjects in this condition will receive and execute suggestions of crime, and act out a theft, forgery, arson, or murder. A girl will believe that she is married to her hypnotizer, etc. It is unfair, however, to say that in these cases the subject is a pure puppet with no spontaneity. His spontaneity is certainly not in abeyance so far as things go which are harmoniously associated with the suggestion given him. He takes the text from his operator; but he may amplify and develop it enormously as he acts it out. His spontaneity is lost only for those systems of ideas which *conflict* with the suggested delusion. The latter is thus 'systematized'; the rest of consciousness is shut off, excluded, dissociated from it. In extreme cases the rest of the mind would seem to be actually abolished and the hypnotic subject to be literally a changed personality, a being in one of those 'second' states which we studied in Chapter X. But the reign of the delusion is often not as absolute as this. If the thing suggested be too intimately repugnant, the subject may strenuously resist and get nervously excited in consequence, even to the point of having an hysterical attack. The conflicting ideas slumber in the background and merely permit those in the foreground to have their way until a *real* emergency arises; then they assert their rights. As M. Delbœuf says, the subject surrenders himself good-naturedly to the performance, stabs with the pasteboard dagger you give him because he knows what it is, and fires off the pistol because he knows it has no ball; but for a real murder he would not be your man. It is undoubtedly true that subjects are often well aware that they are acting a part. They know that what they do is absurd. They know that the hallucination which they see, describe, and act upon, is not really there. They may laugh at themselves; and they always recognize the abnormality

of their state when asked about it, and call it 'sleep.' One often notices a sort of mocking smile upon them, as if they were playing a comedy, and they may even say on 'coming to' that they were shamming all the while. These facts have misled ultra-skeptical people so far as to make them doubt the genuineness of any hypnotic phenomena at all. But, save the consciousness of 'sleep,' they do not occur in the deeper conditions; and when they do occur they are only a natural consequence of the fact that the 'monoideism' is incomplete. The background-thoughts still exist, and have the power of *comment* on the suggestions, but no power to inhibit their motor and associative effects. A similar condition is frequent enough in the waking state, when an impulse carries us away and our 'will' looks on wonderingly like an impotent spectator. These 'shammers' continue to sham in just the same way, every new time you hypnotize them, until at last they are forced to admit that if shamming there be, it is something very different from the free voluntary shamming of waking hours.

Real sensations may be abolished as well as false ones suggested. Legs and breasts may be amputated, children born, teeth extracted, in short the most painful experiences undergone, with no other anæsthetic than the hypnotizer's assurance that no pain shall be felt. Similarly morbid pains may be annihilated, neuralgias, toothaches, rheumatisms cured. The sensation of hunger has thus been abolished, so that a patient took no nourishment for fourteen days. The most interesting of these suggested anæsthesias are those limited to certain objects of perception. Thus a subject may be made blind to a certain person and to him alone, or deaf to certain words but to no others.^[519] In this case the anæsthesia (or *negative hallucination*, as it has been called) is apt to become *systematized*. Other things related to the person to whom one has been made blind may also be shut out of consciousness. What he says is not heard, his contact is not felt, objects which he takes from his pocket are not seen, etc. Objects which he screens are seen as if he were transparent. Facts about him are forgotten, his name is not recognized when pronounced. Of course there is great variety in the completeness of this systematic extension of the suggested anæsthesia, but one may say that some tendency to it always exists. When one of the subjects' own limbs is made anæsthetic, for example, memories as well as sensations of its movements often seem to depart. An interesting degree of the phenomenon is found in the case related by M. Binet of a subject to whom it was suggested that a certain M. C. was invisible. She still saw M.

C., but saw him as a stranger, having lost the memory of his name and his existence.—Nothing is easier than to make subjects forget their own name and condition in life. It is one of the suggestions which most promptly succeed, even with quite fresh ones. A systematized amnesia of certain periods of one's life may also be suggested, the subject placed, for instance, where he was a decade ago with the intervening years obliterated from his mind.

The mental condition which accompanies these systematized anæsthesias and amnesias is a very curious one. The anæsthesia is not a genuine sensorial one, for if you make a real red cross (say) on a sheet of white paper invisible to an hypnotic subject, and yet cause him to look fixedly at a dot on the paper on or near the cross, he will, on transferring his eye to a blank sheet, see a bluish-green after-image of the cross. This proves that it has impressed his sensibility. He has *felt* it, but not *perceived* it. He had actively ignored it, refused to recognize it, as it were. Another experiment proves that he must *distinguish* it first in order thus to ignore it. Make a stroke on paper or blackboard, and tell the subject it is not there, and he will see nothing but the clean paper or board. Next, he not looking, surround the original stroke with other strokes exactly like it, and ask him what he sees. He will point out one by one all the new strokes and omit the original one every time, no matter how numerous the new strokes may be, or in what order they are arranged. Similarly, if the original single stroke to which he is blind be *doubled* by a prism of sixteen degrees placed before one of his eyes (both being kept open), he will say that he now sees *one* stroke, and point in the direction in which the image seen through the prism lies.

Obviously, then, he is not blind to the *kind* of stroke in the least. He is blind only to one individual stroke of that kind in a particular position on the board or paper,—that is, to a particular complex object; and, paradoxical as it may seem to say so, he must distinguish it with great accuracy from others like it, in order to remain blind to it when the others are brought near. He 'apperceives' it, as a preliminary to not seeing it at all! How to conceive of this state of mind is not easy. It would be much simpler to understand the process, if adding new strokes made the first one visible. There would then be two different objects apperceived as totals,—paper with one stroke, paper with two strokes; and, blind to the former, he would see all that was

in the latter, because he would have apperceived it as a different total in the first instance.

A process of this sort occurs sometimes (not always) when the new strokes, instead of being mere repetitions of the original one, are lines which combine with it into a total object, say a human face. The subject of the trance then may regain his sight of the line to which he had previously been blind, by seeing it as part of the face.

When by a prism before one eye a previously invisible line has been made visible to that eye, and the other eye is closed or screened, *its* closure makes no difference; the line still remains visible. But if *then* the prism is removed, the line will disappear even to the eye which a moment ago saw it, and both eyes will revert to their original blind state.

We have, then, to deal in these cases neither with a sensorial anæsthesia, nor with a mere failure to notice, but with something much more complex; namely, an active counting out and positive exclusion of certain objects. It is as when one 'cuts' an acquaintance, 'ignores' a claim, or 'refuses to be influenced' by a consideration of whose existence one remains aware. Thus a lover of Nature in America finds himself able to overlook and ignore entirely the board- and rail-fences and general roadside raggedness, and revel in the beauty and picturesqueness of the other elements of the landscape, whilst to a newly-arrived European the fences are so aggressively present as to spoil enjoyment.

Messrs. Gurney, Janet, and Binet have shown that the ignored elements are preserved in a split-off portion of the subjects' consciousness which can be tapped in certain ways, and made to give an account of itself (see Vol. I. p. 209).

Hyperæsthesia of the senses is as common a symptom as anæsthesia. On the skin two points can be discriminated at less than the normal distance. The sense of touch is so delicate that (as M. Delbœuf informs me) a subject after simply poising on her finger-tips a blank card drawn from a pack of similar ones can pick it out from the pack again by its 'weight.' We approach here the line where, to many persons, it seems as if something more than the ordinary senses, however sharpened, were required in explanation. I have seen a coin from the operator's pocket repeatedly picked out by the subject from a heap of twenty others,^[520] by its greater 'weight' in the subject's

language.—Auditory hyperæsthesia may enable a subject to hear a watch tick, or his operator speak, in a distant room.—One of the most extraordinary examples of visual hyperæsthesia is that reported by Bergson, in which a subject who seemed to be reading through the back of a book held and looked at by the operator, was really proved to be reading the image of the page reflected on the latter's cornea. The same subject was able to discriminate with the naked eye details in a microscopic preparation. Such cases of 'hyperæsthesia of vision' as that reported by Taguet and Sauvaire, where subjects could see things mirrored by non-reflecting bodies, or through opaque pasteboard, would seem rather to belong to 'psychical research', than to the present category.—The ordinary test of visual hyperacuteness in hypnotism is the favorite trick of giving a subject the hallucination of a picture on a blank sheet of card-board, and then mixing the latter with a lot of other similar sheets. The subject will always find the picture on the original sheet again, and recognize infallibly if it has been turned over, or upside down, although the bystanders have to resort to artifice to identify it again. The Subject notes peculiarities on the card, too small for waking observation to detect.^[521] If it be said that the spectators guide him by their manner, their breathing, etc., that is only another proof of his hyperæsthesia; for he undoubtedly *is* conscious of subtler personal indications (of his operator's mental states especially) than he could notice in his waking state. Examples of this are found in the so-called '*magnetic rapport*.' This is a name for the fact that in deep trance, or in lighter trance whenever the suggestion is made, the subject is deaf and blind to everyone but the operator or those spectators to whom the latter expressly awakens his senses. The most violent appeals from anyone else are for him as if non-existent, whilst he obeys the faintest signals on the part of his hypnotizer. If in catalepsy, his limbs will retain their attitude only when the operator moves them; when others move them they fall down, etc. A more remarkable fact still is that the patient will often answer anyone whom his operator touches, or at whom he even points his finger, in however concealed a manner. All which is rationally explicable by expectation and suggestion, if only it be farther admitted that his senses are acutely sharpened for all the operator's movements.^[522] He often shows great anxiety and restlessness if the latter is out of the room. A favorite experiment of Mr. E. Gurney's was to put the subject's hands through an opaque screen, and cause the operator to point at one finger. *That* finger

presently grew insensible or rigid. A bystander pointing simultaneously at another finger, never made that insensible or rigid. Of course the elective *rapport* with their operator had been developed in these trained subjects during the hypnotic state, but the phenomenon then occurred in some of them during the waking state, even when their consciousness was absorbed in animated conversation with a fourth party.^[523] I confess that when I saw these experiments I was impressed with the necessity for admitting between the *emanations* from different people differences for which we have no name, and a discriminative sensibility for them of the nature of which we can form no clear conception, but which seems to be developed in certain subjects by the hypnotic trance.—The enigmatic reports of the effect of magnets and metals, even if they be due, as many contend, to unintentional suggestion on the operator's part, certainly involve hyperæsthetic perception, for the operator seeks as well as possible to conceal the moment when the magnet is brought into play, and yet the subject not only finds it out that moment in a way difficult to understand, but may develop effects which (in the first instance certainly) the operator did not expect to find. Unilateral contractures, movements, paralyses, hallucinations, etc., are made to pass to the other side of the body, hallucinations to disappear, or to change to the complementary color, suggested emotions to pass into their opposites, etc. Many Italian observations agree with the French ones, and the upshot is that if unconscious suggestion lie at the bottom of this matter, the patients show an enormously exalted power of divining what it is they are expected to do. This hyperæsthetic perception is what concerns us now.^[524] Its *modus* cannot yet be said to be defined.

Changes in the nutrition of the tissues may be produced by suggestion. These effects lead into therapeutics—a subject which I do not propose to treat of here. But I may say that there seems no reasonable ground for doubting that in certain chosen subjects the suggestion of a congestion, a burn, a blister, a raised papule, or a bleeding from the nose or skin, may produce the effect. Messrs. Beaunis, Berjon, Bernheim, Bourru, Burot, Charcot, Delbœuf, Dumontpallier, Focachon, Forel, Jendrássik, Krafft-Ebing, Liébeault, Liégeois, Lipp, Mabile, and others have recently vouched for one or other of these effects. Messrs. Delbœuf and Liégeois have annulled by suggestion, one the effects of a burn, the other of a blister. Delbœuf was led to his experiments after seeing a burn on the skin produced by suggestion, at the Salpêtrière, by reasoning that if the idea of a pain could produce inflammation it must be because pain was itself an inflammatory irritant, and that the abolition of it from a real burn ought therefore to entail the absence of inflammation. He applied the actual cautery (as well as vesicants) to symmetrical places on the skin, affirming that no pain should be felt on one of the sides. The result was a dry scorch on that side, with (as he assures me) no after-mark, but on the other side a regular blister with suppuration and a subsequent scar. This explains the innocuity of certain assaults made on subjects during trance. To test simulation, recourse is often had to sticking pins under their finger-nails or through their tongue, to inhalations of strong ammonia, and the like. These irritations, when not felt by the subject, seem to leave no after-consequences. One is reminded of the reported non-inflammatory character of the wounds made on themselves by dervishes in their pious orgies. On the other hand, the reddenings and bleedings of the skin along certain lines, suggested by tracing lines or pressing objects thereupon, put the accounts handed down to us of the stigmata of the cross appearing on the hands, feet, sides, and forehead of certain Catholic mystics in a new light. As so often happens, a fact is denied until a welcome interpretation comes with it. Then it is admitted readily enough; and evidence judged quite insufficient to back a claim, so long as the church had an interest in making it, proves to be quite sufficient for modern scientific enlightenment, the moment it appears that a reputed saint can thereby be classed as 'a case of hystero-epilepsy.'

There remain two other topics, viz., post-hypnotic effects of suggestion, and effects of suggestion in the waking state.

Post-hypnotic, or deferred, suggestions are such as are given to the patients during trance, to take effect after waking. They succeed with a certain number of patients even when the execution is named for a remote period—months or even a year, in one case reported by M. Liégeois. In this way one can make the patient feel a pain, or be paralyzed, or be hungry or thirsty, or have an hallucination, positive or negative, or perform some fantastic action after emerging from his trance. The effect in question may be ordered to take place not immediately, but after an interval of time has elapsed, and the interval may be left to the subject to measure, or may be marked by a certain signal. The moment the signal occurs, or the time is run out, the subject, who until then seems in a perfectly normal waking condition, will experience the suggested effect. In many instances, whilst thus obedient to the suggestion, he seems to fall into the hypnotic condition again. This is proved by the fact that the moment the hallucination or suggested performance is over he forgets it, denies all knowledge of it, and so forth; and by the further fact that he is 'suggestible' during its performance, that is, will receive new hallucinations, etc., at command. A moment later and this suggestibility has disappeared. It cannot be said, however, that relapse into the trance is an absolutely necessary condition for the post-hypnotic carrying out of commands, for the subject may be neither suggestible nor amnesic, and may struggle with all the strength of his will against the absurdity of this impulse which he feels rising in him, he knows not why. In these cases, as in most cases, he forgets the circumstance of the impulse having been suggested to him in a previous trance; regards it as arising within himself; and often improvises, as he yields to it, some more or less plausible or ingenious motive by which to justify it to the lookers-on. He acts, in short, with his usual sense of personal spontaneity and freedom; and the disbelievers in the freedom of the will have naturally made much of these cases in their attempts to show it to be an illusion.

The only really mysterious feature of these deferred suggestions is the patient's absolute ignorance during the interval preceding their execution that they have been deposited in his mind. They will often surge up at the preappointed time, even though you have vainly tried a while before to make him recall the circumstances of their production. The most important

class of post-hypnotic suggestions are, of course, those relative to the patient's health—bowels, sleep, and other bodily functions. Among the most *interesting* (apart from the hallucinations) are those relative to future trances. One can determine the hour and minute, or the signal, at which the patient will of his own accord lapse into trance again. One can make him susceptible in future to another operator who may have been unsuccessful with him in the past. Or more important still in certain cases, one can, by suggesting that certain persons shall never be able hereafter to put him to sleep, remove him for all future time from hypnotic influences which might be dangerous. This, indeed, is the simple and natural safeguard against those 'dangers of hypnotism' of which uninstructed persons talk so vaguely. A subject who knows himself to be ultra-susceptible should never allow himself to be entranced by an operator in whose moral delicacy he lacks complete confidence; and he can use a trusted operator's suggestions to protect himself against liberties which others, knowing his weakness, might be tempted to take with him.

The mechanism by which the command is retained until the moment for its execution arrives is a mystery which has given rise to much discussion. The experiments of Gurney and the observations of M. Pierre Janet and others on certain hysterical somnabulists seem to prove that it is stored up in consciousness; not simply organically registered, but that *the consciousness which thus retains it is split off, dissociated from the rest of the subject's mind*. We have here, in short, an experimental production of one of those 'second' states of the personality of which we have spoken so often. Only here the second state coexists as well as alternates with the first. Gurney had the brilliant idea of *tapping* this second consciousness by means of the planchette. He found that certain persons, who were both hypnotic subjects and automatic writers, would if their hands were placed on a planchette (after being wakened from a trance in which they had received the suggestion of something to be done at a later time) write out unconsciously the order, or something connected with it. This shows that something inside of them, which could express itself through the hand alone, was continuing to think of the order, and possibly of it alone. These researches have opened a new vista of possible experimental investigations into the so-called 'second' states of the personality.

Some subjects seem almost as obedient to suggestion in the waking state as in sleep, or even more so, according to certain observers. Not only muscular phenomena, but changes of personality and hallucinations are recorded as the result of simple affirmation on the operator's part, without the previous ceremony of 'magnetizing' or putting into the 'mesmeric sleep.' These are all trained subjects, however, so far as I know, and the affirmation must apparently be accompanied by the patient concentrating his attention and gazing, however briefly, into the eyes of the operator. It is probable therefore that an extremely rapidly induced condition of trance is a prerequisite for success in these experiments.

I have now made mention of all the more important phenomena of the hypnotic trance. Of their therapeutic or forensic bearings this is not the proper place to speak. The recent literature of the subject is quite voluminous, but much of it consists in repetition. The best compendious work on the subject is 'Der Hypnotismus,' by Dr. A. Moll (Berlin, 1889; and just translated into English, N. Y., 1890), which is extraordinarily complete and judicious. The other writings most recommendable are subjoined in the note.^[525] Most of them contain a historical sketch and much bibliography. A complete bibliography has been published by M. Dessoir (Berlin, 1888).

[513] It should be said that the methods of leaving the patient to himself, and that of the simple verbal suggestion of sleep (the so-called Nancy method introduced by Liébeault of that place), seem, wherever applicable, to be the best, as they entail none of the after-inconveniences which occasionally follow upon straining his eyes. A new patient should not be put through a great variety of different suggestions in immediate succession. He should be waked up from time to time, and then rehypnotized to avoid mental confusion and excitement. Before finally waking a subject you should *undo* whatever delusive suggestions you may have implanted in him, by telling him that they are all gone, etc., and that you are now going to restore him to his natural state. Headache, languor, etc., which sometimes follow the first trance or two, must be banished at the outset, by the operator strongly assuring the subject that such things *never* come from hypnotism, that the subject *must not* have them, etc.

[514] Certain facts would seem to point that way. Cf., e.g., the case of the man described by P. Despine, *Étude Scientifique sur le Somnambulisme*, p. 286 ff.

[515] The state is not *identical* with sleep, however analogous in certain respects. The lighter stages of it, particularly, differ from sleep and dreaming, inasmuch as they are characterized almost exclusively by *muscular* inabilities and compulsions, which are not noted in ordinary somnolence, and the *mind*, which is confused in somnolence, may be quite clearly conscious, in the lighter state of trance, of all that is going on.

[516] The word 'suggestion' has been bandied about too much as if it explained all mysteries: When the subject obeys it is by reason of the 'operator's suggestion'; when he proves refractory it is in consequence of an 'auto-suggestion' which he has made to himself, etc., etc. What explains everything explains nothing; and it must be remembered that what *needs* explanation here is the fact that in a certain condition of the subject suggestions operate as they do *at no other time*; that through them functions are affected which ordinarily elude the action of the waking will; and that usually all this happens in a condition of which no after-memory remains.

[517] A complete fit of drunkenness may be the consequence of the suggested champagne. It is even said that real drunkenness has been cured by suggestion.

[518] The suggested hallucination may be followed by a negative after-image, just as if it were a real object. This can be very easily verified with the suggested hallucination of a colored cross on a sheet of white paper. The subject, on turning to another sheet of paper, will see a cross of the complementary color. Hallucinations have been shown by MM. Binet and Féré to be doubled by a prism or mirror, magnified by a lens, and in many other ways to behave optically like real objects. These points have been discussed already on [p. 138](#) ff.

[519] M. Liégeois explains the common exhibition-trick of making the subject unable to get his arms into his coat-sleeves again after he has taken his coat off, by an *anæsthesia* to the necessary parts of the coat.

[520] Precautions being taken against differences of temperature and other grounds of suggestion.

[521] It should be said, however, that the bystander's ability to discriminate unmarked cards and sheets of paper from each other is much greater than one would naturally suppose.

[522] I must repeat, however, that we are here on the verge of possibly unknown forces and modes of communication. Hypnotization at a distance, with no grounds for expectation on the subject's part that it was to be tried, seems pretty well established in certain very rare cases. See in general, for information on these matters, the Proceedings of the Soc. for Psych. Research, *passim*.

[523] Here again the perception in question must take place below the threshold of ordinary consciousness, possibly in one of those split-off selves or 'second' states whose existence we have so often to recognize.

[524] I myself verified many of the above effects of the magnet on a blindfolded subject on whom I was trying them for the first time, and whom I believe to have never heard of them before. The moment, however, an opaque screen was added to the blindfolding, the effects ceased to coincide with the approximation of the magnet, so that it looks as if visual perception had been instrumental in producing them. The subject passed from my observation, so that I never could clear up the mystery. Of course I gave him consciously no hint of what I was looking for.

[525] Binet and Féré, 'Animal Magnetism,' in the International Scientific Series; A. Bernheim, 'Suggestive Therapeutics' (N. Y., 1889); J. Liégeois, 'De la Suggestion' (1889); E. Gurney, two articles in *Mind*, vol. ix.—In the recent revival of interest in the history of this subject, it seems a pity that the admirably critical and scientific work of Dr. John Kearsley Mitchell of Philadelphia should remain relatively so unknown. It is quite worthy to rank with Braid's investigations. See "Five Essays" by the above author, edited by S. Weir Mitchell, Philadelphia, 1859, pp. 141-274.

CHAPTER XXVIII.

NECESSARY TRUTHS AND THE EFFECTS OF EXPERIENCE.

In this final chapter I shall treat of what has sometimes been called *psychogenesis*, and try to ascertain just how far the connections of things in the outward environment can account for our tendency to think of, and to react upon, certain things in certain ways and in no others, even though personally we have had of the things in question no experience, or almost no experience, at all. It is a familiar truth that some propositions are *necessary*. We *must* attach the predicate 'equal' to the subject 'opposite sides of a parallelogram' if we think those terms together at all, whereas we need not in any such way attach the predicate 'rainy,' for example, to the subject 'to-morrow.' The dubious sort of coupling of terms is universally admitted to be due to 'experience'; the certain sort is ascribed to the 'organic structure' of the mind. This structure is in turn supposed by the so-called *apriorists* to be of transcendental origin, or at any rate not to be explicable by experience; whilst by evolutionary empiricists it is supposed to be also due to experience, only not to the experience of the individual, but to that of his ancestors as far back as one may please to go. Our emotional and instinctive tendencies, our irresistible impulses to couple certain movements with the perception or thought of certain things, are also features of our connate mental structure, and like the necessary judgments, are interpreted by the apriorists and the empiricists in the same warring ways.

I shall try in the course of the chapter to make plain three things:

- 1) That, taking the word experience as it is universally understood, the experience of the race can no more account for our necessary or *a priori* judgments than the experience of the individual can;
- 2) That there is no good evidence for the belief that our instinctive reactions are fruits of our ancestors' education in the midst of the same environment, transmitted to us at birth.
- 3) That the features of our organic mental structure cannot be explained at all by our conscious intercourse with the outer environment, but must rather

be understood as congenital variations, 'accidental'^[526] in the first instance, but then transmitted as fixed features of the race.

On the whole, then, the account which the apriorists give of the *facts* is that which I defend; although I should contend (as will hereafter appear) for a naturalistic view of their *cause*.

The first thing I have to say is that all schools (however they otherwise differ) must allow that the *elementary qualities* of cold, heat, pleasure, pain, red, blue, sound, silence, etc., are original, innate, or *a priori* properties of our subjective nature, even though they should require the touch of experience to waken them into actual consciousness, and should slumber, to all eternity, without it.

This is so on either of the two hypotheses we may make concerning the relation of the feelings to the realities at whose touch they become alive. For in the first place, if a feeling do *not* mirror the reality which wakens it and to which we say it corresponds, if it mirror no reality whatever outside of the mind, it of course is a purely mental product. By its very definition it can be nothing else. But in the second place, even if it *do* mirror the reality exactly, still it *is* not that reality itself, it is a duplication of it, the result of a mental reaction. And that the mind should have the power of reacting in just that duplicate way can only be stated as a *harmony* between its nature and the nature of the truth outside of it, a harmony whereby it follows that the qualities of both parties match.

The originality of these *elements* is not, then, a question for dispute. *The warfare of philosophers is exclusively relative to their* FORMS OF COMBINATION. The empiricist maintains that these forms can only follow the order of combination in which the elements were originally awakened by the impressions of the external world; the apriorists insist, on the contrary, that *some* modes of combination, at any rate, follow from the natures of the elements themselves, and that no amount of experience can modify this result.

WHAT IS MEANT BY EXPERIENCE?

The phrase 'organic mental structure' names the matter in dispute. Has the mind such a structure or not? Are its contents *arranged* from the start, or is the arrangement they may possess simply due to the shuffling of them by experience in an absolutely plastic bed? Now the first thing to make sure of is that when we talk of 'experience,' we attach a definite meaning to the word. *Experience means experience of something foreign supposed to impress us*, whether spontaneously or in consequence of our own exertions and acts. Impressions, as we well know, affect certain orders of sequence and coexistence, and the mind's habits copy the habits of the impressions, so that our images of things assume a time- and space-arrangement which resembles the time- and space-arrangements outside. To uniform outer coexistences and sequences correspond constant conjunctions of ideas, to fortuitous coexistences and sequences casual conjunctions of ideas. We are sure that fire will burn and water wet us, less sure that thunder will come after lightning, not at all sure whether a strange dog will bark at us or let us go by. In these ways experience moulds us every hour, and makes of our minds a mirror of the time- and space-connections between the things in the world. The principle of habit within us so *fixes* the copy at last that we find it difficult even to imagine how the outward order could possibly be different from what it is, and we continually divine from the present what the future is to be. These habits of transition, from one thought to another, are features of mental structure which were lacking in us at birth; we can see their growth under experience's moulding finger, and we can see how often experience undoes her own work, and for an earlier order substitutes a new one. '*The order of experience*,' in this matter of the time- and space-conjunctions of things, is thus an indisputably *vera causa* of our forms of thought. It is our educator, our sovereign helper and friend; and its name, standing for something with so real and definite a use, ought to be kept sacred and encumbered with no vaguer meaning.

If *all* the connections among ideas in the mind could be interpreted as so many combinations of sense-data wrought into fixity in this way from without, then experience in the common and legitimate sense of the word would be the sole fashioner of the mind.

The empirical school in psychology has in the main contended that they can be so interpreted. Before our generation, it was the experience of the individual only which was meant. But when one nowadays says that the

human mind owes its present shape to experience, he means the experience of ancestors as well. Mr. Spencer's statement of this is the earliest emphatic one, and deserves quotation in full:[527]

"The supposition that the inner cohesions are adjusted to the outer persistences by *accumulated* experience of those outer persistences is in harmony with all our actual knowledge of mental phenomena. Though in so far as reflex actions and instincts are concerned, the experience-hypothesis seems insufficient; yet its seeming insufficiency occurs only where the evidence is beyond our reach. Nay, even here such few facts as we can get point to the conclusion that automatic psychical connections result from the registration of *experiences continued for numberless generations*.

"In brief, the case stands thus: It is agreed that all psychical relations, save the absolutely indissoluble, are determined by experiences. Their various strengths are admitted, other things equal, to be proportionate to the *multiplication of experiences*. It is an unavoidable corollary that an *infinity of experiences* will produce a psychical relation that is indissoluble. Though such infinity of experiences cannot be received by a single individual, yet it may be received by the succession of individuals forming a race. And if there is a transmission of induced tendencies in the nervous system, it is inferrible that *all psychical relations whatever*, from the necessary to the fortuitous, result from the experiences of the corresponding external relations; and are so brought into harmony with them.

"Thus, the experience-hypothesis furnishes an adequate solution. The genesis of instinct, the development of memory and reason out of it, and the consolidation of rational actions and inferences into instinctive ones, are alike explicable on the *single principle* that the cohesion between psychical states is proportionate to the *frequency* with which the relation between the answering external phenomena has been *repeated in experience*.

"The *universal law* that, other things equal, the cohesion of psychical states is proportionate to the *frequency* with which they have followed one another in experience, supplies an explanation of the so-called 'forms of thought,' as soon as it is supplemented by the law that

habitual psychological successions entail some hereditary tendency to such successions, which, under persistent conditions, will become cumulative in generation after generation. We saw that the establishment of those compound reflex actions called instincts is comprehensible on the principle that inner relations are, *by perpetual repetition*, organized into correspondence with outer relations. We have now to observe that the establishment of those consolidated, those indissoluble, those instinctive mental relations constituting our ideas of Space and Time is comprehensible on the same principle. For if even to external relations that are *often* experienced during the life of a single organism, answering internal relations are established that become next to automatic—if such a combination of psychological changes as that which guides a savage in hitting a bird with an arrow becomes, by constant repetition, so organized as to be performed almost without thought of the processes of adjustment gone through—and if skill of this kind is so far transmissible that particular races of men become characterized by particular aptitudes, which are nothing else than partially-organized psychological connections; then, if there exist certain external relations which are experienced by all organisms at all instants of their waking lives—relations which are absolutely constant, absolutely universal—there will be established answering internal relations that are absolutely constant, absolutely universal. Such relations we have in those of Space and Time. The organization of subjective relations adjusted to these objective relations has been cumulative, not in each race of creatures only, but throughout successive races of creatures; and such subjective relations have, therefore, become more consolidated than all others. Being experienced in every perception and every action of each creature, these connections among outer existences must, for this reason too, be responded to by connections among inner feelings, that are, above all others, indissoluble. As the substrata of all other relations in the *non-ego*, they must be responded to by conceptions that are the substrata of all other relations in the *ego*. Being the *constant and infinitely-repeated* elements of thought, they must become the automatic elements of thought—the elements of thought which it is impossible to get rid of—the 'forms of intuition.'

"Such, it seems to me, is the only possible reconciliation between the experience-hypothesis and the hypothesis of the transcendentalists; neither of which is tenable by itself. Insurmountable difficulties are presented by the Kantian doctrine (as we shall hereafter see); and the antagonist doctrine, taken alone, presents difficulties that are equally insurmountable. To rest with the unqualified assertion that, antecedent to experience, the mind is a blank, is to ignore the questions—whence comes the power of organizing experiences? whence arise the different degrees of that power possessed by different races of organisms, and different individuals of the same race? If, at birth, there exists nothing but a passive receptivity of impressions, why is not a horse as educable as a man? Should it be said that language makes the difference, then why do not the cat and the dog, reared in the same household, arrive at equal degrees and kinds of intelligence? Understood in its current form, the experience-hypothesis implies that the presence of a definitely-organized nervous system is a circumstance of no moment—a fact not needing to be taken into account! Yet it is the all-important fact—the fact to which, in one sense, the criticisms of Leibnitz and others pointed—the fact without which an assimilation of experiences is inexplicable. Throughout the animal kingdom in general, the actions are dependent on the nervous structure. The physiologist shows us that each reflex movement implies the agency of certain nerves and ganglia; that a development of complicated instincts is accompanied by complication of the nervous centres and their commissural connections; that the same creature in different stages, as larva and imago for example, changes its instincts as its nervous structure changes; and that as we advance to creatures of high intelligence, a vast increase in the size and in the complexity of the nervous system takes place. What is the obvious inference? It is that the ability to co-ordinate impressions and to perform the appropriate actions always implies the pre-existence of certain nerves arranged in a certain way. What is the meaning of the human brain? It is that the many *established* relations among its parts stand for so many *established* relations among the psychical changes. Each of the constant connections among the fibres of the cerebral masses answers to some *constant connection* of phenomena in the experiences of the race. Just as the organized arrangement subsisting between the sensory nerves of

the nostrils and the motor nerves of the respiratory muscles not only makes possible a sneeze, but also, in the newly-born infant, implies sneezings to be hereafter performed; so, all the organized arrangements subsisting among the nerves of the infant's brain not only make possible certain combinations of impressions, but also imply that such combinations will hereafter be made—imply that there are answering combinations in the outer world—imply a preparedness to cognize these combinations—imply faculties of comprehending them. It is true that the resulting compound psychical changes do not take place with the same readiness and automatic precision as the simple reflex action instanced—it is true that some individual experiences seem required to establish them. But while this is partly due to the fact that these combinations are highly involved, extremely varied in their modes of occurrence, made up therefore of psychical relations less completely coherent, and hence need further repetitions to perfect them; it is in a much greater degree due to the fact that at birth the organization of the brain is incomplete, and does not cease its spontaneous progress for twenty or thirty years afterwards. Those who contend that knowledge results wholly from the experiences of the individual, ignoring as they do the mental evolution which accompanies the autogenous development of the nervous system, fall into an error as great as if they were to ascribe all bodily growth and structure to exercise, forgetting the innate tendency to assume the adult form. Were the infant born with a full-sized and completely-constructed brain, their position would be less untenable. But, as the case stands, the gradually-increasing intelligence displayed throughout childhood and youth is more attributable to the completion of the cerebral organization than to the individual experiences—a truth proved by the fact that in adult life there is sometimes displayed a high endowment of some faculty which, during education, was never brought into play. Doubtless, experiences received by the individual furnish the concrete materials for all thought. Doubtless, the organized and semi-organized arrangements existing among the cerebral nerves can give no knowledge until there has been a presentation of the external relations to which they correspond. And doubtless the child's daily observations and reasonings aid the formation of those involved nervous connections that are in process of spontaneous evolution; just as its

daily gambols aid the development of its limbs. But saying this is quite a different thing from saying that its intelligence is wholly *produced* by its experiences. That is an utterly inadmissible doctrine—a doctrine which makes the presence of a brain meaningless—a doctrine which makes idiotcy unaccountable.

"In the sense, then, that there exist in the nervous system certain pre-established relations answering to relations in the environment, there is truth in the doctrine of 'forms of intuition'—not the truth which its defenders suppose, but a parallel truth. Corresponding to absolute external relations, there are established in the structure of the nervous system absolute internal relations—relations that are potentially present before birth in the shape of definite nervous connections; that are antecedent to, and independent of, individual experiences; and that are automatically disclosed along with the first cognitions. And, as here understood, it is not only these fundamental relations which are thus predetermined, but also hosts of other relations of a more or less constant kind, which are congenitally represented by more or less complete nervous connections. But these predetermined internal relations, though independent of the experiences of the individual, are not independent of experiences in general: they have been determined by the experiences of preceding organisms. The corollary here drawn from the general argument is that the human brain is an organized register of *infinitely-numerous* experiences received during the evolution of life, or rather during the evolution of that series of organisms through which the human organism has been reached. The effects of the most *uniform and frequent* of these experiences have been successively bequeathed, principal and interest; and have slowly amounted to that high intelligence which lies latent in the brain of the infant—which the infant in after-life exercises and perhaps strengthens or further complicates—and which, with minute additions, it bequeaths to future generations. And thus it happens that the European inherits from twenty to thirty cubic inches more brain than the Papuan. Thus it happens that faculties, as of music, which scarcely exist in some inferior human races, become congenital in superior ones. Thus it happens that out of savages unable to count up to the number of their fingers, and speaking a language containing only nouns and verbs, arise at length our Newtons and Shakspeares."

This is a brilliant and seductive statement, and it doubtless includes a good deal of truth. Unfortunately it fails to go into details; and when the details are scrutinized, as they soon must be by us, many of them will be seen to be inexplicable in this simple way, and the choice will then remain to us either of denying the experiential origin of certain of our judgments, or of enlarging the meaning of the word experience so as to include these cases among its effects.

TWO MODES OF ORIGIN OF BRAIN STRUCTURE.

If we adopt the former course we meet with a controversial difficulty. The 'experience-philosophy' has from time immemorial been the opponent of theological modes of thought. The word experience has a halo of anti-supernaturalism about it; so that if anyone express dissatisfaction with any function claimed for it, he is liable to be treated as if he could only be animated by loyalty to the catechism, or in some way have the interests of obscurantism at heart. I am entirely certain that, on this ground alone, what I have erelong to say will make this a sealed chapter to many of my readers. "He denies experience!" they will exclaim, "denies science; believes the mind created by miracle; is a regular old partisan of innate ideas! That is enough! we'll listen to such antediluvian twaddle no more." Regrettable as is the loss of readers capable of such wholesale discipleship, I feel that a definite meaning for the word experience is even more important than their company. 'Experience' does not mean every natural, as opposed to every supernatural, cause. It means a particular sort of natural agency, alongside of which other more recondite natural agencies may perfectly well exist. With the scientific animus of anti-supernaturalism we ought to agree, but we ought to free ourselves from its verbal idols and bugbears.

Nature has many methods of producing the same effect. She may make a 'born' draughtsman or singer by tipping in a certain direction at an opportune moment the molecules of some human ovum; or she may bring forth a child ungifted and make him spend laborious but successful years at school. She may make our ears ring by the sound of a bell, or by a dose of

quinine; make us see yellow by spreading a field of buttercups before our eyes, or by mixing a little santonine powder with our food; fill us with terror of certain surroundings by making them really dangerous, or by a blow which produces a pathological alteration of our brain. It is obvious that we need two words to designate these two modes of operating. *In the one case the natural agents produce perceptions which take cognizance of the agents themselves; in the other case, they produce perceptions which take cognizance of something else.* What is taught to the mind by the 'experience,' in the first case, is the *order of the experience itself*—the 'inner relation' (in Spencer's phrase) 'corresponds' to the 'outer relation' which produced it, by remembering and knowing the latter. But in the case of the *other* sort of natural agency, what is taught to the mind has nothing to do with the agency itself, but with some different outer relation altogether. A diagram will express the alternatives. B stands for our human brain in the midst of the world. All the little *o*'s with arrows proceeding from them are natural objects (like sunsets, etc.), which impress it through the senses, and in the strict sense of the word give it *experience*, teaching it by habit and association what is the order of their ways. All the little *x*'s inside the brain and all the little *x*'s outside of it are other natural objects and processes (in the ovum, in the blood, etc.), which equally modify the brain, but mould it to no cognition of *themselves*. The *tinnitus aurium* discloses no properties of the quinine; the musical endowment teaches no embryology; the morbid dread (of solitude, perhaps) no brain-pathology; but the way in which a dirty sunset and a rainy morrow hang together in the mind copies and teaches the sequences of sunsets and rainfall in the outer world.

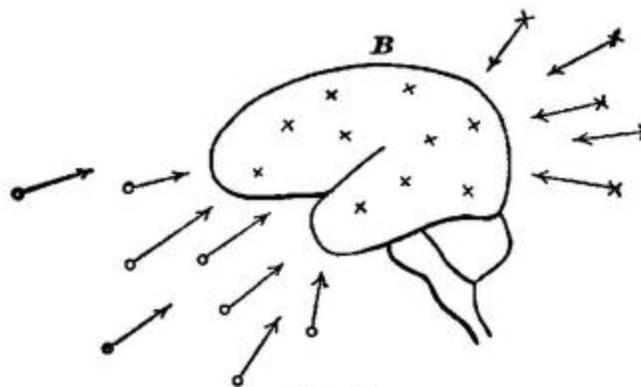


FIG. 94.

In zoological evolution we have two modes in which an animal race may grow to be a better match for its environment.

First, the so-called way of 'adaptation,' in which the environment may itself modify its inhabitant by exercising, hardening, and habituating him to certain sequences, and these habits may, it is often maintained, become hereditary.

Second, the way of 'accidental variation,' as Mr. Darwin termed it, in which certain young are born with peculiarities that help them and their progeny to survive. That variations of *this* sort tend to become hereditary, no one doubts.

The first mode is called by Mr. Spencer direct, the second indirect, equilibration. Both equilibrations must of course be natural and physical processes, but they belong to entirely different physical spheres. The direct influences are obvious and accessible things. The causes of variation in the young are, on the other hand, molecular and hidden. The direct influences are the animal's 'experiences,' in the widest sense of the term. Where what is influenced by them is the *mental* organism, they are *conscious* experiences, and become the *objects* as well as the causes of their effects. That is, the effect consists in a tendency of the experience itself to be remembered, or to have its elements thereafter coupled in imagination just as they were coupled in the experience. In the diagram these experiences are represented by the *o*'s exclusively. The *x*'s, on the other hand, stand for the indirect causes of mental modification—causes of which we are not immediately conscious as such, and which are not the direct *objects* of the effects they produce. Some of them are molecular accidents before birth; some of them are collateral and remote combinations, unintended combinations, one might say, of more direct effects wrought in the unstable and intricate brain-tissue. Such a result is unquestionably the susceptibility to music, which some individuals possess at the present day. It has no zoological utility; it corresponds to no object in the natural environment; it is a pure *incident* of having a hearing organ, an incident depending on such instable and inessential conditions that one brother may have it and another brother not. Just so with the susceptibility to sea-sickness, which, so far from being engendered by long experience of its 'object' (if a heaving deck can be called its object) is ere long annulled thereby. Our higher æsthetic, moral, and intellectual life seems made up of affections of this collateral and

incidental sort, which have entered the mind by the back stairs, as it were, or rather have not entered the mind at all, but got surreptitiously born in the house. No one can successfully treat of psychogenesis, or the factors of mental evolution, without distinguishing between these two ways in which the mind is assailed. The way of 'experience' proper is the front door, the door of the five senses. The agents which affect the brain in this way immediately become the mind's *objects*. The other agents do not. It would be simply silly to say of two men with perhaps equal effective skill in drawing, one an untaught natural genius, the other a mere obstinate plodder in the studio, that both alike owe their skill to their 'experience.' The reasons of their several skills lie in wholly disparate natural cycles of causation.^[528]

I will then, with the reader's permission, restrict the word 'experience' to processes which influence the mind by the front-door-way of simple habits and association. What the back-door-effects may be will probably grow clearer as we proceed; so I will pass right on to a scrutiny of the actual mental structure which we find.

THE GENESIS OF THE ELEMENTARY MENTAL CATEGORIES.

- We find:
1. Elementary sorts of sensation, and feelings of personal activity;
 2. Emotions; desires; instincts; ideas of worth; æsthetic ideas;
 3. Ideas of time and space and number;
 4. Ideas of difference and resemblance, and of their degrees.
 5. Ideas of causal dependence among events; of end and means; of subject and attribute.
 6. Judgments affirming, denying, doubting, supposing any of the above ideas.
 7. Judgments that the former judgments logically involve, exclude, or are indifferent to, each other.

Now we may postulate at the outset that all these forms of thought have a *natural* origin, if we could only get at it. That assumption must be made at the outset of every scientific investigation, or there is no temptation to proceed. But the first account of their origin which we are likely to hit upon

is a snare. All these mental affections are ways of knowing objects. Most psychologists nowadays believe that the objects first, in some natural way, engendered a brain from out of their midst, and then imprinted these various cognitive affections upon it. But how? The ordinary evolutionist answer to this question is exceedingly simple-minded. The idea of most speculators seems to be that, since it suffices *now* for us to become acquainted with a complex object, that it should be simply *present* to us often enough, so it must be fair to assume universally that, with time enough given, the *mere presence* of the various objects and relations to be known must end by bringing about the latter's cognition, and that in this way all mental structure was from first to last evolved. Any ordinary Spencerite will tell you that just as the experience of blue objects wrought into our mind the color blue, and hard objects got it to feel hardness, so the presence of large and small objects in the world gave it the notion of size, moving objects made it aware of motion, and objective successions taught it time. Similarly in a world with different impressing things, the mind had to acquire a sense of difference, whilst the like parts of the world as they fell upon it kindled in it the perception of similarity. Outward sequences which sometimes held good, and sometimes failed, naturally engendered in it doubtful and uncertain forms of expectation, and ultimately gave rise to the disjunctive forms of judgment; whilst the hypothetic form, 'if *a*, then *b*,' was sure to ensue from sequences that were invariable in the outer world. On this view, if the outer order suddenly were to change its elements and modes, we should have no faculties to cognize the new order by. At most we should feel a sort of frustration and confusion. But little by little the new presence would work on us as the old one did; and in course of time another set of psychic categories would arise, fitted to take cognizance of the altered world.

This notion of the outer world inevitably building up a sort of mental duplicate of itself if we only give it time, is so easy and natural in its vagueness that one hardly knows how to start to criticise it. One thing, however, is obvious, namely that *the manner in which we now become acquainted with complex objects need not in the least resemble the manner in which the original elements of our consciousness grew up*. Now, it is true, a new sort of animal need only be present to me, to impress its image permanently on my mind; but this is because I am already in possession of categories for knowing each and all of its several attributes, and of a

memory for retracing the order of their conjunction. I now have preformed categories for all possible objects. The objects need only awaken these from their slumber. But it is a very different matter to account for the categories themselves. I think we must admit that the origin of the various elementary feelings is a recondite history, even after some sort of neural tissue is there for the outer world to begin its work on. The mere existence of things to be known is even now not, as a rule, sufficient to bring about a knowledge of them. Our abstract and general discoveries usually come to us as lucky fancies: and it is only *après coup* that we find that they correspond to some reality. What immediately produced them were previous thoughts, with which, and with the brain-processes of which, that reality had naught to do.

Why may it not have been so of the original elements of consciousness, sensation, time, space, resemblance, difference, and other relations? Why may they not have come into being by the back-door method, by such physical processes as lie more in the sphere of morphological accident, of inward summation of effects, than in that of the 'sensible presence' of objects? Why may they not, in short, be pure *idiosyncrasies*, spontaneous variations, fitted by good luck (those of them which have survived) to take cognizance of objects (that is, to steer us in our active dealings with them), without being in any intelligible sense immediate derivatives from them? I think we shall find this view gain more and more plausibility as we proceed.^[529]

All these elements are subjective duplicates of outer objects. They *are* not the outer objects. The secondary qualities among them are not supposed by any educated person even to resemble the objects. Their *nature* depends more on the reacting brain than on the stimuli which touch it off. This is even more palpably true of the natures of pleasure and pain, effort, desire and aversion, and of such feelings as those of cause and substance, of denial and of doubt. Here then is a native wealth of inner forms whose origin is shrouded in mystery, and which at any rate were not simply 'impressed' from without, in any intelligible sense of the verb 'to impress.'

Their *time- and space-relations*, however, *are* impressed from without—for two outer things at least the evolutionary psychologist must believe to resemble our thoughts of them, these are the time and space in which the objects lie. *The time- and space-relations between things do stamp copies of themselves within.* Things juxtaposed in space impress us, continue to be thought of *as* thus juxtaposed. Things sequent in time impress their sequence on our memory. And thus, through experience in the legitimate sense of the word there can be truly explained an immense number of our mental habitudes, many of our abstract beliefs, and all our ideas of concrete things, and of their ways of behavior. Such truths as that fire burns and water wets, that glass refracts, heat melts snow, fishes live in water and die on land, and the like, form no small part of the most refined education, and are the all-in-all of education amongst the brutes and lowest men. Here the mind is passive and tributary, a servile copy, fatally and unresistingly fashioned from without. It is the merit of the associationist school to have seen the wide scope of these effects of neighborhood in time and space; and their exaggerated applications of the principle of mere neighborhood ought not to blind us to the excellent service it has done to Psychology in their hands. As far as a large part of our thinking goes, then, it can intelligibly be formulated as a mere lot of *habits* impressed upon us from without. The degree of cohesion of our inner relations, is, in this part of our thinking, proportionate, in Mr. Spencer's phrase, to the degree of cohesion of the outer relations; the causes and the objects of our thought are one; and we are, in so far forth, what the materialistic evolutionists would have us altogether, mere offshoots and creatures of our environment, and naught besides. ^[530]

But now the plot thickens, for the images impressed upon our memory by the outer stimuli are not restricted to the mere time- and space-relations, in which they originally came, but revive in various manners (dependent on the intricacy of the brain-paths and the instability of the tissue thereof), and form secondary combinations such as the *forms of judgment*, which, taken *per se*, are not congruent either with the forms in which reality exists or in those in which experiences befall us, but which may nevertheless be explained by the way in which experiences befall in a mind gifted with memory, expectation, and the possibility of feeling doubt, curiosity, belief, and denial. The conjunctions of experience befall more or less invariably, variably, or never. The idea of one term will then engender a fixed, a

wavering, or a negative expectation of another, giving affirmative, the hypothetical, disjunctive, interrogative, and negative judgments, and judgments of actuality and possibility about certain things. The separation of attribute from subject in all judgments (which violates the way in which nature exists) may be similarly explained by the piecemeal order in which our perceptions come to us, a vague nucleus growing gradually more detailed as we attend to it more and more. These particular secondary mental forms have had ample justice done them by associationists from Hume downwards.

Associationists have also sought to account for discrimination, abstraction, and generalization by the rates of frequency in which attributes come to us conjoined. With much less success, I think. In the chapter on Discrimination, I have, under the "law of dissociation by varying concomitants," sought to explain as much as possible by the passive order of experience. But the reader saw how much was left for active interest and unknown forces to do. In the chapter on Imagination I have similarly striven to do justice to the 'blended image' theory of generalization and abstraction. So I need say no more of these matters here.

THE GENESIS OF THE NATURAL SCIENCES.

Our 'scientific' ways of thinking the outer reality are highly abstract ways. The essence of things for science is not to be what they seem, but to be atoms and molecules moving to and from each other according to strange laws. Nowhere does the account of inner relations produced by outer ones in proportion to the frequency with which the latter have been met, more egregiously break down than in the case of scientific conceptions. The order of scientific thought is quite incongruent either with the way in which reality exists or with the way in which it comes before us. Scientific thought goes by selection and emphasis exclusively. We break the solid plenitude of fact into separate essences, conceive generally what only exists particularly, and by our classifications leave nothing in its natural neighborhood, but separate the contiguous, and join what the poles divorce. The reality *exists* as a *plenum*. All its parts are contemporaneous, each is as real as any other, and each as essential for making the whole just what it is and nothing else. But we can neither experience nor think this *plenum*. What we experience,

what *comes before us*, is a chaos of fragmentary impressions interrupting each other;^[531] what we *think* is an abstract system of hypothetical data and laws.^[532]

This sort of scientific algebra, little as it immediately resembles the reality given to us, turns out (strangely enough) applicable to it. That is, it yields expressions which, at given places and times, can be translated into real values, or interpreted as definite portions of the chaos that falls upon our sense. It becomes thus a practical guide to our expectations as well as a theoretic delight. But I do not see how any one with a sense for the facts can possibly call our systems immediate results of 'experience' in the ordinary sense. Every scientific conception is in the first instance a 'spontaneous variation' in some one's brain.^[533] For one that proves useful and applicable there are a thousand that perish through their worthlessness. Their genesis is strictly akin to that of the flashes of poetry and sallies of wit to which the instable brain-paths equally give rise. But whereas the poetry and wit (like the science of the ancients) are their 'own excuse for being,' and have to run the gauntlet of no farther test, the 'scientific' conceptions must prove their worth by being 'verified.' This test, however, is the cause of their *preservation*, not that of their production; and one might as well account for the origin of Artemus Ward's jokes by the 'cohesion' of subjects with predicates in proportion to the 'persistence of the outer relations' to which they 'correspond' as to treat the genesis of scientific conceptions in the same ponderously unreal way.

The most persistent outer relations which science believes in are never matters of experience at all, but have to be disengaged from under experience by a process of elimination, that is, by ignoring conditions which are always present. The *elementary* laws of mechanics, physics, and chemistry are all of this sort. The principle of uniformity in nature is of this sort; it has to be *sought* under and in spite of the most rebellious appearances; and our conviction of its truth is far more like a religious faith than like assent to a demonstration. The only cohesions which experience in the literal sense of the word produces in our mind are, as we contended some time back, the proximate laws of nature, and habitudes of concrete things, that heat melts ice, that salt preserves meat, that fish die out of water, and the like.^[534] Such 'empirical truths' as these we admitted to form an enormous part of human wisdom. The 'scientific' truths have to

harmonize with these truths, or be given up as useless; but they arise in the mind in no such passive associative way as that in which the simpler truths arise. Even those experiences which are used to prove a scientific truth are for the most part artificial experiences of the laboratory gained after the truth itself has been conjectured. Instead of experiences engendering the 'inner relations,' the inner relations are what engender the experiences here.

What happens in the brain after experience has done its utmost is what happens in every material mass which has been fashioned by an outward force,—in every pudding or mortar, for example, which I may make with my hands. The fashioning from without brings the elements into collocations which set new internal forces free to exert their effects in turn. And the random irradiations and resettlements of our ideas, which *supervene upon experience*, and constitute our free mental play, are due entirely to these secondary internal processes, which vary enormously from brain to brain, even though the brains be exposed to exactly the same 'outer relations.' The higher thought-processes owe their being to causes which correspond far more to the sourings and fermentations of dough, the setting of mortar, or the subsidence of sediments in mixtures, than to the manipulations by which these physical aggregates came to be compounded. Our study of similar association and reasoning taught us that the whole superiority of man depended on the facility with which in his brain the paths worn by the most frequent outer cohesions could be ruptured. The causes of the instability, the reasons why now this point and now that become in him the seat of rupture, we saw to be entirely obscure. (Vol. I. p. 580; Vol. II. [p. 364](#).) The only clear thing about the peculiarity seems to be its interstitial character, and the certainty that no mere appeal to man's 'experience' suffices to explain it.

When we pass from scientific to æsthetic and ethical systems, every one readily admits that, although the elements are matters of experience, the peculiar forms of relation into which they are woven are incongruent with the order of passively received experience. The world of æsthetics and ethics is an ideal world, a Utopia, a world which the outer relations persist in contradicting, but which we as stubbornly persist in striving to make actual. Why do we thus invincibly crave to alter the given order of nature? Simply because other relations among things are far more interesting to us and more charming than the mere rates of frequency of their time- and

space-conjunctions. These other relations are all secondary and brain-born, 'spontaneous variations' most of them, of our sensibility, whereby certain elements of experience, and certain arrangements in time and space, have acquired an agreeableness which otherwise would not have been felt. It is true that habitual arrangements may also become agreeable. But this agreeableness of the merely habitual is felt to be a mere ape and counterfeit of real inward fitness; and one sign of intelligence is never to mistake the one for the other.

There are then ideal and inward relations amongst the objects of our thought which can in no intelligible sense whatever be interpreted as reproductions of the order of outer experience. In the æsthetic and ethical realms they conflict with its order—the early Christian with his kingdom of heaven, and the contemporary anarchist with his abstract dream of justice, will tell you that the existing order must perish, root and branch, ere the true order can come. Now the peculiarity of those relations among the objects of our thought which are dubbed 'scientific' is this, that although they no more are inward *reproductions* of the outer order than the ethical and æsthetic relations are, yet they do not conflict with that order, but, once having sprung up by the play of the inward forces, are found—some of them at least, namely the only ones which have survived long enough to be matters of record—to be *congruent* with the time- and space-relations which our impressions affect.

In other words, though nature's materials lend themselves slowly and discouragingly to our translation of them into ethical forms, but more readily into æsthetic forms; to translation into scientific forms they lend themselves with relative ease and completeness. The translation, it is true, will probably never be ended. The perceptive order does not give way, nor the right conceptive substitute for it arise, at our bare word of command. [535] It is often a deadly fight; and many a man of science can say, like Johannes Müller, after an investigation, '*Es klebt Blut an der Arbeit.*' But victory after victory makes us sure that the essential doom of our enemy is defeat. [536]

THE GENESIS OF THE PURE SCIENCES.

I have now stated in general terms the relation of the natural sciences to experience strictly so called, and shall complete what I have to say by reverting to the subject on a later page. At present I will pass to the so-called *pure* or *a priori sciences* of Classification, Logic, and Mathematics. My thesis concerning these is that they are even less than the natural sciences effects of the order of the world as it comes to our experience. THE PURE SCIENCES EXPRESS RESULTS OF COMPARISON *exclusively*; *comparison is not a conceivable effect of the order in which outer impressions are experienced—it is one of the house-born (p. 627) portions of our mental structure; therefore the pure sciences form a body of propositions with whose genesis experience has nothing to do.*

First, consider the nature of comparison. *The relations of resemblance and difference among things have nothing to do with the time- and space-order in which we may experience the latter.* Suppose a hundred beings created by God and gifted with the faculties of memory and comparison. Suppose that upon each of them the same lot of sensations are imprinted, but in different orders. Let some of them have no single sensation more than once. Let some have this one and others that one repeated. Let every conceivable permutation prevail. And then let the magic-lantern show die out, and keep the creatures in a void eternity, with naught but their memories to muse upon. Inevitably in their long leisure they will begin to play with the items of their experience and rearrange them, make classificatory series of them, place gray between white and black, orange between red and yellow, and trace all other degrees of resemblance and difference. And this new construction will be absolutely identical in all the hundred creatures, the diversity of the sequence of the original experiences having no effect as regards this rearrangement. Any and every form of sequence will give the same result, because the result expresses the relation between the *inward natures* of the sensations; and to that the question of their outward succession is quite irrelevant. Black will differ from white just as much in a world in which they always come close together as in one in which they always come far apart; just as much in one in which they appear rarely as in one in which they appear all the time.

But the advocate of 'persistent outer relations' may still return to the charge: These *are* what make us so sure that white and black differ, he may say; for in a world where sometimes black resembled white and sometimes differed from it, we could never be so sure. It is because in this world black and white have *always* differed that the sense of their difference has become a necessary form of thought. The pair of colors on the one hand and the sense of difference on the other, inseparably experienced, not only by ourselves but by our ancestors, have become inseparably connected in the mind. Not through any essential structure of the mind, which made difference the only possible feeling which they could arouse; no, but because they simply *did* differ so often that at last they begat in us an impotency to imagine them doing anything else, and made us accept such a fabulous account as that just presented, of creatures to whom a single experience would suffice to make us feel the necessity of this relation.

I know not whether Mr. Spencer would subscribe to this or not;—nor do I care, for there are mysteries which press more for solution than the meaning of this vague writer's words. But to me such an explanation of our difference-judgment is absolutely unintelligible. We now find black and white different, the explanation says, *because we have always have so found them*. But why should we always have so found them? Why should difference have popped into our heads so invariably with the thought of them? There must have been either a subjective or an objective reason. The subjective reason can only be that our minds were so constructed that a sense of difference was the only sort of conscious transition possible between black and white; the objective reason can only be that difference was always there, with these colors, outside the mind as an objective fact. The subjective reason explains outer frequency by inward structure, not inward structure by outer frequency; and so surrenders the experience-theory. The objective reason simply says that if an outer difference is there the mind must needs know it—which is no explanation at all, but a mere appeal to the fact that somehow the mind does know what is there.

The only clear thing to do is to give up the sham of a pretended explanation, and to fall back on the fact that the sense of difference *has* arisen, in some natural manner doubtless, but in a manner which we do not understand. It

was by the back-stairs way, at all events; and, from the very first, happened to be the only mode of reaction by which consciousness could feel the transition from one term to another of what (in *consequence* of this very reaction) we now call a contrasted pair.

In noticing the differences and resemblances of things, and their degrees, the mind feels its own activity, and has given the name of *comparison* thereto. It need not compare its materials, but if once roused to do so, it can compare them with but one result, and this a fixed consequence of the nature of the materials themselves. Difference and resemblance are thus relations between ideal objects, or conceptions as such. To learn whether black and white differ, I need not consult the world of experience at all; the mere ideas suffice. *What I mean* by black differs from *what I mean* by white, whether such colors exist *extra mentem meam* or not. If they ever do so exist, they *will* differ. White things may blacken, but the black of them will differ from the white of them, so long as I mean anything definite by these three words.^[537]

I shall now in what follows call all propositions which express time- and space-relations empirical propositions; and I shall give the name of rational propositions to all propositions which express the results of a comparison. The latter denomination is in a sense arbitrary, for resemblance and difference are not usually held to be the only rational relations between things. I will next proceed to show, however, how many other rational relations commonly supposed distinct can be resolved into these, so that my definition of rational propositions will end, I trust, by proving less arbitrary than it now appears to be.

SERIES OF EVEN DIFFERENCE AND MEDIATE COMPARISON.

In Chapter XII we saw that the mind can at successive moments *mean the same*, and that it gradually comes into possession of a stock of permanent and fixed meanings, ideal objects, or conceptions, some of which are universal qualities, like the black and white of our example, and some, individual things. We now see that not only are the objects permanent mental possessions, but the results of their comparison are permanent too. The objects and their differences together form an immutable system. *The same objects, compared in the same way, always give the same results*; if the result be not the same, then the objects are not those originally meant.

This last principle, which we may call the *axiom of constant result*, holds good throughout all our mental operations, not only when we compare, but when we add, divide, class, or infer a given matter in any conceivable way. Its most general expression would be "*the Same operated on in the same way gives the Same.*" In mathematics it takes the form of "equals added to, or subtracted from, equals give equals," and the like. We shall meet with it again.

The next thing which we observe is that *the operation of comparing may be repeated on its own results*; in other words, that we can think of the various resemblances and differences which we find and compare them with each other, making differences and resemblances of a higher order. *The mind thus becomes aware of sets of similar differences, and forms series of terms with the same kind and amount of difference between them, terms which, as they succeed each other, maintain a constant direction of serial increase.* This sense of constant direction in a series of operations we saw in Chapter XIII (p. 490) to be a cardinal mental fact. "A differs from B differs from C differs from D, etc.," makes a *series* only when the differences are in the same direction. In any such difference-series all terms differ in just the same way from their predecessors. The numbers 1, 2, 3, 4, 5,... the notes of the chromatic scale in music, are familiar examples. As soon as the mind grasps such a series as a whole, it perceives that *two terms taken far apart differ more than two terms taken near together*, and that any one term differs more from a remote than from a near successor, and this no matter what the terms may be, or what the sort of difference may be, provided it is always the same sort.

This PRINCIPLE OF MEDIATE COMPARISON might be briefly (though obscurely) expressed by the formula "*more than the more is more than the less*"—the words *more* and *less* standing simply for degrees of increase along a constant direction of differences. Such a formula would cover all possible cases, as, earlier than early is earlier than late, worse than bad is worse than good, east of east is east of west; etc., etc., *ad libitum*.^[538] Symbolically, we might write it as $a < b < c < d...$ and say that any number of intermediaries may be expunged without obliging us to alter anything in what remains written.

The principle of mediate comparison is only one form of a law which holds in many series of homogeneously related terms, the law that *skipping intermediary terms leaves relations the same*. This AXIOM OF SKIPPED INTERMEDIARIES OR OF TRANSFERRED RELATIONS occurs, as we soon shall see, in logic as the fundamental principle of inference, in arithmetic as the fundamental property of the number-series, in geometry as that of the straight line, the plane and the parallel. *It seems to be on the whole the broadest and deepest law of man's thought*.

In certain lists of terms the result of comparison may be to find no-difference, or equality in place of difference. Here also intermediaries may be skipped, and mediate comparison be carried on with the general result expressed by the *axiom of mediate equality*, "equals of equals are equal," which is the great principle of the mathematical sciences. This too as a result of the mind's mere acuteness, and in utter independence of the order in which experiences come associated together. Symbolically, again: $a = b = c = d...$, with the same consequence as regards expunging terms which we saw before.

CLASSIFICATORY SERIES.

Thus we have a rather intricate system of necessary and immutable *ideal truths of comparison*, a system applicable to terms *experienced* in any order of sequence or frequency, or even to terms never experienced or to be experienced, such as the mind's imaginary constructions would be. These truths of comparison result in *Classifications*. It is, for some unknown reason, a great æsthetic delight for the mind to break the order of

experience, and class its materials in serial orders, proceeding from step to step of difference, and to contemplate untiringly the crossings and inosculation of the series among themselves. The first steps in most of the sciences are purely classificatory. Where facts fall easily into rich and intricate series (as plants and animals and chemical compounds do), the mere sight of the series fills the mind with a satisfaction *sui generis*; and a world whose *real* materials naturally lend themselves to serial classification is *pro tanto* a more rational world, a world with which the mind will feel more intimate, than with a world in which they do not. By the pre-revolutionary naturalists, whose generation has hardly passed away, classifications were supposed to be ultimate insights into God's mind, filling us with adoration of his ways. The fact that Nature lets us make them was a proof of the presence of his Thought in her bosom. So far as the facts of experience can *not* be serially classified, therefore, so far experience fails to be rational in *one* of the ways, at least, which we crave.

THE LOGIC-SERIES.

Closely akin to the function of comparison is that of *judging, predicating, or subsuming*. In fact, these elementary intellectual functions run into each other so, that it is often only a question of practical convenience whether we shall call a given mental operation by the name of one or of the other. Comparisons result in groups of like things; and presently (through discrimination and abstraction) in conceptions of the *respects* in which the likenesses obtain. The groups are *genera* or *classes*, the respects are *characters* or *attributes*. The attributes again may be compared, forming genera of higher orders, and their characters singled out; so that we have a new sort of series, *that of predication, or of kind including kind*. Thus horses are quadrupeds, quadrupeds animals, animals machines, machines liable to wear out, etc. In such a series as this the several couplings of terms may have been made out originally at widely different times and under different circumstances. But memory may bring them together afterwards; and whenever it does so, our faculty of apprehending serial increase makes us conscious of them as a single system of successive terms united by the same relation.^[539]

Now whenever we become thus conscious, we may become aware of an additional relation which is of the highest intellectual importance, inasmuch as upon it the whole structure of logic is reared. *The principle of mediate predication or subsumption* is only the axiom of skipped intermediaries applied to a series of successive predications. It expresses the fact that any earlier term in the series stands to any later term in the same relation in which it stands to any intermediate term; in other words, that *whatever has an attribute has all the attributes of that attribute*; or more briefly still, that *whatever is of a kind is of that kind's kind*. A little explanation of this statement will bring out all that it involves.

We learned in the chapter on Reasoning what our great motive is for abstracting attributes and predicating them. It is that our varying practical purposes require us to lay hold of different angles of the reality at different times. But for these we should be satisfied to 'see it whole,' and always alike. The purpose, however, makes one aspect essential; so, to avoid dispersion of the attention, we treat the reality as if for the time being it were nothing but that aspect, and we let its supernumerary determinations go. In short, we substitute the aspect for the whole real thing. *For our purpose* the aspect *can* be substituted for the whole, and the two treated as the same; and the word *is* (which couples the whole with its aspect or attribute in the categoric judgment) expresses (among other things) the identifying operation performed. The predication-series *a is b, b is c, c is d,...* closely resembles for certain practical purposes the equation-series *a = b, b = c, c = d, etc.*

But what is our purpose in predicating? Ultimately, it may be anything we please; but proximately and immediately, it is always the gratification of a certain curiosity as to whether the object in hand is or is not *of a kind* connected with that ultimate purpose. Usually the connection is not obvious, and we only find that the object S is of a kind connected with P, after first finding that it is of a kind M, which itself is connected with P. Thus, to fix our ideas by an example, we have a curiosity (our ultimate purpose being conquest over nature) as to how Sirius may move. It is not obvious whether Sirius is a kind of thing which moves in the line of sight or not. When, however, we find it to be a kind of thing in whose spectrum the hydrogen-line is shifted, and when we reflect that *that* kind of thing is a kind of thing which moves in the line of sight; we conclude that Sirius does

so move. Whatever Sirius's attribute is, Sirius is; its adjective's adjective can supersede its own adjective in our thinking, and this with no loss to our knowledge, *so long as we stick to the definite purpose in view.*

Now please note that this elimination of intermediary kinds and transfer of *is's* along the line, results from our insight into the very meaning of the word *is*, and into the constitution of any series of terms connected by that relation. It has naught to do with what any particular thing is or is not; but, *whatever* any given thing may be, we see that it also is whatever *that* is, indefinitely. To grasp in one view a succession of *is's* is to apprehend this relation between the terms which they connect; just as to grasp a list of successive equals is to apprehend their *mutual* equality throughout. The principle of mediate subsumption thus expresses relations of ideal objects as such. It can be discovered by a mind left at leisure with any set of meanings (however originally obtained), of which some are predicable of others. The moment we string them in a serial line, that moment we see that we can drop intermediaries, treat remote terms just like near ones, and put a genus in the place of a species. This shows that *the principle of mediate subsumption has nothing to do with the particular order of our experiences, or with the outer coexistences and sequences of terms.* Were it a mere outgrowth of habit and association, we should be forced to regard it as having no universal validity; for every hour of the day we meet things which we consider to be of this kind or of that, but later learn that they have none of the kind's properties, that they *do not* belong to the kind's kind. Instead, however, of correcting the principle by these cases, we correct the cases by the principle. We say that if the thing we named an M has not M's properties, then we were either mistaken in calling it an M, or mistaken about M's properties; or else that it is no longer M, but has changed. But we never say that it is an M without M's properties; for by conceiving a thing as of the kind M I mean that it *shall* have M's properties, be of M's kind, even though I should never be able to find in the real world anything which is an M. The principle emanates from my perception of what a lot of successive *is's mean*. This perception can no more be confirmed by one set, or weakened by another set, of outer facts, than the perception that black is not white can be confirmed by the fact that snow never blackens, or weakened by the fact that photographer's paper blackens as soon as you lay it in the sun.

The abstract scheme of successive predications, extended indefinitely, with all the possibilities of substitution which it involves, is thus an immutable system of truth which flows from the very structure and form of our thinking. *If* any real terms ever do fit into such a scheme, they will obey its laws; *whether* they do is a question as to nature's facts, the answer to which can only be empirically ascertained. *Formal logic* is the name of the Science which traces in skeleton form all the remote relations of terms connected by successive *is*'s with each other, and enumerates their possibilities of mutual substitution. To our principle of mediate subsumption she has given various formulations, of which the best is perhaps this broad expression, that *the same can be substituted for the same in any mental operation.* [540]

The ordinary logical series contains but three terms—"Socrates, man, mortal." But we also have 'Sorites'—Socrates, man, animal, machine, run down, mortal, etc.—and it violates psychology to represent these as syllogisms with terms suppressed. The ground of there being any logic at all is our power to grasp any series as a whole, and the more terms it holds the better. This synthetic consciousness of an uniform direction of advance through a multiplicity of terms is, apparently, what the brutes and lower men cannot accomplish, and what gives to us our extraordinary power of ratiocinative thought. The mind which can grasp a string of *is*'s as a whole—the objects linked by them may be ideal or real, physical, mental, or symbolic, indifferently—can also apply to it the principle of skipped intermediaries. *The logic-list is thus in its origin and essential nature just like those graded classificatory lists which we erewhile described.* The 'rational proposition' which lies at the basis of all reasoning, the *dictum de omni et nullo* in all the various forms in which it may be expressed, the fundamental law of thought, is thus *only the result of the function of comparison* in a mind which has come by some lucky variation to apprehend a series of more than two terms at once. [541] So far, then, *both Systematic Classification and Logic are seen to be incidental results of the mere capacity for discerning difference and likeness*, which capacity is a thing with which the *order of experience*, properly so styled, has absolutely nothing to do.

But how comes it (it may next be asked) when systematic classifications have so little ultimate theoretic importance—for the conceiving of things according to their mere degrees of resemblance always yields to other modes of conceiving when these can be obtained—that the logical relations among things should form such a mighty engine for dealing with the facts of life?

Chapter XXII already gave the reason (see [p. 335](#), above). This world *might* be a world in which all things differed, and in which what properties there were were ultimate and had no farther predicates. In such a world there would be as many kinds as there were separate things. We could never subsume a new thing under an old kind; or if we could, no consequences would follow. Or, again, this might be a world in which innumerable things were of a kind, but in which no concrete thing remained of the same kind long, but all objects were in a flux. Here again, though we could subsume and infer, our logic would be of no practical use to us, for the subjects of our propositions would have changed whilst we were talking. In such worlds, logical relations would obtain, and be known (doubtless) as they are now, but they would form a merely theoretic scheme and be of no use for the conduct of life. But our world is no such world. It is a very peculiar world, and plays right into logic's hands. *Some* of the things, at least, which it contains are of the same kind as other things; *some* of them remain always of the kind of which they once were; and some of the properties of them cohere indissolubly and are always found together. *Which* things these latter things are we learn by experience in the strict sense of the word, and the results of the experience are embodied in 'empirical propositions.' Whenever such a thing is met with by us now, our sagacity notes it to be of a certain kind; our learning immediately recalls that kind's kind, and then *that* kind's kind, and so on; so that a moment's thinking may make us aware that the thing is of a kind so remote that we could never have directly perceived the connection. The flight to this last kind *over the heads of the intermediaries* is the essential feature of the intellectual operation here. Evidently it is a pure outcome of our sense for apprehending serial increase; and, unlike the several propositions themselves which make up the series (and which may all be empirical), it has nothing to do with the time- and space-order in which the things have been experienced.

MATHEMATICAL RELATIONS.

So much for the *a priori* necessities called systematic classification and logical inference. The other couplings of data which pass for *a priori* necessities of thought are the *mathematical* judgments, and certain metaphysical propositions. These latter we shall consider farther on. As regards the mathematical judgments, they are all 'rational propositions' in the sense defined on [p. 644](#), for they express results of comparison and nothing more. The mathematical sciences deal with similarities and equalities exclusively, and not with coexistences and sequences. Hence they have, in the first instance, no connection with the order of experience. The comparisons of mathematics are between numbers and extensive magnitudes, giving rise to arithmetic and geometry respectively.

Number seems to signify primarily the strokes of our attention in discriminating things. These strokes remain in the memory in groups, large or small, and the groups can be compared. The discrimination is, as we know, psychologically facilitated by the mobility of the thing as a total ([p. 173](#)). But within each thing we discriminate parts; so that the number of things which any one given phenomenon may be depends in the last instance on our way of taking it. A globe is one, if undivided; two, if composed of hemispheres. A sand-heap is one thing, or twenty thousand things, as we may choose to count it. We amuse ourselves by the counting of *mere* strokes, to form rhythms, and these we compare and name. Little by little in our minds the number-series is formed. This, like all lists of terms in which there is a direction of serial increase, carries with it the sense of those mediate relations between its terms which we expressed by the axiom "the more than the more is more than the less." That axiom seems, in fact, only a way of stating that the terms do form an increasing series. But, in addition to this, we are aware of certain other relations among our strokes of counting. We may interrupt them where we like, and go on again. All the while we feel that the interruption does not alter the strokes themselves. We may count 12 straight through; or count 7 and pause, and then count 5, but still the strokes will be the same. We thus distinguish between our acts of

counting and those of interrupting or grouping, as between an unchanged matter and an operation of mere shuffling performed on it. The matter is the original units or strokes; which all modes of grouping or combining simply give us back unchanged. In short, *combinations of numbers are combinations of their units*, which is the fundamental axiom of arithmetic, [542] leading to such consequences as that $7 + 5 = 8 + 4$ because both = 12. The general axiom of mediate equality, that equals of equals are equal, comes in here. [543] The principle of constancy in our meanings, when applied to strokes of counting, also gives rise to the axiom that the same number, operated on (interrupted, grouped) in the same way will always give the same result or be the same. How shouldn't it? Nothing is supposed changed.

Arithmetic and its fundamental principles are thus independent of our experiences or of the order of the world. The matter of arithmetic is *mental matter*; its principles flow from the fact that the matter forms a series, which can be cut into by us wherever we like without the matter changing. The empiricist school has strangely tried to interpret the truths of number as results of coexistences among outward things. John Mill calls number a physical property of things. 'One,' according to Mill, means one sort of passive sensation which we receive, 'two' another, 'three' a third. The same things, however, can give us different number-sensations. Three things arranged thus, ---, for example, impress us differently from three things arranged thus, -_- . But experience tells us that every real object-group which can be arranged in one of these ways can always be arranged in the other also, and that $2 + 1$ and 3 are thus modes of numbering things which 'coexist' invariably with each other. The indefeasibility of our belief in their 'coexistence' (which is Mill's word for their equivalence) is due solely to the enormous amount of experience we have of it. For all things, whatever other sensations they may give us, give us at any rate number-sensations. Those number-sensations which the same thing may be successively made to arouse are the numbers which we deem equal to each other; those which the same thing refuses to arouse are those which we deem unequal.

This is as clear a restatement as I can make of Mill's doctrine. [544] And its failure is written upon its front. Woe to arithmetic, were such the only grounds for its validity! The same real things are countable in numberless ways, and pass from one numerical form, not only to its equivalent (as Mill

implies), but to its other, as the sport of physical accidents or of our mode of attending may decide. How could our notion that one and one are eternally and necessarily two ever maintain itself in a world where every time we add one drop of water to another we get not two but one again? in a world where every time we add a drop to a crumb of quicklime we get a dozen or more?—had it no better warrant than such experiences? At most we could then say that one and one are *usually* two. Our arithmetical propositions would never have the confident tone which they now possess. That confident tone is due to the fact that they deal with abstract and ideal numbers exclusively. *What we mean* by one plus one *is* two; we *make* two out of it; and it would mean two still even in a world where *physically* (according to a conceit of Mill's) a third thing was engendered every time one thing came together with another. We are masters of our meanings, and discriminate between the things we mean and our ways of taking them, between our strokes of numeration themselves, and our bundlings and separatings thereof.

Mill ought not only to have said, "All things are numbered." He ought, in order to prove his point, to have shown that they are *unequivocally* numbered, which they notoriously are not. Only the abstract numbers themselves are unequivocal, only those which we create mentally and hold fast to as ideal objects always the same. A concrete natural thing can always be numbered in a great variety of ways. "We need only conceive a thing divided into four equal parts (and all things may be conceived as so divided)," as Mill is himself compelled to say, to find the number four in it, and so on.

The relation of numbers to experience is just like that of 'kinds' in logic. So long as an experience will keep its kind we can handle it by logic. So long as it will keep its number we can deal with it by arithmetic. *Sensibly*, however, things are constantly changing their numbers, just as they are changing their kinds. They are forever breaking apart and fusing. Compounds and their elements are never numerically identical, for the elements are sensibly many and the compounds sensibly one. Unless our arithmetic is to remain without application to life, we must somehow *make* more numerical continuity than we spontaneously find. Accordingly Lavoisier discovers his weight-units which remain the same in compounds and elements, though volume-units and quality-units all have changed. A

great discovery! And modern science outdoes it by denying that compounds exist at all. There is no such thing as 'water' for 'science;' that is only a handy name for H₂ and O when they have got into the position H-O-H, and then affect our senses in a novel way. The modern theories of atoms, of heat, and of gases are, in fact, only intensely artificial devices for gaining that constancy in the numbers of things which sensible experience will not show. "Sensible things are not the things for me," says Science, "because in their changes they will not keep their numbers the same. Sensible qualities are not the qualities for me, because they can with difficulty be numbered at all. These hypothetic atoms, however, are the things, these hypothetic masses and velocities are the qualities for me; they will stay numbered all the time."

By such elaborate inventions, and at such a cost to the imagination, do men succeed in making for themselves a world in which real things shall be coerced *per fas aut nefas* under arithmetical law.

The other branch of mathematics is *geometry*. Its objects are also ideal creations. Whether nature contain circles or not, I can know what I mean by a circle and can stick to my meaning; and when I mean two circles I mean two things of an identical kind. The axiom of constant results (see above, [p. 645](#)) holds in geometry. The same forms, treated in the same way (added, subtracted, or compared), give the same results—how shouldn't they? The axioms of mediate comparison ([p. 645](#)), of logic ([p. 648](#)), and of number ([p. 654](#)) all apply to the forms which we imagine in space, inasmuch as these resemble or differ from each other, form kinds, and are numerable things. But in addition to these general principles, which are true of space-forms only as they are of other mental conceptions, there are certain axioms relative to space-forms exclusively, which we must briefly consider.

Three of them give marks of identity among straight lines, planes, and parallels. Straight lines which have two points, planes which have three points, parallels to a given line which have one point, in common, coalesce throughout. Some say that the certainty of our belief in these axioms is due to repeated experiences of their truth; others that it is due to an intuitive

acquaintance with the properties of space. It is neither. We experience lines enough which pass through two points only to separate again, only we won't call them straight. Similarly of planes and parallels. We have a definite idea of what we mean by each of these words; and when something different is offered us, we see the difference. Straight lines, planes, and parallels, as they figure in geometry, are mere inventions of our faculty for apprehending serial increase. The farther continuations of these forms, we say, *shall* bear the same relation to their last visible parts which these did to still earlier parts. It thus follows (from that axiom of skipped intermediaries which obtains in all regular series) that parts of these figures separated by other parts must agree in direction, just as contiguous parts do. This uniformity of direction throughout is, in fact, all that makes us care for these forms, gives them their beauty, and stamps them into fixed conceptions in our mind. But obviously if two lines, or two planes, with a common segment, were to part company beyond the segment, it could only be because the direction of at least one of them had changed. Parting company in lines and planes *means* changing direction, means assuming a new relation to the parts that pre-exist; and assuming a new relation means ceasing to be straight or plane. If we mean by a parallel a line that will never meet a second line; and if we have one such line drawn through a point, any new line drawn through that point which does not coalesce with the first must be inclined to it, and if inclined to it must approach the second, i.e., cease to be parallel with it. No properties of outlying space need come in here: only a definite conception of uniform direction, and constancy in sticking to one's point.

The other two axioms peculiar to geometry are that figures can be moved in space without change, and that no variation in the way of subdividing a given amount of space alters its total quantity.^[545] This last axiom is similar to what we found to obtain in numbers. 'The whole is equal to its parts' is an abridged way of expressing it. A man is not the same biological whole if we cut him in two at the neck as if we divide him at the ankles; but geometrically he is the same whole, no matter in which place we cut him. The axiom about figures being movable in space is rather a postulate than an axiom. *So far as they are* so movable, then certain fixed equalities and differences obtain between forms, *no matter where placed*. But if translation through space warped or magnified forms, then the relations of equality, etc., would always have to be expressed with a position-

qualification added. A geometry as absolutely certain as ours could be invented on the supposition of such a space, if the laws of its warping and deformation were fixed. It would, however, be much more complicated than our geometry, which makes the simplest possible supposition; and finds, luckily enough, that it is a supposition with which the space of our experience seems to agree.

By means of these principles, all playing into each other's hands, the mutual equivalences of an immense number of forms can be traced, even of such as at first sight bear hardly any resemblance to each other. We move and turn them mentally, and find that parts of them will superpose. We add imaginary lines which subdivide or enlarge them, and find that the new figures resemble each other in ways which show us that the old ones are equivalent too. We thus end by expressing all sorts of forms in terms of other forms, enlarging our knowledge of the kinds of things which certain other kinds of things are, or to which they are equivalent.

The result is a new system of mental objects which can be treated as identical for certain purposes, a new series of *is*'s almost indefinitely prolonged, just like the series of equivalencies among numbers, part of which the multiplication-table expresses. And all this is in the first instance regardless of the coexistences and sequences of nature, and regardless of whether the figures we speak of have ever been outwardly experienced or not.

CONSCIOUSNESS OF SERIES IS THE BASIS OF RATIONALITY.

Classification, logic, and mathematics all result, then, from the mere play of the mind comparing its conceptions, no matter whence the latter may have come. The essential condition for the formation of all these sciences is that we should have grown capable of apprehending series as such, and of distinguishing them as homogeneous or heterogeneous, and as possessing definite directions of what I have called 'increase.' This consciousness of series is a human perfection which has been gradually evolved, and which varies greatly from man to man. There is no accounting for it as a result of habitual associations among outward impressions, so we must simply ascribe it to the factors, whatever they be, of inward cerebral growth. Once this consciousness attained to, however, *mediate* thought becomes possible;

with our very awareness of a series may go an awareness that dropping terms out of it will leave identical relations between the terms that remain; and thus arises a perception of relations between things so naturally separate that we should otherwise never have compared them together at all.

The axiom of skipped intermediaries applies, however, only to certain particular series, and among them to those which we have considered, in which the recurring relation is either of difference, of likeness, of kind, of numerical addition, or of prolongation in the same linear or plane direction. It is therefore not a purely formal law of thinking, but flows from the nature of the matters thought about. It will not do to say universally that in all series of homogeneously related terms the remote members are related to each other as the near ones are; for that will often be untrue. The series A is not B is not C is not D.... does not permit the relation to be traced between remote terms. From two negations no inference can be drawn. Nor, to become more concrete, does the lover of a woman generally love her beloved, or the contradictor of a contradictor contradict whomever he contradicts. The slayer of a slayer does not slay the latter's victim; the acquaintances or enemies of a man need not be each other's acquaintances or enemies; nor are two things which are on top of a third thing necessarily on top of each other.

All skipping of intermediaries and transfer of relations occurs within homogeneous series. But not all homogeneous series allow of intermediaries being skipped and relations transferred. It depends on which series they are, on what relations they contain.^[546] Let it not be said that it is a mere matter of verbal association, due to the fact that language sometimes permits us to transfer the *name* of a relation over skipped intermediaries, and sometimes does not; as where we call men 'progenitors' of their remote as well as of their immediate posterity, but refuse to call them 'fathers' thereof. There are relations which are *intrinsically* transferable, whilst others are not. The relation of *condition*, e.g., is intrinsically transferable. What conditions a condition conditions what it conditions—"cause of cause is cause of effect." The relations of negation and *frustration*, on the other hand, are not transferable: what frustrates a frustration does not frustrate what it frustrates. No changes of terminology would annul the intimate difference between these two cases.

Nothing but the clear sight of the ideas themselves shows whether the axiom of skipped intermediaries applies to them or not. Their connections, immediate and remote, flow from their inward natures. We try to consider them in certain ways, to bring them into certain relations, and we find that sometimes we can and sometimes we cannot *The question whether there are or are not inward and essential connections between conceived objects as such, really is the same thing as the question whether we can get any new perception from mentally coupling them together, or pass from one to another by a mental operation which gives a result.* In the case of some ideas and operations we get a result; but no result in the case of others. Where a result comes, it is due exclusively to the *nature* of the ideas and of the operation. Take blueness and yellowness, for example. We can operate on them in some ways, but not in other ways. We can compare them; but we cannot add one to or subtract it from the other. We can refer them to a common kind, color; but we cannot make one a kind of the other, or infer one from the other. This has nothing to do with experience. For we *can* add blue *pigment* to yellow *pigment*, and subtract it again, and get a result both times. Only we know perfectly that this is no addition or subtraction of the blue and yellow qualities or natures themselves. ^[547]

There is thus no denying the fact that *the mind is filled with necessary and eternal relations which it finds between certain of its ideal conceptions, and which form a determinate system, independent of the order of frequency in which experience may have associated the conception's originals in time and space.*

Shall we continue to call these sciences 'intuitive,' innate,' or '*a priori*' bodies of truth, or not?^[548] Personally I should like to do so. But I hesitate to use the terms, on account of the odium which controversial history has made the whole of their connotation for many worthy persons. The most politic way not to alienate these readers is to flourish the name of the immortal Locke. For in truth I have done nothing more in the previous pages than to make a little more explicit the teachings of Locke's fourth book:

"The immutability of the same relations between the same immutable things is now the idea that shows him that if the three angles of a triangle were once equal to two right angles, they will always be equal to two right ones. And hence he comes to be certain that what was once true in the case is always true; what ideas once agreed will always agree.... Upon this ground it is that particular demonstrations in mathematics afford general knowledge. If, then, the perception that the same ideas will eternally have the same habitudes and relations be not a sufficient ground of knowledge, there could be no knowledge of general propositions in mathematics.... All general knowledge lies only in our own thoughts, and consists barely in the contemplation of our abstract ideas. Wherever we perceive any agreement or disagreement amongst them, there we have general knowledge; and by putting the names of those ideas together accordingly in propositions, can with certainty pronounce general truths.... What is once known of such ideas will be perpetually and forever true. So that, as to all general knowledge, we must search and find it only in our own minds and it is only the examining of our own ideas that furnisheth us with that. Truths belonging to essences of things (that is, to abstract ideas) are eternal, and are to be found out only by the contemplation of those essences.... Knowledge is the consequence of the ideas (be they what they will) that are in our minds, producing there certain general propositions.... Such propositions are therefore called 'eternal truths,'... because, being once made about abstract ideas so as to be true, they will, whenever they can be supposed to be made again, at any time past or to come, by a mind having those ideas, always actually be true. For names being supposed to stand perpetually for the same ideas, and the same ideas having immutably the same habitudes one to another, propositions concerning any abstract ideas that are once true must needs be eternal verities."

But what are these eternal verities, these 'agreements,' which the mind discovers by barely considering its own fixed meanings, except what I have said?—relations of likeness and difference, immediate or mediate, between the terms of certain series. Classification is serial comparison, logic mediate subsumption, arithmetic mediate equality of different bundles of attention-strokes, geometry mediate equality of different ways of carving space. None

of these eternal verities has anything to say about facts, about what is or is not in the world. Logic does not say whether Socrates, men, mortals or immortals *exist*; arithmetic does not tell us where her 7's, 5's, and 12's are to be *found*; geometry affirms not that circles and rectangles are *real*. All that these sciences make us sure of is, that *if* these things are anywhere to be found, the eternal verities will obtain of them. Locke accordingly never tires of telling us that the

"universal propositions of whose truth or falsehood we can have certain knowledge, concern not existence.... These universal and self-evident principles, being only our constant, clear, and distinct knowledge of our own ideas more general or comprehensive, can assure us of nothing that passes without the mind; their certainty is founded only upon the knowledge of each idea by itself, and of its distinction from others; about which we cannot be mistaken whilst they are in our minds.... The mathematician considers the truth and properties belonging to a rectangle or circle only as they are in idea in his own mind. For it is possible he never found either of them existing mathematically, i.e., precisely true, in his life. But yet the knowledge he has of any truths or properties belonging to a circle, or any other mathematical figure, are nevertheless true and certain even of real things existing; because real things are no farther concerned nor intended to be meant by any such propositions, than as things really agree to those archetypes in his mind. Is it true of the idea of a triangle, that its three angles are equal to two right ones? It is true also of a triangle wherever it really exists. Whatever other figure exists that is not exactly answerable to that idea in his mind is not at all concerned in that proposition. And therefore he is certain all his knowledge concerning such ideas is real knowledge: because, intending things no farther than they agree with those his ideas, he is sure what he knows concerning those figures when they have barely an ideal existence in his mind will hold true of them also when they have a real existence in matter." But "that any or what bodies do exist, that we are left to our senses to discover to us as far as they can."^[549]

Locke accordingly distinguishes between 'mental truth' and 'real truth.'^[550] The former is intuitively certain; the latter dependent on experience. Only

hypothetically can we affirm intuitive truths of real things—by *supposing*, namely, that real things exist which correspond exactly with the ideal subjects of the intuitive propositions.

If our senses corroborate the supposition all goes well. But note the strange descent in Locke's hands of the dignity of *a priori* propositions. By the ancients they were considered, without farther question, to reveal the constitution of Reality. Archetypal things existed, it was assumed, in the relations in which we had to think them. The mind's necessities were a warrant for those of Being; and it was not till Descartes' time that scepticism had so advanced (in 'dogmatic' circles) that the warrant must itself be warranted, and the veracity of the Deity invoked as a reason for holding fast to our natural beliefs.

But the intuitive propositions of Locke leave us as regards outer reality none the better for their possession. We still have to "go to our senses" to find what the reality is. The vindication of the intuitionist position is thus a barren victory. The eternal verities which the very structure of our mind lays hold of do not necessarily themselves lay hold on extra-mental being, nor have they, as Kant pretended later,^[551] a legislating character even for all possible experience. They are primarily interesting only as subjective facts. They stand waiting in the mind, forming a beautiful ideal network; and the most we can say is that we *hope* to discover outer realities over which the network may be flung so that ideal and real may coincide.

And this brings us back to 'science' from which we diverted our attention so long ago (see [p. 640](#)). Science thinks that she has discovered the outer realities in question. Atoms and ether, with no properties but masses and velocities expressible by numbers, and paths expressible by analytic formulas, these at last are things over which the mathematico-logical network may be flung, and by supposing which instead of sensible phenomena science becomes yearly more able to manufacture for herself a world about which rational propositions may be framed. Sensible phenomena are pure delusions for the mechanical philosophy. The 'things' and qualities we instinctively believe in do not exist. The only realities are

swarming solids in everlasting motion, undulatory or continued, whose expressionless and meaningless changes of position form the history of the world, and are deducible from initial collocations and habits of movement hypothetically assumed. Thousands of years ago men started to cast the chaos of nature's sequences and juxtapositions into a form that might seem intelligible. Many were their ideal prototypes of rational order: teleological and æsthetic ties between things, causal and substantial bonds, as well as logical and mathematical relations. The most promising of these ideal systems at first were of course the richer ones, the sentimental ones. The baldest and least promising were the mathematical ones; but the history of the latter's application is a history of steadily advancing successes, whilst that of the sentimentally richer systems is one of relative sterility and failure.^[552] Take those aspects of phenomena which interest you as a human being most, and class the phenomena as perfect and imperfect, as ends and means to ends, as high and low, beautiful and ugly, positive and negative, harmonious and discordant, fit and unfit, natural and unnatural, etc., and barren are all your results. In the ideal world the kind 'precious' has characteristic properties. What is precious should be preserved; unworthy things should be sacrificed for its sake; exceptions made on its account; its preciousness is a reason for other things' actions, and the like. But none of these things need happen to your 'precious' object in the real world. Call the things of nature as much as you like by sentimental, moral, and æsthetic names, no natural consequences follow from the naming. They may be of the kinds you allege, but they are not of '*the kind's kind*': and the last great system-maker of this sort, Hegel, was obliged explicitly to repudiate logic in order to make any inferences at all from the names he called things by.

But when you give things mathematical and mechanical names and call them just so many solids in just such positions, describing just such paths with just such velocities, all is changed. Your sagacity finds its reward in the verification by nature of all the deductions which you may next proceed to make. Your 'things' realize all the *consequences* of the names by which you classed them. The modern mechanico-physical philosophy of which we are all so proud, because it includes the nebular cosmogony, the

conservation of energy, the kinetic theory of heat and gases, etc., etc., begins by saying that the *only* facts are collocations and motions of primordial solids, and the only laws the changes of motion which changes in collocation bring. The ideal which this philosophy strives after is a mathematical world-formula, by which, if all the collocations and motions at a given moment were known, it would be possible to reckon those of any wished-for future moment, by simply considering the necessary geometrical, arithmetical, and logical implications. Once we have the world in this bare shape, we can fling our net of *a priori* relations over all its terms, and pass from one of its phases to another by inward thought-necessity. Of course it is a world with a very minimum of rational *stuff*. The sentimental facts and relations are butchered at a blow. But the rationality yielded is so superbly complete in *form* that to many minds this atones for the loss, and reconciles the thinker to the notion of a purposeless universe, in which all the things and qualities men love, *dulcissima mundi nomina*, are but illusions of our fancy attached to accidental clouds of dust which will be dissipated by the eternal cosmic weather as carelessly as they were formed.

The popular notion that 'Science' is forced on the mind *ab extra*, and that our interests have nothing to do with its constructions, is utterly absurd. The craving to believe that the things of the world belong to kinds which are related by inward rationality together, is the parent of Science as well as of sentimental philosophy; and the original investigator always preserves a healthy sense of how plastic the materials are in his hands.

"Once for all," says Helmholtz in beginning that little work of his which laid the foundations of the 'conservation of energy,' "it is the task of the physical sciences to seek for laws by which particular processes in nature may be referred to general rules, and deduced from such again. Such rules (for example the laws of reflection or refraction of light, or that of Mariotte and Gay-Lussac for gas-volumes) are evidently nothing but generic-concepts for embracing whole classes of phenomena. The search for them is the business of the experimental division of our Science. Its theoretic division, on the other hand, tries to discover the unknown causes of processes from their visible effects; tries to understand them by the law of causality.... The ultimate goal of theoretic physics is to find the last *unchanging* causes of the processes

in Nature. Whether all processes be really ascribable to such causes, whether, in other words, *nature be completely intelligible*, or whether there be changes which would elude the law of a necessary causality, and fall into a realm of spontaneity or freedom, is not here the place to determine; but at any rate it is clear that the Science whose aim it is to make nature appear intelligible [*die Natur zu begreifen*] must start with the *assumption* of her intelligibility, and draw consequences in conformity with this assumption, until irrefutable facts show the limitations of this method.... The postulate that natural phenomena must be reduced to changeless ultimate causes next shapes itself so that *forces unchanged by time* must be found to be these causes. Now in Science we have already found portions of matter with changeless forces (indestructible qualities), and called them (chemical) elements. If, then, we imagine the world composed of elements with inalterable qualities, the only changes that can remain possible in such a world are spatial changes, i.e. movements, and the only outer relations which can modify the action of the forces are spatial too, or, in other words, the forces are motor forces dependent for their effect only on spatial relations. More exactly still: The phenomena of nature must be reduced to [*zurückgeföhrt*, conceived as, classed as] motions of material points with inalterable motor forces acting according to space-relations alone.... But points have no mutual space-relations except their distance,... and a motor force which they exert upon each other can cause nothing but a change of distance—i.e. be an attractive or a repulsive force.... And its intensity can only depend on distance. So that at last the task of Physics resolves itself into this, to refer phenomena to inalterable attractive and repulsive forces whose intensity varies with distance. The solution of this task would at the same time be the condition of Nature's complete intelligibility."^[553]

The subjective interest leading to the assumption could not be more candidly expressed. What makes the assumption 'scientific' and not merely poetic, what makes a Helmholtz and his kin *discoverers*, is that the things of Nature turn out to act as if they *were* of the kind assumed. They behave as such mere drawing and driving atoms would behave; and so far as they have been distinctly enough translated into molecular terms to test the point, so far a certain fantastically ideal object, namely, the mathematical

sum containing their mutual distances and velocities, is found to be constant throughout all their movements. This sum is called the total energy of the molecules considered. Its constancy or 'conservation' gives the name to the hypothesis of molecules and central forces from which it was logically deduced.

Take any other mathematico-mechanical theory and it is the same. They are all translations of sensible experiences into other forms, substitutions of items between which ideal relations of kind, number, form, equality, etc., obtain, for items between which no such relations obtain; coupled with declarations that the experienced form is false and the ideal form true, declarations which are justified by the appearance of new sensible experiences at just those times and places at which we logically infer that their ideal correlates ought to be. Wave-hypotheses thus make us predict rings of darkness and color, distortions, dispersions, changes of pitch in sonorous bodies moving from us, etc.; molecule-hypotheses lead to predictions of vapor-density, freezing point, etc.,—all which predictions fall true.

Thus the world grows more orderly and rational to the mind, which passes from one feature of it to another by deductive necessity, as soon as it conceives it as made up of so few and so simple phenomena as bodies with no properties but number and movement to and fro.

METAPHYSICAL AXIOMS.

But alongside of these ideal relations between terms which the world verifies, there are other ideal relations not as yet so verified. I refer to those propositions (no longer expressing mere results of comparison) which are formulated in such metaphysical and æsthetic axioms as "The Principle of things is one;" "The quantity of existence is unchanged;" "Nature is simple and invariable;" "Nature acts by the shortest ways;" "*Ex nihilo nihil fit*;" "Nothing can be evolved which was not involved;" "Whatever is in the effect must be in the cause;" "A thing can only work where it is;" "A thing can only affect another of its own kind;" "*Cessante causa, cessat et effectus*;" "Nature makes no leaps;" "Things belong to discrete and permanent kinds;" "Nothing is or happens without a reason;" "The world is throughout rationally intelligible;" etc., etc., etc. Such principles as these,

which might be multiplied to satiety,^[554] are properly to be called *postulates of rationality*, not propositions of fact. If nature *did* obey them, she *would* be *pro tanto* more intelligible; and we seek meanwhile so to conceive her phenomena as to show that she does obey them. To a certain extent we succeed. For example, instead of the 'quantity of existence' so vaguely postulated as unchanged, Nature allows us to suppose that curious sum of distances and velocities which for want of a better term we call 'energy.' For the effect being 'contained in the cause,' nature lets us substitute 'the effect *is* the cause,' so soon as she lets us conceive both effect and cause as the same molecules, in two successive positions.—But all around these incipient successes (as all around the molecular world, so soon as we add to it as its 'effects' those illusory 'things' of common-sense which we had to butcher for its sake), there still spreads a vast field of irrationalized fact whose items simply *are* together, and from one to another of which we can pass by no ideally 'rational' way.

It is not that these more metaphysical postulates of rationality are absolutely barren—though barren enough they were when used, as the scholastics used them, as immediate propositions of fact.^[555] They have a fertility as ideals, and keep us uneasy and striving always to recast the world of sense until its lines become more congruent with theirs. Take for example the principle that 'nothing can happen without a cause.' We have no definite idea of what we mean by cause, or of what causality consists in. But the principle expresses a demand for *some* deeper sort of inward connection between phenomena than their merely habitual time-sequence seems to us to be. The word 'cause' is, in short, an altar to an unknown god; an empty pedestal still marking the place of a hoped-for statue. *Any* really inward belonging-together of the sequent terms, if discovered, would be accepted as what the word cause was meant to stand for. So we seek, and seek; and in the molecular systems we find a sort of inward belonging in the notion of identity of matter with change of collocation. Perhaps by still seeking we may find other sorts of inward belonging, even between the molecules and those 'secondary qualities,' etc., which they produce upon our minds.

It cannot be too often repeated that the triumphant application of any one of our ideal systems of rational relations to the real world justifies our hope that other systems may be found also applicable. Metaphysics should take heart from the example of physics, simply confessing that hers is the longer

task. Nature *may* be remodelled, nay, certainly will be remodelled, far beyond the point at present reached. Just how far?—is a question which only the whole future history of Science and Philosophy can answer.^[556] Our task being Psychology, we cannot even cross the threshold of that larger problem.

Besides the mental structure which results in such metaphysical principles as those just considered, there is a mental structure which expresses itself in

ÆSTHETIC AND MORAL PRINCIPLES.

The æsthetic principles are at bottom such axioms as that a note sounds good with its third and fifth, or that potatoes need salt. We are once for all so made that when certain impressions come before our mind, one of them will seem to call for or repel the others as its companions. To a certain extent the principle of habit will explain these æsthetic connections. When a conjunction is repeatedly experienced, the cohesion of its terms grows grateful, or at least their disruption grows unpleasant. But to explain *all* æsthetic judgments in this way would be absurd; for it is notorious how seldom natural experiences come up to our æsthetic demands. Many of the so-called metaphysical principles are at bottom only expressions of æsthetic feeling. Nature is simple and invariable; makes no leaps, or makes nothing but leaps; is rationally intelligible; neither increases nor diminishes in quantity; flows from one principle, etc., etc.,—what do all such principles express save our sense of how pleasantly our intellect would feel if it had a Nature of that sort to deal with? The subjectivity of which feeling is of course quite compatible with Nature also turning out objectively to be of that sort, later on.

The *moral* principles which our mental structure engenders are quite as little explicable *in toto* by habitual experiences having bred inner cohesions. Rightness is not *mere* usualness, wrongness not *mere* oddity, however numerous the facts which might be invoked to prove such identity. Nor are the moral judgments those most invariably and emphatically impressed on us by public opinion. The most characteristically and peculiarly moral

judgments that a man is ever called on to make are in unprecedented cases and lonely emergencies, where no popular rhetorical maxims can avail, and the hidden oracle alone can speak; and it speaks often in favor of conduct quite unusual, and suicidal as far as gaining popular approbation goes. The forces which conspire to this resultant are subtle harmonies and discords between the elementary ideas which form the data of the case. Some of these harmonies, no doubt, have to do with habit; but in respect to most of them our sensibility must assuredly be a phenomenon of supernumerary order, correlated with a brain-function quite as secondary as that which takes cognizance of the diverse excellence of elaborate musical compositions. No more than the higher musical sensibility can the higher moral sensibility be accounted for by the frequency with which outer relations have cohered.^[557] Take judgments of justice or equity, for example. Instinctively, one judges everything differently, according as it pertains to one's self or to some one else. Empirically one notices that everybody else does the same. But little by little there dawns in one the judgment "nothing can be right for me which would not be right for another similarly placed;" or "the fulfilment of my desires is intrinsically no more imperative than that of anyone else's;" or "what it is reasonable that another should do for me, it is also reasonable that I should do for him,"^[558] and forthwith the whole mass of the habitual gets overturned. It gets *seriously* overturned only in a few fanatical heads. But its overturning is due to a back-door and not to a front-door process. Some minds are preternaturally sensitive to logical consistency and inconsistency. When they have ranked a thing under a kind, they *must* treat it as of that kind's kind, or feel all out of tune. In many respects we do class ourselves with other men, and call them and ourselves by a common name. They agree with us in having the same Heavenly Father, in not being consulted about their birth, in not being themselves to thank or blame for their natural gifts, in having the same desires and pains and pleasures, in short in a host of fundamental relations. Hence, *if these things be our essence*, we should be substitutable for other men, and they for us, in any proposition in which either of us is involved. The more fundamental and common the essence chosen, and the more simple the reasoning,^[559] the more wildly radical and unconditional will the justice be which is aspired to. Life is one long struggle between conclusions based on abstract ways of conceiving cases, and opposite conclusions prompted by our instinctive perception of them as individual facts. The

logical stickler for justice always seems pedantic and mechanical to the man who goes by tact and the particular instance, and who usually makes a poor show at argument. Sometimes the abstract conceiver's way is better, sometimes that of the man of instinct. But just as in our study of reasoning we found it impossible to lay down any mark whereby to distinguish *right* conception of a concrete case from *confusion* (see [pp. 336, 350](#)), so here we can give no general rule for deciding when it is morally useful to treat a concrete case as *sui generis*, and when to lump it with others in an abstract class.^[560]

An adequate treatment of the way in which we come by our æsthetic and moral judgments would require a separate chapter, which I cannot conveniently include in this book. Suffice it that these judgments express inner harmonies and discords between objects of thought; and that whilst outer cohesions frequently repeated will often seem harmonious, all harmonies are not thus engendered, but our feeling of many of them is a secondary and incidental function of the mind. Where harmonies are asserted of the real world, they are obviously mere postulates of rationality, so far as they transcend experience. Such postulates are exemplified by the ethical propositions that the individual and universal good are one, and that happiness and goodness are bound to coalesce in the same subject.

SUMMARY OF WHAT PRECEDES.

I will now sum up our progress so far by a short summary of the most important conclusions which we have reached.

The mind has a native structure in this sense, that certain of its objects, if considered together in certain ways, give definite results; and that no other ways of considering, and no other results, are possible if the same objects be taken.

The results are 'relations' which are all expressed by judgments of subsumption and of comparison.

The judgments of subsumption are themselves subsumed under the *laws of logic*.

Those of comparison are expressed in *classifications*, and in the *sciences of arithmetic and geometry*.

Mr. Spencer's opinion that our consciousness of classificatory, logical, and mathematical relations between ideas is due to the frequency with which the corresponding 'outer relations' have impressed our minds, is unintelligible.

Our consciousness of these relations, no doubt, has a natural genesis. But it is to be sought rather in the inner forces which have made the brain grow, than in any mere paths of 'frequent' association which outer stimuli may have ploughed in that organ.

But let our sense for these relations have arisen as it may, the relations themselves form a fixed system of lines of cleavage, so to speak, in the mind, by which we naturally pass from one object to another; and the objects connected by these lines of cleavage are often not connected by any regular time- and space-associations. We distinguish, therefore, between the empirical order of things, and this their rational order of comparison; and, so far as possible, we seek to translate the former into the latter, as being the more congenial of the two to our intellect.

Any classification of things into kinds (especially if the kinds form series, or if they successively involve each other) is a more rational way of conceiving the things than is that mere juxtaposition or separation of them as individuals in time and space which is the order of their crude perception. Any assimilation of things to terms between which such classificatory relations, with their remote and mediate transactions, obtain, is a way of bringing the things into a more rational scheme.

Solids in motion are such terms; and the mechanical philosophy is only a way of conceiving nature so as to arrange its items along some of the more natural lines of cleavage of our mental structure.

Other natural lines are the moral and æsthetic relations. Philosophy is still seeking to conceive things so that these relations also may seem to obtain between them.

As long as things have not successfully been so conceived, the moral and æsthetic relations obtain only between *entia rationis*, terms in the mind; and the moral and æsthetic principles remain but postulates, not propositions, with regard to the real world outside.

There is thus a large body of *a priori* or intuitively necessary truths. As a rule, these are truths of *comparison* only, and in the first instance they express relations between merely mental terms. Nature, however, acts as if some of her realities were identical with these mental terms. So far as she does this, we can make *a priori* propositions concerning natural fact. The aim of both science and philosophy is to make the identifiable terms more numerous. So far it has proved easier to identify nature's things with mental terms of the mechanical than with mental terms of the sentimental order.

The widest postulate of rationality is that the world *is* rationally intelligible throughout, after the pattern of *some* ideal system. The whole war of the philosophies is over that point of faith. Some say they can see their way already to the rationality; others that it is hopeless in any other but the mechanical way. To some the very fact that there is a world at all seems irrational. Nonentity would be a more natural thing than existence, for these minds. One philosopher at least says that the relatedness of things to each other is irrational anyhow, and that a world of relations can never be made intelligible.^[561]

With this I may be assumed to have completed the programme which I announced at the beginning of the chapter, so far as the *theoretic* part of our organic mental structure goes. It can be due neither to our own nor to our ancestors' experience. I now pass to those practical parts of our organic mental structure. Things are a little different here; and our conclusion, though it lies in the same direction, can be by no means as confidently expressed.

To be as short and simple as possible, I will take the case of instincts, and, supposing the reader to be familiar with [Chapter XXIV](#), I will plunge *in medias res*.

THE ORIGIN OF INSTINCTS.

Instincts must have been either

- 1) Each specially created in complete form, or
- 2) Gradually evolved.

As the first alternative is nowadays obsolete, I proceed directly to the second. The two most prominent suggestions as to the way in which instincts may have been evolved are associated with the names of Lamarck and Darwin.

Lamarck's statement is that animals have *wants*, and contract, to satisfy them, *habits* which transform themselves gradually into so many propensities which they can neither resist nor change. These *propensities*, once acquired, propagate themselves by way of transmission to the young, so that they come to exist in new individuals, anteriorly to all exercise. Thus are the same emotions, the same habits, the same *instincts*, perpetuated without variation from one generation to another, so long as the outward conditions of existence remain the same.^[562] Mr. Lewes calls this the theory of 'lapsed intelligence.' Mr. Spencer's words are clearer than Lamarck's, so that I will quote from him:^[563]

"Setting out with the unquestionable assumption, that every new form of emotion making its appearance in the individual or the race is a modification of some pre-existing emotion, or a compounding of several pre-existing emotions, we should be greatly aided by knowing what always are the pre-existing emotions. When, for example, we find that very few, if any, of the lower animals show any love of accumulation, and that this feeling is absent in infancy; when we see that an infant in arms exhibits anger, fear, wonder, while yet it manifests no desire of permanent possession; and that a brute which has no acquisitive emotion can nevertheless feel attachment, jealousy, love of approbation,—we may suspect that the feeling which property satisfies is compounded out of simpler and deeper feelings. We may conclude that as when a dog hides a bone there must exist in him a prospective gratification of hunger, so there must similarly, at first, in all cases where anything is secured or taken possession of, exist an ideal excitement of the feeling which that thing will gratify. We may further conclude that when the intelligence is such that a variety of objects come to be utilized for different purposes; when, as among savages, divers wants are satisfied through the articles appropriated for weapons, shelter, clothing, ornament,—the act of appropriating comes to be one constantly involving agreeable associations, and one which is therefore pleasurable, irrespective of the end subserved. And when, as

in civilized life, the property acquired is of a kind not conducing to one order of gratifications, but is capable of ministering to all gratifications, the pleasure of acquiring property grows more distinct from each of the various pleasures subserved—is more completely differentiated into a separate emotion.^[564] It is well known that on newly-discovered islands not inhabited by man, birds are so devoid of fear as to allow themselves to be knocked over with sticks, but that in the course of generations they acquire such a dread of man as to fly on his approach, and that this dread is manifested by young as well as old. Now unless this change be ascribed to the killing off of the least fearful, and the preservation and multiplication of the more fearful, which, considering the small number killed by man, is an inadequate cause, it must be ascribed to accumulated experiences, and each experience must be held to have a share in producing it. We must conclude that in each bird that escapes with injuries inflicted by man, or is alarmed by the outcries of other members of the flock,... there is established an association of ideas between the human aspect and the pains, direct and indirect, suffered from human agency. And we must further conclude that the state of consciousness which impels the bird to take flight is at first nothing more than an ideal reproduction of those painful impressions which before followed man's approach; that such ideal reproduction becomes more vivid and more massive as the painful experiences, direct or sympathetic, increase; and that thus the emotion, in its incipient state, is nothing else than an aggregation of the revived pains before experienced. As, in the course of generations, the young birds of this race begin to display a fear of man before they have been injured by him, it is an unavoidable inference that the nervous system of the race has been organically modified by these experiences; we have no choice but to conclude that when a young bird is thus led to fly, it is because the impression produced on its senses by the approaching man entails, through an incipiently reflex action, a partial excitement of all those nerves which, in its ancestors, had been excited under the like conditions; that this partial excitement has its accompanying painful consciousness; and that the vague painful consciousness thus arising constitutes emotion proper—*emotion undecomposable into specific experiences, and therefore seemingly homogeneous. If such be the explanation of the fact in this case, then it*

is in all cases. If the emotion is so generated here, then it is so generated throughout. If so, we must perforce conclude that the emotional modifications displayed by different nations, and those higher emotions by which civilized are distinguished from savage, are to be accounted for on the same principle. And, concluding this, we are led strongly to suspect that the emotions in general have severally thus originated."^[565]

Obviously the word 'emotion' here means instinct as well,—the actions we call instinctive are expressions or manifestations of the emotions whose genesis Mr. Spencer describes. Now if habit could thus bear fruit outside the individual life, and if the modifications so painfully acquired by the parents' nervous systems could be found ready-made at birth in those of the young, it would be hard to overestimate the importance, both practical and theoretical, of such an extension of its sway. In principle, instincts would then be assimilated to 'secondarily-automatic' habits, and the origin of many of them out of tentative experiments made during ancestral lives, perfected by repetition, addition, and association through successive generations, would be a comparatively simple thing to understand.

Contemporary students of instinct have accordingly been alert to discover all the facts which would seem to establish the possibility of such an explanation. The list is not very long, considering what a burden of conclusions it has to bear. Let acquisitiveness and fear of man, as just argued for by Spencer, lead it off. Other cases of the latter sort are the increased shyness of the woodcock noticed to have occurred within sixty years' observation by Mr. T. A. Knight, and the greater shyness everywhere shown by large than by small birds, to which Darwin has called attention. Then we may add—

The propensities of 'pointing,' 'retrieving,' etc., in sporting dogs, which seem partly, at any rate, to be due to training, but which in well-bred stock are all but innate. It is in these breeds considered bad for a litter of young if its sire or dam have not been trained in the field.

Docility of domestic breeds of horses and cattle.

Tameness of young of tame rabbit—young wild rabbits being invincibly timid.

Young foxes are most wary in those places where they are most severely hunted.

Wild ducks, hatched out by tame ones, fly off. But if kept close for some generations, the young are said to become tame.^[566]

Young savages at a certain age will revert to the woods.

English greyhounds taken to the high plateau of Mexico could not at first run well, on account of rarefied air. Their whelps entirely got over the difficulty.

Mr. Lewes somewhere^[567] tells of a terrier pup whose parents had been taught to 'beg,' and who constantly threw himself spontaneously into the begging attitude. Darwin tells of a French orphan-child, brought up out of France, yet *shrugging* like his ancestors.^[568]

Musical ability often increases from generation to generation in the families of musicians.

The hereditarily epileptic guinea-pigs of Brown-Séguard, whose parents had become epileptic through surgical operations on the spinal cord or sciatic nerve. The adults often lose some of their hind toes, and the young, in addition to being epileptic, are frequently born with the corresponding toes lacking. The offspring of guinea-pigs whose cervical sympathetic nerve has been cut on one side will have the ear larger, the eyeball smaller, etc., just like their parents after the operation. Puncture of the 'restiform body' of the medulla will, in the same animal, congest and enlarge one eye, and cause gangrene of one ear. In the young of such parents the same symptoms occur.

Physical refinement, delicate hands and feet, etc., appear in families well-bred and rich for several generations.

The 'nervous' temperament also develops in the descendants of sedentary brain-working people.

Inebriates produce offspring in various ways degenerate.

Nearsightedness is produced by indoor occupation for generations. It has been found in Europe much more frequent among schoolchildren in towns than among children of the same age in the country.

These latter cases are of the inheritance of structural rather than of functional peculiarities. But as structure gives rise to function it may be said that the principle is the same. Amongst other inheritances of adaptive^[569] structural change may be mentioned:

The 'Yankee' type.

Scrofula, rickets, and other diseases of bad conditions of life.

The udders and permanent milk of the domestic breeds of cow.

The 'fancy' rabbit's ears, drooping through lack of need to erect them. Dog's, ass's, etc., in some breeds ditto.

The obsolete eyes of mole and various cave-dwelling animals.

The diminished size of the wing-bones of domesticated ducks, due to ancestral disuse of flight.^[570]

These are about all the facts which, by one author or another, have been invoked as evidence in favor of the 'lapsed intelligence' theory of the origin of instincts.

Mr. Darwin's theory is that of the natural selection of accidentally produced tendencies to action.

"It would," says he, "be the most serious error to suppose that the greater number of instincts have been acquired by habit in one generation, and then transmitted by inheritance in succeeding generations. It can clearly be shown that the most wonderful instincts with which we are acquainted, namely, those of the hive-bee and of many ants, could not possibly have been thus acquired."^[571] It will be universally admitted that instincts are as important as corporeal structure for the welfare of each species, under its present conditions of life. Under changed conditions of life, it is at least possible that slight modifications of instinct might be profitable to a species; and if it can be shown that instincts do vary ever so little, then I can see no difficulty in natural selection preserving and continually accumulating variations of instinct to any extent that may be profitable. It is thus, as I believe, that all the most complex and wonderful instincts have arisen.... I believe that the effects of habit are of quite subordinate importance to the effects of the natural selection of what may be called accidental variations of instincts;—that is, of variations produced by

the same unknown causes which produce slight deviations of bodily structure."^[572]

The evidence for Mr. Darwin's view is too complex to be given in this place. To my own mind it is quite convincing. If, with the Darwinian theory in mind, one re-reads the list of examples given in favor of the Lamarckian theory, one finds that many of the cases are irrelevant, and that some make for one side as well as for the other. This is so obvious in many of the cases that it is needless to point it out in detail. The shrugging child and the begging pup, e.g., prove somewhat too much. They are examples so unique as to suggest spontaneous variation rather than inherited habit. In other cases the observations much need corroboration, e.g., the effects of not training for a generation in sporting dogs and race-horses, the difference between young wild rabbits born in captivity and young tame ones, the cumulative effect of many generations of captivity on wild ducks, etc.

Similarly, the increased wariness of the large birds, of those on islands frequented by men, of the woodcock, of the foxes, may be due to the fact that the bolder families have been killed off, and left none but the naturally timid behind, or simply to the individual experience of older birds being imparted by example to the young so that a new *educational tradition* has occurred.—The cases of physical refinement, nervous temperament, Yankee type, etc., also need much more discriminating treatment than they have yet received from the Lamarckians. There is no real evidence that physical refinement and nervousity tend to accumulate from generation to generation in aristocratic or intellectual families; nor is there any that the change in that direction which Europeans transplanted to America undergo is not all completed in the first generation of children bred on our soil. To my mind, the facts all point that way. Similarly the better breathing of the greyhounds born in Mexico was surely due to a post-natal adaptation of the pups' thorax to the rarer air.

Distinct neurotic *degeneration* may undoubtedly accumulate from parent to child, and as the parent usually in this case grows worse by his own irregular habits of life, the temptation lies near to ascribe the child's deterioration to this cause. This, again, is a hasty conclusion. For neurotic degeneration is unquestionably a disease whose original causes are unknown; and like other 'accidental variations' it is hereditary. But it

ultimately ends in sterility; and it seems to me quite unfair to draw any conclusions from its natural history in favor of the transmission of acquired peculiarities. Nor does the degeneration of the children of alcoholics prove anything in favor of their having inherited the shattered nervous system which the alcohol has induced in their parents: because the poison usually has a chance to directly affect their own bodies before birth, by acting on the germinal matter from which they are formed whilst it is still nourished by the alcoholized blood of the parent. In many cases, moreover, the parental alcoholics are themselves degenerates neurotically, and the drink-habit is only a symptom of their disease, which in some form or other they also propagate to their children.

There remain the inherited mutilations of the guinea-pig. But these are such startling exceptions to the ordinary rule with animals that they should hardly be used as examples of a typical process. The docility of domestic cattle is certainly in part due to man's selection, etc., etc. In a word, the proofs form rather a beggarly array.

Add to this that the writers who have tried to carry out the theory of transmitted habit with any detail are always obliged *somewhere* to admit inexplicable variation. Thus Spencer allows that

"Sociality can begin only where, through some slight variation, there is less tendency than usual for the individuals to disperse.... That slight variations of mental nature, sufficient to initiate this process, may be fairly assumed, all our domestic animals show us: differences in their characters and likings are conspicuous. Sociality having thus commenced, and survival of the fittest tending ever to maintain and increase it, it will be further strengthened by the inherited effects of habit."^[573] Again, in writing of the pleasure of pity, Mr. Spencer says: "This feeling is not one that has arisen through the inherited effects of experiences, but belongs to a quite different group, traceable to the survival of the fittest simply—to the natural selection of incidental variations. In this group are included all the bodily appetites, together with those simpler instincts, sexual and parental, by which every race is maintained; and which must exist before the higher processes of mental evolution can commence."^[574]

The inheritance of tricks of manner and trifling peculiarities, such as handwriting, certain odd gestures when pleased, peculiar movements during sleep, etc., have also been quoted in favor of the theory of transmission of acquired habits. Strangely enough; for of all things in the world these tricks seem most like idiosyncratic variations. They are usually defects or oddities which the education of the individual, the pressure of what is really *acquired* by him, would counteract, but which are too native to be repressed, and breaks through all artificial barriers, in his children as well as in himself.

I leave my text practically just as it was written in 1885. I proceeded at that time to draw a tentative conclusion to the effect that the origin of *most* of our instincts must certainly be deemed fruits of the back-door method of genesis, and not of ancestral experience in the proper meaning of the term. Whether acquired ancestral habits played any part at all in their production was still an open question in which it would be as rash to affirm as to deny. Already before that time, however, Professor Weismann of Freiburg had begun a very serious attack upon the Lamarckian theory,^[575] and his polemic has at last excited such a widespread interest among naturalists that the whilom almost unhesitatingly accepted theory seems almost on the point of being abandoned.

I will therefore add some of Weismann's criticisms of the supposed evidence to my own. In the first place, he has a captivating theory of descent of his own,^[576] which makes him think it *a priori* impossible that any peculiarity acquired during lifetime by the parent should be transmitted to the germ. Into the nature of that theory this is not the place to go. Suffice to say that it has made him a keener critic of Lamarck's and Spencer's theory than he otherwise might have been. The only way in which the germinal products can be influenced whilst in the body of the parent is, according to Weismann, by good or bad nutrition. Through this they may degenerate in various ways or lose vitality altogether. They may also be infected through the blood by small-pox, syphilis, or other virulent diseases, and otherwise be poisoned. But peculiarities of neural structure and habit in the parents *which the parents themselves were not born with*, they can never

acquire unless perhaps accidentally through some coincidental variation of their own. *Accidental* variations develop of course into idiosyncrasies which tend to pass to later generations in virtue of the well-known law which no one doubts.

Referring to the often-heard assertion that the increase of talent found in certain families from one generation to another is due to the transmitted effects of *exercise* of the faculty concerned (the Bachs, the Bernoullis, Mozart, etc.), he sensibly remarks, that the talent being kept in exercise, it ought to have gone on growing for an indefinite number of generations. As a matter of fact, it quickly reaches a maximum, and then we hear no more of it, which is what happens always when an idiosyncrasy is exposed to the effects of miscellaneous intermarriage.

The hereditary epilepsy and other degenerations of the operated guinea-pigs are explained by Professor Weismann as results of *infection* of the young by the parent's blood. The latter he supposes to undergo a pathologic change in consequence of the original traumatic injury. The obsolescence of disused organs he explains very satisfactorily, without invoking any transmission of the direct effects of disuse, by his theory of *panmixy*, for which I must refer to his own writings. Finally, he criticises searchingly the stories we occasionally hear of inherited mutilations in animals (dogs' ears and tails, etc.), and cites a prolonged series of experiments of his own on mice, which he bred for many generations, cutting off both parental tails each time, without interfering in the least with the length of tail with which the young continued to be born.

The strongest argument, after all, in favor of the Lamarckian theory remains the *a priori* one urged by Spencer in his little work (much the solidest thing, by the way, which he has ever written) 'The Factors of Organic Evolution.' Since, says Mr. Spencer, the accidental variations of all parts of the body are independent of each other, if the entire organization of animals were due to such accidental variations alone, the amount of mutual adaptation and harmony that we now find there could hardly possibly have come about in any finite time. We must rather suppose that the divers varying parts *brought* the other parts into harmony with themselves by *exercising them ad hoc*, and that the effects of the exercise remained and were passed on to the young. This forms, of course, a great *presumption* against the all-sufficiency of the view of selection of accidental variations exclusively. But it must be

admitted that in favor of the contrary view, that adaptive changes are inherited, we have as yet perhaps not one single unequivocal item of positive proof.

I must therefore end this chapter on the genesis of our mental structure by reaffirming my conviction that the so-called Experience-philosophy has failed to prove its point. No more if we take ancestral experiences into account than if we limit ourselves to those of the individual after birth, can we believe that the couplings of terms within the mind are simple copies of corresponding couplings impressed upon it by the environment. This indeed is true of a small part of our cognitions. But so far as logical and mathematical, ethical, æsthetical, and metaphysical propositions go, such an assertion is not only untrue but altogether unintelligible; for these propositions say nothing about the time- and space-order of things, and it is hard to understand how such shallow and vague accounts of them as Mill's and Spencer's could ever have been given by thinking men.

The causes of our mental structure are doubtless natural, and connected, like all our other peculiarities, with those of our nervous structure. Our interests, our tendencies of attention, our motor impulses, the æsthetic, moral, and theoretic combinations we delight in, the extent of our power of apprehending schemes of relation, just like the elementary relations themselves, time, space, difference and similarity, and the elementary kinds of feeling, have all grown up in ways of which at present we can give no account. Even in the clearest parts of Psychology our insight is insignificant enough. And the more sincerely one seeks to trace the actual course of *psychogenesis*, the steps by which as a race we may have come by the peculiar mental attributes which we possess, the more clearly one perceives "the slowly gathering twilight close in utter night."

THE END.

[526] 'Accidental' in the Darwinian sense, as belonging to a cycle of causation inaccessible to the present order of research.

[527] The passage is in § 207 of the Principles of Psychology, at the end of the chapter entitled 'Reason.' I italicize certain words in order to show that the essence of this explanation is to demand *numerically frequent* experiences. The bearing of this remark will later appear. (Cf. pp. 641-2, *infra*.)

[528] Principles of Biology, part iii. chaps. xi, xii.—Goltz and Loeb have found that dogs become mild in character when their occipital, and fierce when their frontal, brain-lobes are cut off. "A dog which originally was cross in an extreme degree, never suffering himself to be touched, and even refusing, after two days' fasting, to take a piece of bread from my hand, became, after a bilateral operation on the occipital lobes, perfectly trustful and harmless. He underwent five operations on these parts.... Each one of them made him more good-natured; so that at last (just as Goltz observed of his dogs) he would let other dogs take away the very bones which he was gnawing" (Loeb, Pflüger's Archiv, xxxix. 300). A course of kind treatment and training might have had a similar effect. But how absurd to call two such different causes by the same name, and to say both times that the beast's 'experience of outer relations' is what educates him to good-nature. This, however, is virtually what all writers do who ignore the distinction between the 'front-door' and the back-door' manners of producing mental change.

One of the most striking of these back-door affections is *susceptibility to the charm of drunkenness*. This (taking drunkenness in the broadest sense, as teetotalers use the word) is one of the deepest functions of human nature. Half of both the poetry and the tragedy of human life would vanish if alcohol were taken away. As it is, the thirst for it is such that in the United States the cash-value of its sales amounts to that of the sales of meat and of bread put together. And yet what ancestral 'outer relation' is responsible for this peculiar reaction of ours? The only 'outer relation' could be the alcohol itself, which, comparatively speaking, came into the environment but yesterday, and which, so far from creating, is tending to eradicate, the love of itself from our mental structure, by letting only those families of men survive in whom it is not strong. The love of drunkenness is a purely accidental susceptibility of a brain, evolved for entirely different uses, and its causes are to be sought in the molecular realm, rather than in any possible order of 'outer relations.'

[529] Mr. Grant Allen, in a brilliant article entitled Idiosyncrasy (Mind, viii. 498), seeks to show that accidental morphological changes in the brain cannot possibly be imagined to result in any mental change of a sort which would *fit the animal to its environment*. If spontaneous variation ever works on the brain, its product, says Mr. Allen, ought to be an idiot or a raving madman, not a minister and interpreter of Nature. Only the environment can change us in the direction of accommodation *to itself*. But I think we ought to know a little better just what the molecular changes in the brain are on which thought depends, before we talk so confidently about what the effect can be of their possible variations. Mr. Allen, it should be said, has made a laudable effort to conceive them distinctly. To me his conception remains too purely anatomical. Meanwhile this essay and another by the same author in the Atlantic Monthly are probably as serious attempts as any that have been made towards applying the Spencerian theory in a radical way to the facts of human history.

[530] In my own previous chapters on habit, memory, association, and perception, justice has been done to all these facts.

[531] "The order of nature, as perceived at a first glance, presents at every instant a chaos followed by another chaos. We must decompose each chaos into single facts. We must learn to see in the chaotic antecedent a multitude of distinct antecedents, in the chaotic consequent a multitude of distinct consequents. This, supposing it done, will not of itself tell us on which of the antecedents each consequent is invariably attendant. To determine that point, we must endeavor to effect a separation of the facts from one another, not in our minds only, but in nature. The mental analysis,

however, must take place first. And every one knows that in the mode of performing it, one intellect differs immensely from another." (J. S. Mill, *Logic*, bk. iii. chap. vii. § 1.)

[532] I quote from an address entitled 'Reflex Action and Theism,' published in the 'Unitarian Review' for November 1881, and translated in the *Critique Philosophique* for January and February 1882. "The conceiving or theorizing faculty works exclusively for the sake of ends that do not exist at all in the world of the impressions received by way of our senses, but are set by our emotional and practical subjectivity. It is a transformer of the world of our impressions into a totally different world, the world of our conception; and the transformation is effected in the interests of our volitional nature, and for no other purpose whatsoever. Destroy the volitional nature, the definite subjective purposes, preferences, fondness for certain effects, forms, orders, and not the slightest motive would remain for the brute order of our experience to be remodelled at all. But, as we have the elaborate volitional constitution we do have, the remodelling must be effected, there is no escape. The world's contents are *given* to each of us in an order so foreign to our subjective interests that we can hardly by an effort of the imagination picture to ourselves what it is like. We have to break that order altogether, and by picking out from it the items that concern us, and connecting them with others far away, which we say 'belong' with them, we are able to make out definite threads of sequence and tendency, to foresee particular liabilities and get ready for them, to enjoy simplicity and harmony in the place of what was chaos. Is not the sum of your actual experience taken at this moment and impartially added together an utter chaos? The strains of my voice, the lights and shades inside the room and out, the murmur of the wind, the ticking of the clock, the various organic feelings you may happen individually to possess, do these make a whole at all? Is it not the only condition of your mental sanity in the midst of them that most of them should become non-existent for you, and that a few others—the sounds, I hope, which I am uttering—should evoke from places in your memory, that have nothing to do with this scene, associates fitted to combine with them in what we call a rational train of thought?—rational because it leads to a conclusion we have some organ to appreciate. We have no organ or faculty to appreciate the simply given order. The real world as it is given at this moment is the sum total of all its beings and events now. But can we think of such a sum? Can we realize for an instant what a cross-section of all existence at a definite point of time would be? While I talk and the flies buzz, a sea gull catches a fish at the mouth of the Amazon, a tree falls in the Adirondack wilderness, a man sneezes in Germany, a horse dies in Tartary, and twins are born in France. What does that mean? Does the contemporaneity of these events with each other and with a million more as disjointed as they form a rational bond between them, and unite them into anything that means for us a world? Yet just such a collateral contemporaneity, and nothing else, is the *real* order of the world. It is an order with which we have nothing to do but to get away from it as fast as possible. As I said, we break it: we break it into histories, and we break it into arts, and we break it into sciences; and then we begin to feel at home. We make ten thousand separate serial orders of it. On any one of these, we may react as if the rest did not exist. We discover among its parts relations that were never given to sense at all,—mathematical relations, tangents, squares, and roots and logarithmic functions,—and out of an infinite number of these we call certain ones essential and lawgiving, and ignore the rest. Essential these relations are, but only *for our purpose*, the other relations being just as real and present as they; and our purpose is to *conceive simply* and to *foresee*. Are not simple conception and prevision subjective ends, pure and simple? They are the ends of what we call science; and the miracle of miracles, a miracle not yet exhaustively cleared up by any philosophy, is that the given order lends itself to the remodelling. It shows itself plastic to many of our scientific, to many of our æsthetic, to many of our practical purposes and ends." Cf. also Hodgson: *Philos. of Refl.*, ch. v; Lotze: *Logik*, §§ 342-351; Sigwart: *Logik*, §§ 60-63, 105.

[533] In an article entitled 'Great Men, Great Thoughts, and the Environment,' published in the *Atlantic Monthly* for October 1880, the reader will find some ampler illustrations of these remarks. I have there tried to show that both mental and social evolution are to be conceived after the Darwinian

fashion, and that the function of the environment properly so called is much more that of *selecting* forms, produced by invisible forces, than *producing* of such forms,—producing being the only function thought of by the pre-Darwinian evolutionists, and the only one on which stress is laid by such contemporary ones as Mr. Spencer and Mr. Allen.

[534] "It is perfectly true that our world of experience begins with such associations as lead us to expect that what has happened to us will happen again. These associations lead the babe to look for milk from its nurse and not from its father, the child to believe that the apple he sees will taste good; and whilst they make him wish for it, they make him fear the bottle which contains his bitter medicine. But whereas a part of these associations grows confirmed by frequent repetition, another part is destroyed by contradictory experiences; and the world becomes divided for us into two provinces, one in which we are at home and anticipate with confidence always the same sequences; another filled with alternating, variable, accidental occurrences....

"Accident is, in a wide sphere, such an every-day matter that we need not be surprised if it sometimes invades the territory where order is the rule. And one personification or another of the capricious power of chance easily helps us over the difficulties which further reflection might find in the exceptions. Yes, indeed, Exception has a peculiar fascination; it is a subject of astonishment, a θαῦμα, and the credulity with which in this first stage of pure association we adopt our supposed rules is matched by the equal credulity with which we adopt the miracles that interfere with them.

"The whole history of popular beliefs about nature refutes the notion that the thought of an universal physical order can possibly have arisen through the purely passive reception and association of particular perceptions. Indubitable as it is that all men infer from known cases to unknown, it is equally certain that this procedure, if restricted to the phenomenal materials that spontaneously offer themselves, would never have led to the belief in a general uniformity, but only to the belief that law and lawlessness rule the world in motley alternation. From the point of view of strict empiricism nothing exists but the sum of particular perceptions with their coincidences on the one hand, their contradictions on the other.

"That there is more order in the world than appears at first sight is not discovered till the order is looked for. The first impulse to look for it proceeds from practical needs: where ends must be attained, we must know trustworthy means which infallibly possess a property or produce a result. But the practical need is only the first occasion for our reflection on the conditions of a true knowledge; even were there no such need, motives would still be present to carry us beyond the stage of mere association. For not with an equal interest, or rather with an equal lack of interest, does man contemplate those natural processes in which like is joined to like, and those in which like and unlike are joined; the former processes harmonize with the conditions of his thinking, the latter do not; in the former his concepts, judgments, inferences apply to realities, in the latter they have no such application. And thus the intellectual satisfaction which at first comes to him without reflection, at last excites in him the conscious wish to find realized throughout the entire phenomenal world those rational continuities, uniformities, and necessities which are the fundamental element and guiding principle of his own thought." (C. Sigwart: Logik, ii. 380-2.)

[535] Cf. Hodgson: Philosophy of Reflection, book ii, chap. v.

[536] The aspiration to be 'scientific' is such an idol of the tribe to the present generation, is so sucked in with his mother's milk by every one of us, that we find it hard to conceive of a creature who should not feel it, and harder still to treat it freely as the altogether peculiar and one-sided subjective interest which it is. But as a matter of fact, few even of the cultivated members of the race have shared it; it was invented but a generation or two ago. In the middle ages it meant only impious magic; and the way in which it even now strikes orientals is charmingly shown in the letter of a Turkish *cadi* to an English traveller asking him for statistical information, which Sir A. Bayard prints

at the end of his 'Nineveh and Babylon.' The document is too full of edification not to be given in full. It runs thus:

"My Illustrious Friend, and Joy of my Liver!

"The thing you ask of me is both difficult and useless. Although I have passed all my days in this place, I have neither counted the houses nor inquired into the number of the inhabitants; and as to what one person loads on his mules and the other stows away in the bottom of his ship, that is no business of mine. But, above all, as to the previous history of this city, God only knows the amount of dirt and confusion that the infidels may have eaten before the coming of the sword of Islam. It were unprofitable for us to inquire into it.

"O my soul! O my lamb! seek not after the things which concern thee not. Thou camest unto us and we welcomed thee: go in peace.

"Of a truth thou hast spoken many words; and there is no harm done, or the speaker is one and the listener is another. After the fashion of thy people thou hast wandered from one place to another, until thou art happy and content in none. We (praise be to God) were born here, and never desire to quit it. Is it possible, then, that the idea of a general intercourse between mankind should make any impression on our understandings? God forbid!

"Listen, O my son! There is no wisdom equal unto the belief in God! He created the world, and shall we liken ourselves unto Him in seeking to penetrate into the mysteries of His creation? Shall we say, Behold this star spinneth round that star, and this other star with a tail goeth and cometh in so many years! Let it go! He from whose hand it came will guide and direct it.

"But thou wilt say unto me, Stand aside, O man, for I am more learned than thou art, and have seen more things. If thou thinkest that thou art in this respect better than I am, thou art welcome. I praise God that I seek not that which I require not. Thou art learned in the things I care not for; and as for that which thou hast seen, I spit upon it. Will much knowledge create thee a double belly, or wilt thou seek Paradise with thine eyes?

"O my friend! if thou wilt be happy, say, There is no God but God! Do no evil, and thus wilt thou fear neither man nor death: for surely thine hour will come!

"The meek in spirit (El Fakir)

"*IMAUM ALI ZADI.*"

[537] "Though a man in a fever should from sugar have a bitter taste which at another time would produce a sweet one, yet the idea of bitter in that man's mind would be as clear and distinct from the idea of sweet as if he had tasted only gall. Nor does it make any more confusion between the two ideas of sweet and bitter that the same sort of body produces at one time one and at another time another idea by the taste, than it makes a confusion in two ideas of white and sweet, or white and round, that the same piece of sugar produces them both in the mind at the same time." Locke's Essay, bk. ii. ch. xi. § 3.

[538] Cf. Bradley, Logic, p. 226.

[539] This apprehension of them as forming a single system is what Mr. Bradley means by the act of *construction* which underlies all reasoning. The awareness, which then supervenes, of the additional relation of which I speak in the next paragraph of my text, is what this author calls the act of *inspection*. Cf. Principles of Logic, bk. ii. pt. i. chap. iii.

[540] Realities fall under this only so far as they prove to *be* the same. So far as they cannot be substituted for each other, for the purpose in hand, so far they are not the same; though for other

purposes and in other respects they might be substituted, and then be treated as the same. Apart from purpose, of course, no realities ever are absolutely and exactly the same.

[541] A mind, in other words, which has got *beyond* the merely *dichotomic* style of thought which Wundt alleges to be the essential form of human thinking (Physiol. Psych., ii. 312).

[542] Said to be expressed by Grassman in the fundamental Axiom of Arithmetic $(a + b) + 1 = a + (b + 1)$.

[543] Compare Helmholtz's more technically expressed Essay Zählen u. Messen, in the Philosophische Aufsätze, Ed. Zeller gewidmet (Leipzig, 1887), p. 17.

[544] For the original statements, cf. J. S. Mill's Logic, bk. ii. chap. vi. §§ 2, 3; and bk. iii. chap. xxiv. § 5.

[545] The subdivision itself consumes none of the space. In all practical experience our subdivisions do consume space. They consume it in our geometrical figures. But for simplicity's sake, in geometry we postulate subdivisions which violate experience and consume none of it.

[546] Cf. A. de Morgan: Syllabus of a proposed System of Logic (1860), pp. 46-56.

[547] Cf. Locke's Essay, bk. ii. chap. xvii. § 6.

[548] Some readers may expect me to plunge into the old debate as to whether the *a priori* truths are 'analytic' or 'synthetic.' It seems to me that the distinction is one of Kant's most unhappy legacies, for the reason that it is impossible to make it sharp. No one will say that such analytic judgments as "equidistant lines can nowhere meet" are *pure* tautologies. The predicate is a somewhat new way of conceiving as well as of naming the subject. There is *something* 'ampliative' in our greatest truisms, our state of mind is richer after than before we have uttered them. This being the case, the question "at what point does the new state of mind cease to be *implicit* in the old?" is too vague to be answered. The only sharp way of defining synthetic propositions would be to say that they express a relation between *two data* at least. But it is hard to find any proposition which cannot be construed as doing this. Even verbal definitions do it. Such painstaking attempts as that latest one by Mr. D. G. Thompson to prove all necessary judgments to be analytic (System of Psychology, ii. pp. 232 ff.) seem accordingly but *nugæ difficiles*, and little better than wastes of ink and paper. All philosophic interest vanishes from the question, the moment one ceases to ascribe to *any a priori* truths (whether analytic or synthetic) that "legislative character for all possible experience" which Kant believed in. We ourselves have denied such legislative character, and contended that it was for experience itself to prove whether its data can or cannot be assimilated to those ideal terms between which *a priori* relations obtain. The analytic-synthetic debate is thus for us devoid of all significance. On the whole, the best recent treatment of the question known to me is in one of A. Spir's works, his Denken und Wirklichkeit, I think, but I cannot now find the page.

[549] Book iv. chaps. ix. § 1; vii. 14.

[550] Chap. v. §§ 6, 8.

[551] Kant, by the way, made a strange tactical blunder in his way of showing that the forms of our necessary thought are underived from experience. He insisted on thought-forms with which experience largely *agrees*, forgetting that the only forms which could not by any possibility be the results of experience would be such as experience *violated*. The first thing a Kantian ought to do is to discover forms of judgment to which *no* order in 'things' runs parallel. These would indeed be features native to the mind. I owe this remark to Herr A. Spir, in whose 'Denken und Wirklichkeit' it is somewhere contained. I have myself already to some extent proceeded, and in the pages which follow shall proceed still farther, to show the originality of the mind's structure in this way.

[552] Yet even so late as Berkeley's time one could write: "As in reading other books a wise man will choose to fix his thoughts on the sense and apply it to use, rather than lay them out in grammatical remarks on the language: so in perusing the volume of nature methinks it is beneath the dignity of the mind to affect an exactness in reducing each particular phenomenon to general rules, or showing how it follows from them. We should propose to ourselves nobler views, namely, to recreate and exalt the mind with a prospect of the beauty, order, extent, and variety of natural things: hence, by proper inferences, to enlarge our notions of the grandeur, wisdom, and beneficence of the Creator," etc., etc., etc. (Principles of Human Knowledge, § 109.)

[553] Die Erhaltung der Kraft (1847), pp. 2-6.

[554] Perhaps the most influential of all these postulates is that the nature of the world must be such that sweeping statements may be made about it.

[555] Consider, e.g., the use of the axioms '*nemo potest supra seipsum*,' and '*nemo dat quod non habet*,' in this refutation of 'Darwinism,' which I take from the much-used scholastic compendium of Logic and Metaphysics of Liberatore, 3d ed. (Rome, 1880): "Hæc hypothesis... aperte contradicit principiis Metaphysicæ, quæ docent essentias rerum esse immutabiles, et effectum non posse superare causam. Et sane, quando, juxta Darwin, species inferior se evolvit in superiorem, unde trahit maiorem illam nobilitatem? Ex ejus carentia. At nihil dat quod non habet; et minus gignere nequit plus, aut negatio positionem. Præterea in transformatione quæ fingitur, nature prioris speciei, servatur aut destruitur? Si primum, mutatio erit tantum accidentalis, qualem reapse videmus in diversis stirpibus animantium. Sin alterum asseritur, ut reapse fert hypothesis darwiniana, res tenderet ad seipsam destruendam; cum contra omnia naturaliter tendant ad sui conservationem, et nonnisi per actionem contrarii agentis corruant." It is merely a question of fact whether these ideally proper relations do or do not obtain between animal and vegetable ancestors and descendants. If they do not, what happens? simply this, that we cannot continue to class animal and vegetal facts under the *kinds* between which those ideal relations obtain. Thus, we can no longer call animal breeds by the name of 'species'; cannot call generating a kind of 'giving,' or treat a descendant as an 'effect' of his ancestor. The ideal scheme of terms and relations can remain, if you like; but it must remain purely mental, and without application to life, which 'gangs its ain gait' regardless of ideal schemes. Most of us, however, would prefer to doubt whether such abstract axioms as that 'a thing cannot tend to its own destruction' express ideal relations of an important sort at all.

[556] Compare A. Riehl: Der Philosophische Criticismus, Bd. ii. Thl. i Abschn. i. Cap. iii. § 6.

[557] As one example out of a thousand of exceptionally delicate idiosyncrasy in this regard, take this: "I must quit society. I would rather undergo twice the danger from beasts and ten times the danger from rocks. It is not pain, it is not death, that I dread,—it is the hatred of a man; there is something in it so shocking that I would rather submit to any injury than incur or increase the hatred of a man by revenging it.... Another sufficient reason for suicide is that I was this morning out of temper with Mrs. Douglas (for no fault of hers). I did not betray myself in the least, but I reflected that to be exposed to the possibility of such an event once a year, was evil enough to render life intolerable. The disgrace of using an impatient word is to me overpowering." (Elton Hammond, quoted in Henry Crabb Robinson's Diary, vol. i. p. 424.)

[558] Compare H. Sidgwick, Methods of Ethics, bk. iii. chap. xiii. § 3.

[559] A gentleman told me that he had a conclusive argument for opening the Harvard Medical School to women. It was this: "Are not women human?"—Which major premise of course had to be granted. "Then are they not entitled to all the rights of humanity?" My friend said that he had never met anyone who could successfully meet this reasoning.

[560] You reach the Mephistophelian point of view as well as the point of view of justice by treating cases as if they belonged rigorously to abstract classes. Pure rationalism, complete immunity from prejudice, consists in refusing to see that the case before one is absolutely unique. It is always possible to treat the country of one's nativity, the house of one's fathers, the bed in which one's mother died, nay, the mother herself if need be, on a naked equality with all other specimens of so many respective genera. It shows the world in a clear frosty light from which all fuliginous mists of affection, all swamp-lights of sentimentality, are absent. Straight and immediate action becomes easy then—witness a Napoleon's or a Frederick's career. But the question always remains, "Are not the mists and vapors *worth* retaining?" The illogical refusal to treat certain concretes by the mere law of their genus has made the drama of human history. The obstinate insisting that tweedledum is *not*

tweedledee is the bone and marrow of life. Look at the Jews and the Scots, with their miserable factions and sectarian disputes, their loyalties and patriotisms and exclusions,—their annals now become a classic heritage, because men of genius took part and sang in them. A thing is important if any one *think* it important. The process of history consists in certain folks becoming possessed of the mania that certain special things are important infinitely, whilst other folks cannot agree in the belief. The Shah of Persia refused to be taken to the Derby Day, saying "It is already known to me that one horse can run faster than another." He made the question "*which* horse?" immaterial. Any question can be made immaterial by subsuming all its answers under a common head. Imagine what college ball-games and races would be if the teams were to forget the absolute distinctness of Harvard from Yale and think of both as One in the higher genus College. The sovereign road to indifference, whether to evils or to goods, lies in the thought of the higher genus. "When we have meat before us," says Marcus Aurelius, seeking indifference to *that* kind of good, "we must receive the impression that this is the dead body of a fish, and this is the dead body of a bird or of a pig; and again that this Falernian is only a little grape-juice, and this purple robe some sheep's wool dyed with the blood of a shell-fish. Such, then, are these impressions, and they reach the things themselves and penetrate them, and we see what kind of things they are. Just in the same way ought we to act through life, and where there are things which appear most worthy of our approbation, we ought to lay them bare and look at their worthlessness and strip them of all the words by which they are exalted." (Long's Translation, vi. 13.)

[561] "*An sich, in seinem eignen Wesen, ist jedes reale Object mit sich selbst identisch und unbedingt*"—that is, the "*allgemeinste Einsicht a priori*" and the "*allgemeinste aus Erfahrung*" is "*Alles erkennbare ist bedingt*." (A. Spir: Denken und Wirklichkeit. Compare also Herbart and Hegel.)

[562] Philosophie Zoölogique, 3me partie, chap. v., 'de l'Instinct.'

[563] It should be said that Mr. Spencer's most formal utterance about instinct is in his Principles of Psychology, in the chapter under that name. Dr. Romanes has reformulated and criticised the doctrine of this chapter in his Mental Evolution in Animals, chapter xvii. I must confess my inability to state its vagueness in intelligible terms. It treats instincts as a further development of reflex actions, and as forerunners of intelligence,—which is probably true of many. But when it ascribes their formation to the mere 'multiplication of experiences,' which, at first simple, mould the nervous system to 'correspond to outer relations' by simple reflex actions, and, afterwards complex, make it 'correspond' by 'compound reflex actions,' it becomes too mysterious to follow without more of a key than is given. The whole thing becomes perfectly simple if we suppose the reflex actions to be accidental inborn idiosyncrasies preserved.

[564] This account of acquisitiveness differs from our own. Without denying the associationist account to be a true description of a great deal of our proprietary feeling, we admitted in addition an entirely primitive form of desire. (See above, p. 420 ff.) The reader must decide as to the plausibilities of the case. Certainly appearances are in favor of there being in us *some* cupidities quite disconnected with the ulterior uses of the things appropriated. The source of their fascination lies in their appeal to our æsthetic sense, and we wish thereupon simply to *own* them. Glittering, hard, metallic, odd, pretty things; curious things especially; natural objects that look as if they were artificial, or that mimic other objects,—these form a class of things which human beings snatch at as magpies snatch rags. They simply fascinate us. What house does not contain some drawer or cupboard full of senseless odds and ends of this sort, with which nobody knows what to do, but which a blind instinct saves from the ash-barrel? Witness people returning from a walk on the seashore or in the woods, each carrying some *lusus naturæ* in the shape of stone or shell, or strip of bark or odd-shaped fungus, which litter the house and grow daily more unsightly, until at last reason triumphs over blind propensity and sweeps them away.

[565] Review of Bain in H. Spencer: Illustrations of Universal Progress (New York, 1864), pp. 311, 315.

[566] Ribot: De l'Herédité, 2me éd. p. 26.

[567] Quoted (without reference) in Spencer's Biology, vol. i. p. 247.

[568] Expression of Emotions (N. Y.), p. 287.

[569] 'Adaptive' changes are those produced by the direct effect of outward conditions on an organ or organism. Sunburned complexion, horny hands, muscular toughness, are illustrations.

[570] For these and other facts cf. Th. Ribot: De l'Hérédité; W. B. Carpenter: Contemporary Review, vol. 21, p. 295, 779, 867; H. Spencer: Princ. of Biol. pt. ii. ch. v, viii, ix, x; pt. iii. ch. xi, xii; C. Darwin: Animals and Plants under Domestication, ch. xii, xiii. xiv; Sam'l Butler: Life and Habit; T. A. Knight: Philos. Trans. 1837; E. Dupuy: Popular Science Monthly, vol. xi. p. 332; F. Papillon: Nature and Life, p. 330; Crothers, in Pop. Sci. M., Jan. (or Feb.) 1889.

[571] [Because, being exhibited by neuter insects, the effects of mere practice cannot accumulate from one generation to another.—W. J.]

[572] Origin of Species, chap. vii.

[573] Princ. of Psychol., ii. 561.

[574] *Ibid.* p. 263.

[575] Ueber die Vererbung (Jena, 1883). Prof. Weismann's Essays on Heredity have recently (1889) been published in English in a collected form.

[576] Best expressed in the Essay on the *Continuitat des Keimplasmas* (1885).

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COLLECTED PAPERS
OF
ANALYTICAL PSYCHOLOGY

C.G. JUNG

SECOND EDITION

Project Gutenberg's Collected Papers on Analytical Psychology, by C. G. Jung

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COLLECTED PAPERS

ON

ANALYTICAL PSYCHOLOGY

BY

C. G. JUNG, M.D., LL.D.,

FORMERLY OF THE UNIVERSITY OF ZÜRICH.

AUTHORISED TRANSLATION

EDITED BY DR. CONSTANCE E. LONG,

**MEDICAL OFFICER, EDUCATION BOARD; MEMBER ADVISORY COMMITTEE
INSURANCE ACT;
EX-PRESIDENT ASSOCIATION OF REGISTERED MEDICAL WOMEN, ETC.**

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EDITOR'S PREFACE TO SECOND EDITION

The following papers have been gathered together from various sources, and are now available for the first time to English readers. The subject of psychoanalysis is much in evidence, and is likely to occupy still more attention in the near future, as the psychological content of the psychoses and neuroses is more generally appreciated and understood. It is of importance, therefore, that the fundamental writings of both the Viennese and Zürich Schools should be accessible for study. Several of Freud's works have already been translated into English. Dr. Jung's "Wandlungen und Symbole der Libido" was published in America in 1916 under the title of "The Psychology of the Unconscious." That work, read in conjunction with these papers, offers a fairly complete picture of the scientific and philosophic standpoint of the leader of the Zürich School. It is the task of the future to judge and expand the findings of both schools, and to work at the development of the new psychology, which is still in its infancy.

It will be a relief to many students of the unconscious to see it in another aspect than that of "a wild beast couched, waiting its hour to spring." Some readers have gathered that view of it from the writings of the Viennese School, a view which is at most that dangerous thing "a half-truth."

In the papers appearing for the first time in this edition (Chapters XIV. and XV.), Dr. Jung develops his ideas of introversion and extroversion, a contribution of the first importance to psychology. He agrees with Freud in regarding the neuroses to be the result of repression, but differs in his view as to the origin of repression. He finds this to lie not in sexuality *per se*, but rather in man's natural tendency to adapt to the demands of life one-sidedly, according to his type of mentality. The born extrovert adapts by means of feeling, thought being under repression and relatively infantile. The introvert's natural adaptation is by means of thought; feeling being more or less repressed remains undeveloped. In either type the neglected co-function is behind the adapted function. This inequality operating in the unconscious, brings about a conflict, which in certain subjects amounts to a neurosis, and in others produces a limitation of individual development. This view shifts the interpretation of repression on to a much more comprehensive basis than that of sexuality, although there can scarcely be a repression that does not include this instinct on account of its deep and far-reaching importance in man.

There is no doubt that some even scientific persons have a certain fear of whither the study of the unconscious may lead. These fearful persons should be reminded that they possess an unconscious in spite of themselves, and that they share it in common with every human being. It is an extension of the individual. To study it is to deepen the self. All new discoveries have at one stage been called dangerous, and all new philosophies have been deemed heresies. It is as though we would once more consign radium to its dust-heaps, lest some day the new radiance should over-power mankind. Indeed this particular thing has proved at once most dangerous and most precious. Man must learn to use his treasure, and in using it to *submit to its own laws*, which can only become known when it is handled and investigated.

Those who read this book with the attention it requires, will find they gain an impression of many new truths. The second edition is issued towards the end of the third year of the Great European war, at a time when much we have valued and held sacred is in the melting-pot. But we believe that out of the crucible new forms will arise. The study of psychoanalysis produces something of

the effect of a war in the psyche; indeed, we need to make conscious this war in the inner things of the mind and soul if we would be delivered in the future from war in the external world. There is a parallelism between individual and international neurosis. In the pain of the upheaval, one recognises the birth-pangs of newer, and let us hope, truer thought, and more natural adaptations. We need a renewal of our philosophy of life to replace much that has perished in the general cataclysm, and it is because I see in the analytical psychology, which grows out of a scientific study of the unconscious, the germs of such a new construction, that I have gathered the following essays together. The translation is the work of various hands, the names of the different translators being given in a footnote at the beginning of each essay; for the editing I am responsible. The essays are, as far as possible, printed in chronological order, and those readers who are sufficiently interested will be able to discern in them the gradual development of Dr. Jung's present position in psychoanalysis.

CONSTANCE E. LONG.

2, HARLEY PLACE, W.
June, 1917.

AUTHOR'S PREFACE TO SECOND EDITION

In agreement with my honoured collaborator, Dr. C. E. Long, I have made certain additions to the second edition. It should especially be mentioned that a new chapter upon "The Concept of the Unconscious" has been added. This is a lecture I gave early in 1916 before the Zürich Union for Analytical Psychology. It gives a general orientation of a most important problem in practical analysis, viz. of the relation of the psychological ego to the psychological non-ego. Chapter XIV. has been fundamentally altered, and I have used the opportunity to incorporate an article that should describe the results of more recent researches. In accordance with my usual mode of working, the description is as generalised as possible. My habit in my daily practical work is to confine myself for some time to studying my human material. I then abstract as generalised a formula as possible from the data collected, obtaining from it a point of view and applying it in my practical work, until it has either been confirmed, modified, or else abandoned. If it has been confirmed, I publish it as a general view-point, without giving the empirical material. I only introduce the material amassed in the course of my practice in the form of example or illustration. I therefore beg the reader not to consider the views I present as mere fabrications of my brain. They are, as a matter of fact, the results of extensive experience and ripe reflection.

These additions will enable the reader of the second edition to become familiar with the recent views of the Zürich School.

As regards the criticism encountered by the first edition of this work, I was pleased to find my writings were received with much more open-mindedness among English critics than was the case in Germany, where they are met with the silence born of contempt. I am particularly grateful to Dr. Agnes Savill for an exceptionally understanding criticism in the *Medical Press*. My thanks are also due to Dr. T. W. Mitchell for an exhaustive review in the *Proceedings of the Society for Psychical Research*. This critic takes exception to my heresy respecting causality. He considers that I am entering upon a perilous, because unscientific, course, when I question the sole validity of the causal view-point in psychology. I sympathise with him, but in my opinion the nature of the human mind compels us to take the final point of view. For it cannot be disputed that, psychologically speaking, we are living and working, day by day, according to the principle of directed aim or purpose, as well as that of causality. A psychological theory must necessarily adapt itself to this fact. What is plainly directed towards a goal cannot be given an exclusively causalistic explanation, otherwise we should be led to the conclusion expressed in Moleschott's famous enunciation: "Man *is*, what he eats." We must always bear the fact in mind that *causality is a point of view*. It affirms the inevitable and immutable relation of a series of events: a-b-d-z. Since this relation is fixed, and according to the view-point must necessarily be so, looked at logically the order may also be reversed. *Finality is also a view-point*, that is justified empirically solely by the existence of series of events, wherein the causal connection is indeed evident, *but the meaning of which only becomes intelligible as producing final effect*. Ordinary daily life furnishes the best instances of this. The causal explanation must be mechanistic, if we are not to postulate a metaphysical entity as first cause. For instance, if we adopt Freud's sexual theory and assign primary importance psychologically to the function of the genital glands, the brain is viewed as an appendage of the genital glands. If we approach the Viennese idea of sexuality with all its vague omnipotence, and trace it in a strictly scientific manner down to its psychological basis, we shall

arrive at the first cause, according to which psychic life is for the most, or the most important part, tension and relaxation of the genital glands. If we assume for the moment that this mechanistic explanation be "true," it would be the sort of truth which is exceptionally tiresome and rigidly limited in scope. A similar statement would be that the genital glands cannot function without adequate *nourishment*, with its inference that sexuality is an appendage-function of nutrition! The truth contained in this is really an important chapter in the biology of lower forms of life.

But if we wish to work in a really psychological way, we shall want to know the *meaning* of psychological phenomena. After learning the kinds of steel the various parts of a locomotive are made of, and from what ironworks and mines they come, we do not really know anything about the locomotive's *function*, that is to say, its *meaning*. But "function" as conceived by modern science is by no means solely a causal concept; it is especially a final or "teleological" one. For it is utterly impossible to consider the soul from the causal view-point only; we are obliged to consider it also from the final point of view. As Dr. Mitchell also points out, it is impossible for us to think of the causal determination conjointly with a final connection. That would be an obvious contradiction. But our theory of cognition does not need to remain on a pre-Kantian level. It is well known that Kant showed very clearly that the mechanistic and the teleological view-points are not *constituent* (objective) principles, in some degree qualities of the object, but that they are purely *regulative* (subjective) principles of thought, and as such they are not mutually inconsistent. I can, for example, easily conceive the following thesis and antithesis:—

Thesis: Everything came into existence according to mechanistic laws.

Antithesis: Some things did not come into existence according to mechanistic laws only.

Kant says to this: Reason cannot prove either of these principles, because *a priori* purely empirical laws of nature cannot give us a determinative principle regarding the potentiality of things.

As a matter of fact, modern physics has necessarily been converted from the idea of pure mechanism to the final concept of the conservation of energy, because the mechanistic explanation only recognises reversible processes, whereas the actual truth is that the process of nature is irreversible. This fact led to the concept of an energy that tends towards relief of tension, and therewith also towards a definite final state.

Obviously, I consider both these points of view necessary, the causal as well as the final, but would at the same time lay stress upon the fact that since Kant's time we have come to know that the two view-points are not antagonistic if they are regarded as regulative principles of thought, and not as constituent principles of the process of nature itself.

When speaking of the reviews, I must also mention those that seem to me beside the mark. I was once more struck by the fact that certain critics cannot distinguish between the theoretical explanation given by the author, and the phantastic ideas provided by the patient. One of my critics makes this confusion when discussing "Number Dreams." The associations to the quotation from the Bible in Chapter V. are, as every attentive reader must readily perceive, not arbitrary explanations of my own, but a cryptomnesic conglomeration emanating, not from my brain at all, but from that of the patient. Surely it is not difficult to perceive upon reflection that this conglomeration of numbers corresponds exactly to that unconscious psychological function from which proceeded all the mysticism of numbers, Pythagoric, Kabbalistic, and so forth, existent from untold ages.

I am grateful to my serious reviewers, and should like here to also express my thanks to Mrs. Harold F. McCormick for her generous help in the production of this book.

C. G. JUNG.

June, 1917.

AUTHOR'S PREFACE TO FIRST EDITION

This volume contains a selection of articles and pamphlets on analytical psychology written at intervals during the past fourteen years. These years have seen the development of a new discipline, and as is usual in such a case, have involved many changes of view-point, of concept, and of formulation.

It is not my intention to give a presentation of the fundamental concepts of analytical psychology in this book; it throws some light, however, on a certain line of development which is especially characteristic of the Zürich School of psychoanalysis.

As is well known, the merit of the discovery of the new analytical method of general psychology belongs to Professor Freud of Vienna. His original view-points had to undergo many essential modifications, some of them owing to the work done at Zürich, in spite of the fact that he himself is far from agreeing with the standpoint of this school.

I am unable to explain fully the fundamental differences between the two schools, but would indicate the following points: The Vienna School takes the standpoint of an exclusive sexualistic conception, while that of the Zürich School is symbolistic. The Vienna School interprets the psychological symbol semiotically, as a sign or token of certain primitive psychosexual processes. Its method is analytical and causal.

The Zürich School recognises the scientific feasibility of such a conception, but denies its exclusive validity, for it does not interpret the psychological symbol semiotically only, but also symbolistically, that is, it attributes a positive value to the symbol.

The value does not depend merely on historical causes; its chief importance lies in the fact that it has a meaning for the actual present, and for the future, in their psychological aspects. For to the Zürich School the symbol is not merely a sign of something repressed and concealed, but is at the same time an attempt to comprehend and to point out the way of the further psychological development of the individual. Thus we add a prospective import to the retrospective value of the symbol.

The method of the Zürich School is therefore not only analytical and causal, but also synthetic and prospective, in recognition that the human mind is characterised by "causæ" and also by "fines" (aims). The latter fact needs particular emphasis, because there are two types of psychology, the one following the principle of hedonism, and the other following the principle of power. Scientific materialism is pertinent to the former type, and the philosophy of Nietzsche to the latter. The principle of the Freudian theory is hedonism, while that of Adler (one of Freud's earliest personal pupils) is founded upon the principle of power.

The Zürich School, recognising the existence of these two types (also remarked by the late Professor William James), considers that the views of Freud and Adler are one-sided, and only valid within the limits of their corresponding type. Both principles exist within every individual, but not in equal proportions.

Thus, it is obvious that each psychological symbol has two aspects, and should be interpreted according to the two principles. Freud and Adler interpret in the analytical and causal way,

reducing to the infantile and primitive. Thus with Freud the conception of the "aim" is the fulfilment of desire, with Adler it is the usurpation of power. Both authors take the standpoint in their practical analytical work which brings to view only infantile and gross egoistic aims.

The Zürich School is convinced of the fact that within the limits of a diseased mental attitude the psychology is such as Freud and Adler describe. It is, indeed, just on account of such impossible and childish psychology that the individual is in a state of inward dissociation and hence neurotic. The Zürich School, therefore, in agreement with them so far, also reduces the psychological symbol (the phantasy products of the patient) to the fundamental infantile hedonism, or to the infantile desire for power. But Freud and Adler content themselves with the result of mere reduction, according to their scientific biologism and naturalism.

But here a very important question arises. Can man obey the fundamental and primitive impulses of his nature without gravely injuring himself or his fellow beings? He cannot assert either his sexual desire or his desire for power unlimitedly, and the limits are moreover very restricted. The Zürich School has in view also the final result of analysis, and regards the fundamental thoughts and impulses of the unconscious, as symbols, indicative of a definite line of future development. We must admit there is, however, *no scientific justification* for such a procedure, because our present-day science is based as a whole upon causality. But causality is only one principle, and psychology essentially cannot be exhausted by causal methods only, because the mind lives by aims as well. Besides this disputable philosophical argument, we have another of much greater value in favour of our hypothesis, namely, that of *vital necessity*. It is impossible to live according to the intimations of infantile hedonism, or according to a childish desire for power. If these are to be retained they must be taken symbolically. Out of the symbolic application of infantile trends, an attitude evolves which may be termed philosophic or religious, and these terms characterise sufficiently the lines of further development of the individual. The individual is not only an established and unchangeable complex of psychological facts, but also an extremely changeable entity. By exclusive reduction to causes, the primitive trends of a personality are reinforced; this is only helpful when at the same time these primitive tendencies are balanced by recognition of their symbolic value. Analysis and reduction lead to causal truth; this by itself does not help living, but brings about resignation and hopelessness. On the other hand, the recognition of the intrinsic value of a symbol leads to constructive truth and helps us to live. It induces hopefulness and furthers the possibility of future development.

The functional importance of the symbol is clearly shown in the history of civilisation. For thousands of years the religious symbol proved a most efficacious means in the moral education of mankind. Only a prejudiced mind could deny such an obvious fact. Concrete values cannot take the place of the symbol; only new and more efficient symbols can be substituted for those that are antiquated and outworn, such as have lost their efficacy through the progress of intellectual analysis and understanding. The further development of mankind can only be brought about by means of symbols which represent something far in advance of himself, and whose intellectual meanings cannot yet be grasped entirely. The individual unconscious produces such symbols, and they are of the greatest possible value in the moral development of the personality.

Man almost invariably has philosophic and religious views of the meaning of the world and of his own life. There are some who are proud to have none. These are exceptions outside the common path of mankind; they miss an important function which has proved itself to be indispensable to the human mind.

In such cases we find in the unconscious, instead of modern symbolism, an antiquated archaic view of the world and of life. If a requisite psychological function is not represented in the sphere of consciousness, it exists in the unconscious in the form of an archaic or embryonic prototype.

This brief *résumé* may show what the reader cannot find in this collection of papers. The essays are stations on the way of the more general views developed above.

C. G. JUNG.

ZÜRICH,

. *January, 1916.*

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ANALYTICAL PSYCHOLOGY

CHAPTER I

ON THE PSYCHOLOGY AND PATHOLOGY OF SO-CALLED OCCULT PHENOMENA^[1]

In that wide field of psychopathic deficiency where Science has demarcated the diseases of epilepsy, hysteria and neurasthenia, we meet scattered observations concerning certain rare states of consciousness as to whose meaning authors are not yet agreed. These observations spring up sporadically in the literature on narcolepsy, lethargy, *automatisme ambulatoire*, periodic amnesia, double consciousness, somnambulism, pathological dreamy states, pathological lying, etc.

These states are sometimes attributed to epilepsy, sometimes to hysteria, sometimes to exhaustion of the nervous system, or neurasthenia, sometimes they are allowed all the dignity of a disease *sui generis*. Patients occasionally work through a whole graduated scale of diagnoses, from epilepsy, through hysteria, up to simulation. In practice, on the one hand, these conditions can only be separated with great difficulty from the so-called neuroses, sometimes even are indistinguishable from them; on the other, certain features in the region of pathological deficiency present more than a mere analogical relationship not only with phenomena of normal psychology, but also with the psychology of the supernormal, of genius. Various as are the individual phenomena in this region, there is certainly no case that cannot be connected by some intermediate example with the other typical cases. This relationship in the pictures presented by hysteria and epilepsy is very close. Recently the view has even been maintained that there is no clean-cut frontier between epilepsy and hysteria, and that a difference is only to be noted in extreme cases. Steffens says, for example^[2] —"We are forced to the conclusion that in essence hysteria and epilepsy are not fundamentally different, that the cause of the disease is the same, but is manifest in a diverse form, in different intensity and permanence."

The demarcation of hysteria and certain borderline cases of epilepsy from congenital and acquired psychopathic mental deficiency likewise presents the greatest difficulties. The symptoms of one or other disease everywhere invade the neighbouring realm, so violence is done to the facts when they are split off and considered as belonging to one or other realm. The demarcation of psychopathic mental deficiency from the normal is an absolutely impossible task, the difference is everywhere only "more or less." The classification in the region of mental deficiency itself is confronted by the same difficulty. At best, certain classes can be separated off which crystallise round some well-marked nucleus through having peculiarly typical features. Turning away from the two large groups of intellectual and emotional deficiency, there remain those deficiencies coloured pre-eminently by hysteria or epilepsy (epileptoid) or neurasthenia, which are not notably deficiency of the intellect or of feeling. It is essentially in this region, insusceptible of any absolute classification, that the above-named conditions play their part. As is well known, they can appear as part manifestations of a typical epilepsy or hysteria, or can exist separately in the realm of psychopathic mental deficiency, where their qualifications of epileptic or hysterical are often due to the non-essential accessory features. It is thus the rule to place somnambulism among hysterical diseases, because it is occasionally a phenomenon of severe hysteria, or because mild so-called hysterical symptoms may accompany it. Binet says: "Il n'y a pas une somnambulisme, état nerveux toujours identique à lui-même, il y a des somnambulismes." As one of the manifestations of a severe hysteria, somnambulism is not an unknown phenomenon, but as a pathological entity, as a disease *sui generis*, it must be somewhat rare, to judge by its infrequency in German literature on the subject. So-called spontaneous somnambulism, resting upon a foundation of hysterically-tinged psychopathic deficiency, is not a very common occurrence and it is worth while to devote closer study to these cases, for they occasionally present a mass of interesting particulars.

Case of Miss Elise K., aged 40, single; book-keeper in a large business; no hereditary taint, except that it is alleged a brother became slightly nervous after family misfortune and illness. Well educated, of a cheerful, joyous nature, not of a saving disposition, always occupied with some big idea. She was very kind-hearted and gentle, did a great deal both for her parents, who were living in very modest circumstances, and for strangers. Nevertheless

she was not happy, because she thought she did not understand herself. She had always enjoyed good health till a few years ago, when she is said to have been treated for dilatation of the stomach and tapeworm. During this illness her hair became rapidly white, later she had typhoid fever. An engagement was terminated by the death of her fiancé from paralysis. She had been very nervous for a year and a half. In the summer of 1897 she went away for change of air and treatment by hydropathy. She herself says that for about a year she has had moments during work when her thoughts seem to stand still, but she does not fall asleep. Nevertheless she makes no mistakes in the accounts at such times. She has often been to the wrong street and then suddenly noticed that she was not in the right place. She has had no giddiness or attacks of fainting. Formerly menstruation occurred regularly every four weeks, and without any pain, but since she has been nervous and overworked it has come every fourteen days. For a long time she has suffered from constant headache. As accountant and book-keeper in a large establishment, the patient has had very strenuous work, which she performs well and conscientiously. In addition to the strenuous character of her work, in the last year she had various new worries. Her brother was suddenly divorced. In addition to her own work, she looked after his housekeeping, nursed him and his child in a serious illness, and so on. To recuperate, she took a journey on the 13th September to see a woman friend in South Germany. The great joy at seeing her friend from whom she had been long separated, and her participation in some festivities, deprived her of her rest. On the 15th, she and her friend drank half a bottle of claret. This was contrary to her usual habit. They then went for a walk in a cemetery, where she began to tear up flowers and to scratch at the graves. She remembered absolutely nothing of this afterwards. On the 16th she remained with her friend without anything of importance happening. On the 17th her friend brought her to Zürich. An acquaintance came with her to the Asylum; on the way she spoke quite sensibly, but was very tired. Outside the Asylum they met three boys, whom she described as the "three dead people she had dug up." She then wanted to go to the neighbouring cemetery, but was persuaded to come to the Asylum.

She is small, delicately formed, slightly anæmic. The heart is slightly enlarged to the left, there are no murmurs, but some reduplication of the sounds, the mitral being markedly accentuated. The liver dulness reaches to the border of the ribs. Patella-reflex is somewhat increased, but otherwise

no tendon-reflexes. There is neither anæsthesia, analgesia, nor paralysis. Rough examination of the field of vision with the hands shows no contraction. The patient's hair is a very light yellow-white colour; on the whole she looks her age. She gives her history and tells recent events quite clearly, but has no recollection of what took place in the cemetery at C. or outside the Asylum. During the night of the 17th-18th she spoke to the attendant and declared she saw the whole room full of dead people—looking like skeletons. She was not at all frightened, but was rather surprised that the attendant did not see them too. Once she ran to the window, but was otherwise quiet. The next morning, while still in bed, she saw skeletons, but not in the afternoon. The following night at four o'clock she awoke and heard the dead children in the neighbouring cemetery cry out that they had been buried alive. She wanted to go out to dig them up, but allowed herself to be restrained. Next morning at seven o'clock she was still delirious, but recalled accurately the events in the cemetery at C. and those on approaching the Asylum. She stated that at C. she wanted to dig up the dead children who were calling her. She had only torn up the flowers to free the graves and to be able to get at them. In this state Professor Bleuler explained to her that later on, when in a normal state again, she would remember everything. The patient slept in the morning, afterwards was quite clear, and felt herself relatively well. She did indeed remember the attacks, but maintained a remarkable indifference towards them. The following nights, with the exception of those of the 22nd and the 25th September, she again had slight attacks of delirium, when once more she had to deal with the dead. The details of the attacks differed, however. Twice she saw the dead in her bed, but she did not appear to be afraid of them, she got out of bed frequently, however, because she did not want "to inconvenience the dead"; several times she wanted to leave the room.

After a few nights free from attacks there was a slight one on the 30th Sept., when she called the dead from the window. During the day her mind was clear. On the 3rd of October she saw a whole crowd of skeletons in the drawingroom, as she afterwards related, during full consciousness. Although she doubted the reality of the skeletons, she could not convince herself that it was a hallucination. The following night, between twelve and one o'clock—the earlier attacks were usually about this time—she was obsessed with the idea of dead people for about ten minutes. She sat up in bed, stared at a corner and said: "Well, come!—but they're not all there.

Come along! Why don't you come? The room is big enough, there's room for all; when all are there, I'll come too." Then she lay down with the words: "Now they're all there," and fell asleep again. In the morning she had not the slightest recollection of any of these attacks. Very short attacks occurred in the nights of the 4th, 6th, 9th, 13th and 15th of October, between twelve and one o'clock. The last three occurred during the menstrual period. The attendant spoke to her several times, showed her the lighted street-lamps, and trees; but she did not react to this conversation. Since then the attacks have altogether ceased. The patient has complained about a number of troubles which she had had all along. She suffered much from headache the morning after the attacks. She said it was unbearable. Five grains of Sacch. lactis promptly alleviated this; then she complained of pains in both fore-arms, which she described as if it were a teno-synovitis. She regarded the bulging of the muscles in flexion as a swelling, and asked to be massaged. Nothing could be seen objectively, and no attention being paid to it, the trouble disappeared. She complained exceedingly and for a long time about the thickening of a toenail, even after the thickened part had been removed. Sleep was often disturbed. She would not give her consent to be hypnotised for the night-attacks. Finally on account of headache and disturbed sleep she agreed to hypnotic treatment. She proved a good subject, and at the first sitting fell into deep sleep with analgesia and amnesia.

In November she was again asked whether she could now remember the attack on the 19th September which it had been suggested that she would recall. It gave her great trouble to recollect it, and in the end she could only state the chief facts, she had forgotten the details.

It should be added that the patient was not superstitious, and in her healthy days had never particularly interested herself in the supernatural. During the whole course of treatment, which ended on the 14th November, great indifference was evinced both to the illness and the cure. Next spring the patient returned for out-patient treatment of the headache, which had come back during the very hard work of these months. Apart from this symptom her condition left nothing to be desired. It was demonstrated that she had no remembrance of the attacks of the previous autumn, not even of those of the 19th September and earlier. On the other hand, in hypnosis she could

recount the proceedings in the cemetery and during the nightly disturbances.

By the peculiar hallucination and by its appearance our case recalls the conditions which V. Kraft-Ebing has described as "protracted states of hysterical delirium." He says: "Such conditions of delirium occur in the slighter cases of hysteria. Protracted hysterical delirium is built upon a foundation of temporary exhaustion. Excitement seems to determine an outbreak, and it readily recurs. Most frequently there is persecution-delirium with very violent anxiety, sometimes of a religious or erotic character. Hallucinations of all the senses are not rare, but illusions of sight, smell and feeling are the commonest, and most important. The visual hallucinations are especially visions of animals, pictures of corpses, phantastic processions in which dead persons, devils and ghosts swarm. The illusions of hearing are simply sounds (shrieks, howlings, claps of thunder) or local hallucinations, frequently with a sexual content."

This patient's visions of corpses, occurring almost always in attacks, recall the states occasionally seen in hystero-epilepsy. There likewise occur specific visions which, in contrast with protracted delirium, are connected with single attacks.

(1) A lady 30 years of age with *grande hystérie* had twilight states in which as a rule she was troubled by terrible hallucinations; she saw her children carried away from her, wild beasts eating them up, and so on. She has amnesia for the content of the individual attacks.^[3]

(2) A girl of 17, likewise a semi-hysteric, saw in her attacks the corpse of her dead mother approaching her to draw her to her. Patient has amnesia for the attacks.^[4]

These are cases of severe hysteria wherein consciousness rests upon a profound stage of dreaming. The nature of the attack and the stability of the hallucination alone show a certain kinship with our case, which in this respect has numerous analogies with the corresponding states of hysteria. For instance, with those cases where a psychical shock (rape, etc.) was the occasion for the outbreak of hysterical attacks, and where at times the original incident is lived over again, stereotyped in the hallucination. But our case gets its specific mould from the identity of the consciousness in the

different attacks. It is an "Etat Second" with its own memory and separated from the waking state by complete amnesia. This differentiates it from the above-mentioned twilight states and links it to the so-called somnambulant conditions.

Charcot^[5] divides the somnambulant states into two chief classes:—

1. Delirium with well-marked incoordination of representation and action.
2. Delirium with co-ordinated action. This approaches the waking state.

Our case belongs to the latter class.

If by somnambulism be understood a state of systematised partial waking,^[6] any critical review of this affection must take account of those exceptional cases of recurrent amnesias which have been observed now and again. These, apart from nocturnal ambulation, are the simplest conditions of systematised partial waking. Naef's case is certainly the most remarkable in the literature. It deals with a gentleman of 32, with a very bad family history presenting numerous signs of degeneration, partly functional, partly organic. In consequence of over-work at the age of 17 he had a peculiar twilight state with delusions, which lasted some days and was cured with a sudden recovery of memory. Later he was subject to frequent attacks of giddiness and palpitation of the heart and vomiting; but these attacks were never attended by loss of consciousness. At the termination of some feverish illness he suddenly travelled from Australia to Zürich, where he lived for some weeks in careless cheerfulness, and only came to himself when he read in the paper of his sudden disappearance from Australia. He had a total and retrograde amnesia for the several months which included the journey to Australia, his sojourn there and the return journey.

Azam^[7] has published a case of periodic amnesia. Albert X., 12-1/2 years old, of hysterical disposition, was several times attacked in the course of a few years by conditions of amnesia in which he forgot reading, writing and arithmetic, even at times his own language, for several weeks at a stretch. The intervals were normal.

Proust^[8] has published a case of *Automatisme ambulatoire* with pronounced hysteria which differs from Naef's in the repeated occurrence of the attacks. An educated man, 30 years old, exhibits all the signs of *grande hystérie*; he

is very suggestible, has from time to time, under the influence of excitement, attacks of amnesia which last from two days to several weeks. During these states he wanders about, visits relatives, destroys various objects, incurs debts, and has even been convicted of "picking pockets."

Boileau describes a similar case^[9] of wandering-impulse. A widow of 22, highly hysterical, became terrified at the prospect of a necessary operation for salpingitis; she left the hospital and fell into a state of somnambulism, from which she awoke three days later with total amnesia. During these three days she had travelled a distance of about 60 kilometres to fetch her child.

William James has described a case of an "ambulatory sort."^[10]

The Rev. Ansel Bourne, an itinerant preacher, 30 years of age, psychopathic, had on a few occasions attacks of loss of consciousness lasting one hour. One day (January 17, 1887) he suddenly disappeared from Greene, after having taken 551 dollars out of the bank. He remained hidden for two months. During this time he had taken a little shop under the name of H. J. Browne in Norriston, Pa., and had carefully attended to all purchases, although he had never done this sort of work before. On March 14, 1887, he suddenly awoke and went back home, and had complete amnesia for the interval.

Mesnet^[11] publishes the following case:—

F., 27 years old, sergeant in the African regiment, was wounded in the parietal bone at Bazeilles. Suffered for a year from hemiplegia, which disappeared when the wound healed. During the course of his illness the patient had attacks of somnambulism, with marked limitation of consciousness; all the senses were paralysed, with the exception of taste and a small portion of the visual sense. The movements were co-ordinated, but obstacles in the way of their performance were overcome with difficulty. During the attacks he had an absurd collecting-mania. By various manipulations one could demonstrate a hallucinatory content in his consciousness; for instance, when a stick was put in his hand he would feel himself transported to a battle scene, would place himself on guard, see the enemy approaching, etc.

Guinon and Sophie Waltke^[12] made the following experiments on hysterics:

—

A blue glass was held in front of the eyes of a female patient during a hysterical attack; she regularly saw the picture of her mother in the blue sky. A red glass showed her a bleeding wound, a yellow one an orange-seller or a lady with a yellow dress.

Mesnet's case reminds one of the cases of occasional attacks of shrinkage of memory.

MacNish^[13] communicates a similar case.

An apparently healthy young lady suddenly fell into an abnormally long and deep sleep—it is said without prodromal symptoms. On awaking she had forgotten the words for and the knowledge of the simplest things. She had again to learn to read, write, and count; her progress was rapid in this re-learning. After a second attack she again woke in her normal state, but without recollection of the period when she had forgotten things. These states alternated for more than four years, during which consciousness showed continuity within the two states, but was separated by an amnesia from the consciousness of the normal state.

These selected cases of various forms of changes of consciousness all throw a certain light upon our case. Naef's case presents two hysteriform eclipses of memory, one of which is marked by the appearance of delusions, and the other by its long duration, contraction of the field of consciousness, and desire to wander. The peculiar associated impulses are specially clear in the cases of Proust and Mesnet. In our case the impulsive tearing up of the flowers, the digging up of the graves, form a parallel. The continuity of consciousness which the patient presents in the individual attacks recalls the behaviour of the consciousness in MacNish's case; hence our case may be regarded as a transient phenomenon of alternating consciousness. The dreamlike hallucinatory content of the limited consciousness in our case does not, however, justify an unqualified assignment to this group of *double consciousness*. The hallucinations in the second state show a certain creativeness which seems to be conditioned by the auto-suggestibility of this state. In Mesnet's case we noticed the appearance of hallucinatory processes from simple stimulation of touch. The patient's subconsciousness

employs simple perceptions for the automatic construction of complicated scenes which then take possession of the limited consciousness. A somewhat similar view must be taken about our patient's hallucinations; at least, the external conditions which gave rise to the appearance of the hallucinations seem to strengthen our supposition. The walk in the cemetery induces the vision of the skeletons; the meeting with the three boys arouses the hallucination of children buried alive whose voices the patient hears at night-time. She arrived at the cemetery in a somnambulant state, which on this occasion was specially intense in consequence of her having taken alcohol. She performed actions almost instinctively about which her subconsciousness nevertheless did receive certain impressions. (The part played here by alcohol must not be underestimated. We know from experience that it does not only act adversely upon these conditions, but, like every other narcotic, it gives rise to a certain increase of suggestibility.) The impressions received in somnambulism subconsciously form independent growths, and finally reach perception as hallucinations. Thus our case closely corresponds to those somnambulant dream-states which have recently been subjected to a penetrating study in England and France.

These lapses of memory, which at first seem without content, gain a content by means of accidental auto-suggestion, and this content builds itself up automatically to a certain extent. It achieves no further development, probably on account of the improvement now beginning, and finally it disappears altogether as recovery sets in. Binet and Féré have made numerous experiments on the implanting of suggestions in states of partial sleep. They have shown, for example, that when a pencil is put in the anæsthetic hand of a hysteric, letters of great length are written automatically whose contents are unknown to the patient's consciousness. Cutaneous stimuli in anæsthetic regions are sometimes perceived as visual images, or at least as vivid associated visual presentations. These independent transmutations of simple stimuli must be regarded as primary phenomena in the formation of somnambulant dream-pictures. Analogous manifestations occur in exceptional cases within the sphere of waking consciousness. Goethe,^[14] for instance, states that when he sat down, lowered his head and vividly conjured up the image of a flower, he saw it undergoing changes of its own accord, as if entering into new combinations.

In half-waking states these manifestations are relatively frequent in the so-called hypnagogic hallucinations. The automatism which the Goethe example illustrates are differentiated from the truly somnambulant, inasmuch as the primary presentation is a conscious one in this case; the further development of the automatism is maintained within the definite limits of the original presentation, that is, within the purely motor or visual region.

If the primary presentation disappears, or if it is never conscious at all, and if the automatic development overlaps neighbouring regions, we lose every possibility of a demarcation between waking automatism and those of the somnambulant state; this will occur, for instance, if the presentation of a hand plucking the flower gets joined to the perception of the flower or the presentation of the smell of the flower. We can then only differentiate it by the more or less. In one case we then speak of the "waking hallucinations of the normal," in the other, of the dream-vision of the somnambulists. The interpretation of our patient's attacks as hysterical becomes more certain by the demonstration of a probably psychogenic origin of the hallucination. This is confirmed by her troubles, headache and teno-synovitis, which have shown themselves amenable to suggestive treatment. The ætiological factor alone is not sufficient for the diagnosis of hysteria; it might really be expected *a priori* that in the course of a disease which is so suitably treated by rest, as in the treatment of an exhaustion-state, features would be observed here and there which could be interpreted as manifestations of exhaustion. The question arises whether the early lapses and later somnambulant attacks could not be conceived as states of exhaustion, so-called "neurasthenic crises." We know that in the realm of psychopathic mental deficiency there can arise the most diverse epileptoid accidents, whose classification under epilepsy or hysteria is at least doubtful. To quote C. Westphal: "On the basis of numerous observations, I maintain that the so-called epileptoid attacks form one of the most universal and commonest symptoms in the group of diseases which we reckon among the mental diseases and neuropathies; the mere appearance of one or more epileptic or epileptoid attacks is not decisive for its course and prognosis. As mentioned, I have used the concept of epileptoid in the widest sense for the attack itself."^[15]

The epileptoid moments of our case are not far to seek; the objection can, however, be raised that the colouring of the whole picture is hysterical in

the extreme. Against this, however, it must be stated that every somnambulism is not *eo ipso* hysterical. Occasionally states occur in typical epilepsy which to experts seem parallel with somnambulatory states,^[16] or which can only be distinguished by the existence of genuine convulsions.^[17]

As Diehl shows,^[18] in neurasthenic mental deficiency crises also occur which often confuse the diagnosis. A definite presentation-content can even create a stereotyped repetition in the individual crisis. Lately Mörchen has published a case of epileptoid neurasthenic twilight state.^[19]

I am indebted to Professor Bleuler for the report of the following case:—

An educated gentleman of middle age—without epileptic antecedents—had exhausted himself by many years of over-strenuous mental work. Without other prodromal symptoms (such as depression, etc.) he attempted suicide during a holiday; in a peculiar twilight state he suddenly threw himself into the water from a bank, in sight of many persons. He was at once pulled out and retained but a fleeting remembrance of the occurrence.

Bearing these observations in mind, neurasthenia must be allowed to account for a considerable share in the attacks of our patient, Miss E. K. The headaches and the teno-synovitis point to the existence of a relatively mild hysteria, generally latent, but becoming manifest under the influence of exhaustion. The genesis of this peculiar illness explains the relationship which has been described between epilepsy, hysteria and neurasthenia.

Summary.—Miss Elise K. is a psychopathic defective with a tendency to hysteria. Under the influence of nervous exhaustion she suffers from attacks of epileptoid giddiness whose interpretation is uncertain at first sight. Under the influence of an unusually large dose of alcohol the attacks develop into definite somnambulism with hallucinations, which are limited in the same way as dreams to accidental external perceptions. When the nervous exhaustion is cured the hysterical manifestations disappear.

In the region of psychopathic deficiency with hysterical colouring, we encounter numerous phenomena which show, as in this case, symptoms of diverse defined diseases, which cannot be attributed with certainty to any one of them. These phenomena are partially recognised to be independent; for instance, pathological lying, pathological reveries, etc. Many of these

states, however, still await thorough scientific investigation; at present they belong more or less to the domain of scientific gossip. Persons with habitual hallucinations, and also the inspired, exhibit these states; they draw the attention of the crowd to themselves, now as poet or artist, now as saviour, prophet or founder of a new sect.

The genesis of the peculiar frame of mind of these persons is for the most part lost in obscurity, for it is only very rarely that one of these remarkable personalities can be subjected to exact observation. In view of the often great historical importance of these persons, it is much to be wished that we had some scientific material which would enable us to gain a closer insight into the psychological development of their peculiarities. Apart from the now practically useless productions of the pneumatological school at the beginning of the nineteenth century, German scientific literature is very poor in this respect; indeed, there seems to be real aversion from investigation in this field. For the facts so far gathered we are indebted almost exclusively to the labours of French and English workers. It seems at least desirable that our literature should be enlarged in this respect. These considerations have induced me to publish some observations which will perhaps help to further our knowledge concerning the relationship of hysterical twilight-states and enlarge the problems of normal psychology.

CASE OF SOMNAMBULISM IN A PERSON WITH NEUROPATHIC INHERITANCE (SPIRITUALISTIC MEDIUM).

The following case was under my observation in the years 1899 and 1900. As I was not in medical attendance upon Miss S. W., a physical examination for hysterical stigmata unfortunately could not be made. I kept a complete diary of the séances, which I filled up after each sitting. The following report is a condensed account from these notes. Out of regard for Miss S. W. and her family a few unimportant dates have been altered and a few details omitted from the story, which for the most part is composed of very intimate matters.

Miss S. W., 15½ years old. Reformed Church. The paternal grandfather was highly intelligent, a clergyman with frequent waking hallucinations (generally visions, often whole dramatic scenes with dialogues, etc.). A brother of the grandfather was an imbecile eccentric, who also saw visions.

A sister of the grandfather, a peculiar, odd character. The paternal grandmother after some fever in her 20th year (typhoid?) had a trance which lasted three days, from which she did not awake until the crown of her head had been burned by a red-hot iron. During states of excitement later on she had fainting fits which were nearly always followed by a brief somnambulism during which she uttered prophecies. Her father was likewise a peculiar, original personality with bizarre ideas. All three had waking hallucinations (second-sight, forebodings, etc.). A third brother was also eccentric and odd, talented but one-sided. The mother has an inherited mental defect often bordering on psychosis. The sister is a hysteric and visionary and a second sister suffers from "nervous heart attacks." Miss S. W. is slenderly built, skull somewhat rachitic, without pronounced hydrocephalus, face rather pale, eyes dark with a peculiar penetrating look. She has had no serious illnesses. At school she passed for average, showed little interest, was inattentive. As a rule her behaviour was rather reserved, sometimes giving place, however, to exuberant joy and exaltation. Of average intelligence, without special gifts, neither musical nor fond of books, her preference is for handwork—and day dreaming. She was often absent-minded, misread in a peculiar way when reading aloud, instead of the word *Ziege* (goat), for instance, said *Gais*, instead of *Treppe* (stair), *Stege*; this occurred so often that her brothers and sisters laughed at her. There were no other abnormalities; there were no serious hysterical manifestations. Her family were artisans and business people with very limited interests. Books of mystical content were never permitted in the family. Her education was faulty; there were numerous brothers and sisters and thus the education was given indiscriminately, and in addition the children had to suffer a great deal from the inconsequent and vulgar, indeed sometimes rough, treatment of their mother. The father, a very busy business man, could not pay much attention to his children, and died when S. W. was not yet grown up. Under these uncomfortable conditions it is no wonder that S. W. felt herself shut in and unhappy. She was often afraid to go home, and preferred to be anywhere rather than there. She was left a great deal with playmates and grew up in this way without much polish. The level of her education is relatively low and her interests correspondingly limited. Her knowledge of literature is also very limited. She knows the common school songs by heart, songs of Schiller and Goethe and a few other poets, as well as fragments from a song book and the

psalms. Newspaper stories represent her highest level in prose. Up to the time of her somnambulism she had never read any books of a serious nature. At home and from friends she heard about table-turning and began to take an interest in it. She asked to be allowed to take part in such experiments, and her desire was soon gratified. In July 1899, she took part a few times in table-turnings with some friends and her brothers and sisters, but in joke. It was then discovered that she was an excellent "medium." Some communications of a serious nature arrived which were received with general astonishment. Their pastoral tone was surprising. The spirit said he was the grandfather of the medium. As I was acquainted with the family I was able to take part in these experiments. At the beginning of August, 1899, the first attacks of somnambulism took place in my presence. They took the following course: S. W. became very pale, slowly sank to the ground, or into a chair, shut her eyes, became cataleptic, drew several deep breaths, and began to speak. In this stage she was generally quite relaxed; the reflexes of the lids remained, as did also tactile sensation. She was sensitive to unexpected noises and full of fear, especially in the initial stage.

She did not react when called by name. In somnambulic dialogues she copied in a remarkably clever way her dead relations and acquaintances, with all their peculiarities, so that she made a lasting impression upon unprejudiced persons. She also so closely imitated persons whom she only knew from descriptions that no one could deny her at least considerable talent as an actress. Gradually gestures were added to the simple speech, which finally led to "*attitudes passionelles*" and complete dramatic scenes. She took up postures of prayer and rapture, with staring eyes, and spoke with impassionate and glowing rhetoric. She then made use exclusively of a literary German which she spoke with an ease and assurance quite contrary to her usual uncertain and embarrassed manner in the waking state. Her movements were free and of a noble grace, depicting most beautifully her varying emotions. Her attitude during these states was always changing and diverse in the different attacks. Now she would lie for ten minutes to two hours on the sofa or the ground, motionless, with closed eyes; now she assumed a half-sitting posture and spoke with changed tone and speech; now she would stand up, going through every possible pantomimic gesture. Her speech was equally diversified and without rule. Now she spoke in the first person, but never for long, generally to prophesy her next attack; now she spoke of herself (and this was the most usual) in the third person. She

then acted as some other person, either some dead acquaintance or some chance person, whose part she consistently carried out according to the characteristics she herself conceived. At the end of the ecstasy there usually followed a cataleptic state with *flexibilitas cerea*, which gradually passed over into the waking state. The waxy anæmic pallor which was an almost constant feature of the attacks made one really anxious; it sometimes occurred at the beginning of the attack, but often in the second half only. The pulse was then small but regular and of normal frequency; the breathing gentle, shallow, or almost imperceptible. As already stated, S. W. often predicted her attacks beforehand; just before the attacks she had strange sensations, became excited, rather anxious, and occasionally expressed thoughts of death: "she will probably die in one of these attacks; during the attack her soul only hangs to her body by a thread, so that often the body could scarcely go on living." Once after the cataleptic attack tachypnœa lasting two minutes was observed, with a respiration rate of 100 per minute. At first the attacks occurred spontaneously, afterwards S. W. could provoke them by sitting in a dark corner and covering her face with her hands. Frequently the experiment did not succeed. She had so-called "good" and "bad" days. The question of amnesia after the attacks is unfortunately very obscure. This much is certain, that after each attack she was quite accurately orientated as to what she had gone through "during the rapture." It is, however, uncertain how much she remembered of the conversations in which she served as medium, and of changes in her surroundings during the attack. It often seemed that she did have a fleeting recollection, for directly after waking she would ask: "Who was here? Wasn't X or Y here? What did he say?" She also showed that she was superficially aware of the content of the conversations. She thus often remarked that the spirits had communicated to her before waking what they had said. But frequently this was not the case. If, at her request, the contents of the trance speeches were repeated to her she was often annoyed about them. She was then often sad and depressed for hours together, especially when any unpleasant indiscretions had occurred. She would then rail against the spirits and assert that next time she would beg her guides to keep such spirits far away. Her indignation was not feigned, for in the waking state she could but poorly control herself and her emotions, so that every mood was at once mirrored in her face. At times she seemed only slightly or not at all aware of the external proceedings during the attack.

She seldom noticed when any one left the room or came in. Once she forbade me to enter the room when she was awaiting special communications which she wished to keep secret from me. Nevertheless I went in, and sat down with the three other sitters and listened to everything. Her eyes were open and she spoke to those present without noticing me. She only noticed me when I began to speak, which gave rise to a storm of indignation. She remembered better, but still apparently only in indefinite outlines, the remarks of those taking part which referred to the trance speeches or directly to herself. I could never discover any definite rapport in this connection.

In addition to these great attacks which seemed to follow a certain law in their course, S. W. produced a great number of other automatisms. Premonitions, forebodings, unaccountable moods and rapidly changing fancies were all in the day's work. I never observed simple states of sleep. On the other hand, I soon noticed that in the middle of a lively conversation S. W. became quite confused and spoke without meaning in a peculiar monotonous way, and looked in front of her dreamily with half-closed eyes. These lapses usually lasted but a few minutes. Then she would suddenly proceed: "Yes, what did you say?" At first she would not give any particulars about these lapses, she would reply off-hand that she was a little giddy, had a headache, and so on. Later she simply said: "they were there again," meaning her spirits. She was subjected to the lapses much against her will; she often tried to defend herself: "I do not want to, not now, come some other time; you seem to think I only exist for you." She had these lapses in the streets, in business, in fact anywhere. If this happened to her in the street, she leaned against a house and waited till the attack was over. During these attacks, whose intensity was most variable, she had visions; frequently also, especially during the attacks where she turned extremely pale, she "wandered"; or as she expressed it, lost her body, and got away to distant places whither her spirits led her. Distant journeys during ecstasy strained her exceedingly; she was often exhausted for hours after, and many times complained that the spirits had again deprived her of much power, such overstrain was now too much for her; the spirits must get another medium, etc. Once she was hysterically blind for half an hour after one of these ecstasies. Her gait was hesitating, feeling her way; she had to be led; she did not see the candle which was on the table. The pupils reacted. Visions occurred in great numbers without proper "lapses" (designating by

this word only the higher grade of distraction of attention). At first the visions only occurred at the beginning of the sleep. Once after S. W. had gone to bed the room became lighted up, and out of the general foggy light there appeared white glittering figures. They were throughout concealed in white veil-like robes, the women had a head-covering like a turban, and a girdle. Afterwards (according to the statements of S. W.), "the spirits were already there" when she went to bed. Finally she also saw the figures in bright daylight, though still somewhat blurred and only for a short time, provided there were no proper lapses, in which case the figures became solid enough to take hold of. But S. W. always preferred darkness. According to her account the content of the vision was for the most part of a pleasant kind. Gazing at the beautiful figures she received a feeling of delicious blessedness. More rarely there were terrible visions of a dæmonic nature. These were entirely confined to the night or to dark rooms. Occasionally S. W. saw black figures in the neighbouring streets or in her room; once out in the dark courtyard she saw a terrible copper-red face which suddenly stared at her and frightened her. I could not learn anything satisfactory about the first occurrence of the vision. She states that once at night, in her fifth or sixth year, she saw her "guide," her grandfather (whom she had never known). I could not get any objective confirmation from her relatives of this early vision. Nothing of the kind is said to have happened until her first séance. With the exception of the hypnagogic brightness and the flashes, there were no rudimentary hallucinations, but from the beginning they were of a systematic nature, involving all the sense-organs equally. So far as concerns the intellectual reaction to these phenomena it is remarkable with what curious sincerity she regarded her dreams. Her entire somnambulic development, the innumerable puzzling events, seemed to her quite natural. She looked at her whole past in this light. Every striking event of earlier years stood to her in necessary and clear relationship to her present condition. She was happy in the consciousness of having found her real life-task. Naturally she was unswervingly convinced of the reality of her visions. I often tried to present her with some sceptical explanation, but she invariably turned this aside; in her usual condition she did not clearly grasp a reasoned explanation, and in the semi-somnambulic state she regarded it as senseless in view of the facts staring her in the face. She once said: "I do not know if what the spirits say and teach me is true, neither do I know if they are those by whose names they call themselves, but that my

spirits exist there is no question. I see them before me, I can touch them, I speak to them about everything I wish, as naturally as I'm now talking to you. They must be real." She absolutely would not listen to the idea that the manifestations were a kind of illness. Doubts about her health or about the reality of her dream would distress her deeply; she felt so hurt by my remarks that when I was present she became reserved, and for a long time refused to experiment if I was there; hence I took care not to express my doubts and thoughts aloud. From her immediate relatives and acquaintances she received undivided allegiance and admiration—they asked her advice about all kinds of things. In time she obtained such an influence upon her followers that three of her brothers and sisters likewise began to have hallucinations of a similar kind. Their hallucinations generally began as night-dreams of a very vivid and dramatic kind; these gradually extended into the waking time, partly hypnagogic, partly hypnopompic. A married sister had extraordinary vivid dreams which developed from night to night, and these appeared in the waking consciousness; at first as obscure illusions, next as real hallucinations, but they never reached the plastic clearness of S. W.'s visions. For instance, she once saw in a dream a black dæmonic figure at her bedside in animated conversation with a white, beautiful figure, which tried to restrain the black one; nevertheless the black one seized her and tried to choke her, then she awoke. Bending over her she then saw a black shadow with a human contour, and near by a white cloudy figure. The vision only disappeared when she lighted a candle. Similar visions were repeated dozens of times. The visions of the other two sisters were of a similar kind, but less intense.

This particular type of attack with the complete visions and ideas had developed in the course of less than a month, but never afterwards exceeded these limits. What was later added to these was but the extension of all those thoughts and cycles of visions which to a certain extent were already indicated quite at the beginning. As well as the "great" attacks and the lesser ones, there must also be noted a third kind of state comparable to "lapse" states. These are the *semi-somnambolic states*. They appeared at the beginning or at the end of the "great" attacks, but also appeared without any connection with them. They developed gradually in the course of the first month. It is not possible to give a more precise account of the time of their appearance. In this state a fixed gaze, brilliant eyes, and a certain dignity

and stateliness of movement are noticeable. In this phase S. W. is herself, her own somnambule ego.

She is fully orientated to the external world, but seems to stand with one foot, as it were, in her dream-world. She sees and hears her spirits, sees how they walk about in the room among those who form the circle, and stand first by one person, then by another. She is in possession of a clear remembrance of her visions, her journeys and the instructions she receives. She speaks quietly, clearly and firmly and is always in a serious, almost religious frame of mind. Her bearing indicates a deeply religious mood, free from all pietistic flavour, her speech is singularly uninfluenced by her guide's jargon compounded of Bible and tract. Her solemn behaviour has a suffering, rather pitiful aspect. She is painfully conscious of the great differences between her ideal world at night and the rough reality of the day. This state stands in sharp contrast to her waking existence; there is here no trace of that unstable and inharmonious creature, that extravagant nervous temperament which is so characteristic for the rest of her relationships. Speaking with her, you get the impression of speaking with a much older person who has attained through numerous experiences to a sure harmonious footing. In this state she produced her best results, whilst her romances correspond more closely to the conditions of her waking interests. The semi-somnambulism usually appears spontaneously, mostly during the table experiments, which sometimes announced by this means that S. W. was beginning to know beforehand every automatic communication from the table. She then usually stopped the table-turning and after a short time passed more or less suddenly into an ecstatic state. S. W. showed herself to be very sensitive. She could divine and reply to simple questions thought of by a member of the circle who was not a "medium," if only the latter would lay a hand on the table or on her hand. Genuine thought-transference without direct or indirect contact could never be achieved. In juxtaposition with the obvious development of her whole personality the continued existence of her earlier ordinary character was all the more startling. She imparted with unconcealed pleasure all the little childish experiences, the flirtations and love-secrets, all the rudeness and lack of education of her parents and contemporaries. To every one who did not know her secret she was a girl of fifteen and a half, in no respect unlike a thousand other such girls. So much the greater was people's astonishment when they got to know her in her other aspect. Her near relatives could not

at first grasp this change: to some extent they never altogether understood it, so there was often bitter strife in the family, some of them taking sides for and others against S. W., either with enthusiastic over-valuation or with contemptuous censure of "superstition." Thus did S. W., during the time I watched her closely, lead a curious, contradictory life, a real "double life" with two personalities existing side by side or closely following upon one another and contending for the mastery. I now give some of the most interesting details of the sittings in chronological order.

First and second sittings, August, 1899. S. W. at once undertook to lead the "communications." The "psychograph," for which an upturned glass tumbler was used, on which two fingers of the right hand were laid, moved quick as lightning from letter to letter. (Slips of paper, marked with letter and numbers, had been arranged in a circle round the glass.) It was communicated that the "medium's" grandfather was present and would speak to us. There then followed many communications in quick sequence, of a most religious, edifying nature, in part in properly made words, partly in words with the letters transposed, and partly in a series of reversed letters. The last words and sentences were produced so quickly that it was not possible to follow without first inverting the letters. The communications were once interrupted in abrupt fashion by a new communication, which announced the presence of the writer's grandfather. On this occasion the jesting observation was made: "Evidently the two 'spirits' get on very badly together." During this attempt darkness came on. Suddenly S. W. became very disturbed, sprang up in terror, fell on her knees and cried "There, there, do you not see that light, that star there?" and pointed to a dark corner of the room. She became more and more disturbed, and called for a light in terror. She was pale, wept, "it was all so strange, she did not know in the least what was the matter with her." When a candle was brought she became calm again. The experiments were now stopped.

At the next sitting, which took place in the evening, two days later, similar communications from S. W.'s grandfather were obtained. When darkness fell S. W. suddenly leaned back on the sofa, grew pale, almost shut her eyes, and lay there motionless. The eyeballs were turned upwards, the lid-reflex was present as well as tactile sensation. The breathing was gentle, almost imperceptible. The pulse small and weak. This attack lasted about half an hour, when S. W. suddenly sighed and got up. The extreme pallor,

which had lasted throughout the whole attack, now gave place to her usual pale pink colour. She was somewhat confused and distraught, indicated that she had seen all sorts of things, but would tell nothing. Only after urgent questioning would she relate that in an extraordinary waking condition she had seen her grandfather arm-in-arm with the writer's grandfather. The two had gone rapidly by in an open carriage, side by side.

III. In the third séance, which took place some days later, there was a similar attack of more than half an hour's duration. S. W. afterwards told of many white, transfigured forms who each gave her a flower of special symbolic significance. Most of them were dead relatives. Concerning the exact content of their talk she maintained an obstinate silence.

IV. After S. W. had entered into the somnambulic state she began to make curious movements with her lips, and made swallowing gurgling noises. Then she whispered very softly and unintelligibly. When this had lasted some minutes she suddenly began to speak in an altered deep voice. She spoke of herself in the third person. "She is not here, she has gone away." There followed several communications of a religious kind. From the content and the way of speaking it was easy to conclude that she was imitating her grandfather, who had been a clergyman. The content of the talk did not rise above the mental level of the "communications." The tone of the voice was somewhat forced, and only became natural when, in the course of the talk, the voice approximated to the medium's own.

(In later sittings the voice was only altered for a few moments when a new spirit manifested itself.)

Afterwards there was amnesia for the trance-conversation. She gave hints about a sojourn in the other world, and she spoke of an undreamed-of blessedness which she felt. It must be further noted that her conversation in the attack occurred quite spontaneously, and was not in response to any suggestions.

Directly after this séance S. W. became acquainted with the book of Justinus Kerner, "Die Seherin von Prevorst." She began thereupon to magnetise herself towards the end of the attack, partly by means of regular passes, partly by curious circles and figures of eight, which she described symmetrically with both arms. She did this, she said, to disperse the severe

headaches which occurred after the attacks. In the August séances, not detailed here, there were in addition to the grandfather numerous spirits of other relatives who did not produce anything very remarkable. Each time when a new one came on the scene the movement of the glass was changed in a striking way; it generally ran along the rows of letters, touching one or other of them, but no sense could be made of it. The orthography was very uncertain and arbitrary, and the first sentences were frequently incomprehensible or broken up into a meaningless medley of letters. Generally automatic writing suddenly began at this point. Sometimes automatic writing was attempted during complete darkness. The movements began with violent backward jerks of the whole arm, so that the paper was pierced by the pencil. The first attempt at writing consisted of numerous strokes and zigzag lines about 8 cm. high. In later attempts there came first unreadable words, in large handwriting, which gradually became smaller and clearer. It was not essentially different from the medium's own. The grandfather was again the controlling spirit.

V. Somnambulic attacks in September, 1899. S. W. sits upon the sofa, leans back, shuts her eyes, breathes lightly and regularly. She gradually becomes cataleptic, the catalepsy disappears after about two minutes, when she lies in an apparently quiet sleep with complete muscular relaxation. She suddenly begins to speak in a subdued voice: "No! you take the red, I'll take the white, you can take the green, and you the blue. Are you ready? We will go now." (A pause of several minutes during which her face assumes a corpse-like pallor. Her hands feel cold and are very bloodless.) She suddenly calls out with a loud, solemn voice: "Albert, Albert, Albert," then whispering: "Now you speak," followed by a longer pause, when the pallor of the face attains the highest possible degree. Again, in a loud solemn voice, "Albert, Albert, do you not believe your father? I tell you many errors are contained in N.'s teaching. Think about it." Pause. The pallor of the face decreases. "He's very frightened. He could not speak any more." (These words in her usual conversational tone.) Pause. "He will certainly think about it," S. W. now speaks again in the same tone, in a strange idiom which sounds like French or Italian, now recalling the former, now the latter. She speaks fluently, rapidly, and with charm. It is possible to understand a few words but not to remember the whole, because the language is so strange. From time to time certain words recur, as *wena*, *wenes*, *wenai*, *wene*, etc. The absolute naturalness of the proceedings is

bewildering. From time to time she pauses as if some one were answering her. Suddenly she speaks in German, "Is time already up?" (In a troubled voice.) "Must I go already? Goodbye, goodbye." With the last words there passes over her face an indescribable expression of ecstatic blessedness. She raises her arms, opens her eyes,—hitherto closed,—looks radiantly upwards. She remains a moment thus, then her arms sink slackly, her eyes shut, the expression of her face is tired and exhausted. After a short cataleptic stage she awakes with a sigh. She looks around astonished: "I've slept again, haven't I?" She is told she has been talking during the sleep, whereupon she becomes much annoyed, and this increases when she learns she has spoken in a foreign tongue. "But didn't I tell the spirits I don't want it? It mustn't be. It exhausts me too much." Begins to cry. "Oh, God! Oh, God! must then everything, everything, come back again like last time? Is nothing spared me?" The next day at the same time there was another attack. When S. W. has fallen asleep Ulrich von Gerbenstein suddenly announces himself. He is an entertaining chatterer, speaks very fluently in high German with a North-German accent. Asked what S. W. is now doing, after much circumlocution he explains that she is far away, and he is meanwhile here to look after her body, the circulation of the blood, the respiration, etc. He must take care that meanwhile no black person takes possession of her and harms her. Upon urgent questioning he relates that S. W. has gone with the others to Japan, to appear to a distant relative and to restrain him from a stupid marriage. He then announces in a whisper the exact moment when the manifestation takes place. Forbidden any conversation for a few minutes, he points to the sudden pallor occurring in S. W., remarking that materialisation at such a great distance is at the cost of correspondingly great force. He then orders cold bandages to the head to alleviate the severe headache which would occur afterwards. As the colour of the face gradually becomes more natural the conversation grows livelier. All kinds of childish jokes and trivialities are uttered; suddenly U. von G. says, "I see them coming, but they are still very far off; I see them there like a star." S. W. points to the North. We are naturally astonished, and ask why they do not come from the East, whereto U. von G. laughingly retorts: "Oh, but they come the direct way over the North Pole. I am going now; farewell." Immediately after S. W. sighs, wakes up, is ill-tempered, complains of extremely bad headache. She saw U. von G. standing by her

body; what had he told us? She gets angry about the "silly chatter" from which he cannot refrain.

VI. Begins in the usual way. Extreme pallor; lies stretched out, scarcely breathing. Speaks suddenly, with loud, solemn voice: "Yes, be frightened; I am; I warn you against N.'s teaching. See, in hope is everything that belongs to faith. You would like to know who I am. God gives where one least expects it. Do you not know me?" Then unintelligible whispering; after a few minutes she awakes.

VII. S. W. soon falls asleep; lies stretched out on the sofa. Is very pale. Says nothing, sighs deeply from time to time. Casts up her eyes, rises, sits on the sofa, bends forward, speaks softly: "You have sinned grievously, have fallen far." Bends forward still, as if speaking to some one who kneels before her. She stands up, turns to the right, stretches out her hands, and points to the spot over which she has been bending. "Will you forgive her?" she asks, loudly. "Do not forgive men, but their spirits. Not she, but her human body has sinned." Then she kneels down, remains quite still for about ten minutes in the attitude of prayer. Then she gets up suddenly, looks to heaven with ecstatic expression, and then throws herself again on her knees, with her face bowed on her hands, whispering incomprehensible words. She remains rigid in this position several minutes. Then she gets up, looks again upwards with a radiant countenance, and lies down on the sofa; soon after she wakes.

DEVELOPMENT OF THE SOMNAMBULIC PERSONALITIES.

At the beginning of many séances the glass was allowed to move by itself, when occasionally the advice followed in stereotyped fashion: "You must ask."

Since convinced spiritualists took part in the séances, all kinds of spiritualistic wonders were of course demanded, and especially the "protecting spirits." In reply, sometimes names of well-known dead people were produced, sometimes unknown names, *e.g.* Berthe de Valours, Elizabeth von Thierfelsenburg, Ulrich von Gerbenstein, etc. The controlling spirit was almost without exception the medium's grandfather, who once explained: "he loved her more than any one in this world because he had

protected her from childhood up, and knew all her thoughts." This personality produced a flood of Biblical maxims, edifying observations, and song-book verses; the following is a specimen:—

In true believing,
To faith in God cling ever nigh,
Thy heavenly comfort never leaving,
Which having, man can never die.
Refuge in God is peace for ever,
When earthly cares oppress the mind;
Who from the heart can pray is never
Bowed down by fate, howe'er unkind.

Numerous similar elaborations betrayed by their banal, unctuous contents their origin in some tract or other. When S. W. had to speak in ecstasy, lively dialogues developed between the circle-members and the somnambulant personality. The content of the answers received is essentially just the same commonplace edifying stuff as that of the psychographic communications. The character of this personality is distinguished by its dry and tedious solemnity, rigorous conventionality and pietistic virtue (which is not consistent with the historic reality). The grandfather is the medium's guide and protector. During the ecstatic state he gives all kinds of advice, prophesies later attacks and the visions she will see on waking, etc. He orders cold bandages, gives directions concerning the medium's lying down or the date of the séances. His relationship to the medium is an extremely tender one. In liveliest contrast to this heavy dream-person stands a personality, appearing first sporadically, in the psychographic communications of the first séance. It soon disclosed itself as the dead brother of a Mr. R., who was then taking part in the séance. This dead brother, Mr. P. R., was full of commonplaces about brotherly love towards his living brother. He evaded particular questions in all manner of ways. But he developed a quite astonishing eloquence towards the ladies of the circle and in particular offered his allegiance to one whom Mr. P. R. had never known when alive. He affirmed that he had already cared very much for her in his lifetime, had often met her in the street without knowing who she was, and was now uncommonly delighted to become acquainted with her in this unusual manner. With such insipid compliments, scornful remarks to the men, harmless childish jokes, etc., he took up a large part of the séance. Several of the members found fault with the frivolity and banality of this "spirit," whereupon he disappeared for one or two séances, but soon reappeared, at first well-behaved, often indeed uttering Christian maxims, but soon dropping back into the old tone. Besides these two sharply differentiated personalities, others appeared who varied but little from the grandfather's type; they were mostly dead relatives of the medium. The general atmosphere of the first two months' séances was accordingly solemnly edifying, disturbed only from time to time by Mr. P. R.'s trivial chatter. Some weeks after the beginning of the séances, Mr. R. left our circle, whereupon a remarkable change took place in Mr. P. R.'s conversation. He became monosyllabic, came less often, and after a few séances vanished altogether, later on he reappeared but with great infrequency, and for the most part only when the medium was alone with the particular lady mentioned. Then a new personality forced himself into the foreground; in contrast to Mr. P. R., who always spoke the Swiss dialect, this gentleman adopted an affected North-German way of speaking. In all else he was an exact copy of Mr. P. R. His eloquence was somewhat remarkable, since S. W. had only a very scanty knowledge of high German, whilst this new personality, who called himself Ulrich von

Gerbenstein, spoke an almost faultless German, rich in charming phrases and compliments.
[20]

Ulrich von Gerbenstein was a witty chatterer, full of repartee, an idler, a great admirer of the ladies, frivolous, and most superficial.

During the winter of 1899-1900 he gradually came to dominate the situation more and more, and took over one by one all the above-mentioned functions of the grandfather, so that under his influence the serious character of the séances disappeared.

All suggestions to the contrary proved unavailing, and at last the séances had on this account to be suspended for longer and longer intervals. There is a peculiarity common to all these somnambulatory personalities which must be noted. They have access to the medium's memory, even to the unconscious portion, they are also *au courant* with the visions which she has in the ecstatic state, but they have only *the most superficial knowledge of her phantasies during the ecstasy*. Of the somnambulatory dreams they know only what they occasionally pick up from the members of the circle. On doubtful points they can give no information, or only such as contradicts the medium's explanations. The stereotyped answer to these questions runs: "Ask Ivenes."^[21] "Ivenes knows." From the examples given of different ecstatic moments it is clear that the medium's consciousness is by no means idle during the trance, but develops a striking and multiplex phantastic activity. For the reconstruction of S. W.'s somnambulatory self we have to depend altogether upon her several statements; for in the first place her spontaneous utterances connecting her with the waking self are few, and often irrelevant, and in the second very many of these ecstatic states go by without gesture, and without speech, so that no conclusions as to the inner happenings can afterwards be drawn from the external appearances. *S. W. is almost totally amnesic for the automatic phenomena during ecstasy as far as they come within the territory of the new personalities of her ego. Of all the other phenomena, such as loud talking, babbling, etc., which are directly connected with her own ego she usually has a clear remembrance.* But in every case there is complete amnesia only during the first few minutes after the ecstasy. Within the first half-hour, during which there usually prevails a kind of semi-somnambulism with a dreamlike manner, hallucinations, etc., the amnesia gradually disappears, whilst fragmentary memories emerge of what has occurred, but in a quite irregular and arbitrary fashion.

The later séances were usually begun by our hands being joined and laid on the table, whereon the table at once began to move. Meanwhile S. W. gradually became somnambulatory, took her hands from the table, lay back on the sofa, and fell into the ecstatic sleep. She sometimes related her experiences to us afterwards, but showed herself very reticent if strangers were present. After the very first ecstasy she indicated that she played a distinguished *rôle* among the spirits. She had a special name, as had each of the spirits; hers was *Ivenes*; her grandfather looked after her with particular care. In the ecstasy with the flower-vision we learnt her special secret, hidden till then beneath the deepest silence. During the séances in which her spirit spoke she made long journeys, mostly to relatives, to whom she said she appeared, or she found herself on the Other Side, in "That space between the stars which people think is empty, but in which there are really very many spirit-worlds." In the semi-somnambulatory state which frequently followed her attacks, she once described, in peculiar poetic fashion, a landscape on the Other Side, "a wondrous, moon-lit valley, set aside for the races not yet born." She represented her somnambulatory ego as being almost completely

released from the body. It is a fully-grown but small, black-haired woman, of pronounced Jewish type, clothed in white garments, her head covered with a turban. She understands and speaks the language of the spirits, "for spirits still, from old human custom, do speak to one another, although they do not really need to, since they mutually understand one another's thoughts." She "does not really always talk with the spirits, but just looks at them, and so understands their thoughts." She travels in the company of four or five spirits, dead relatives, and visits her living relatives and acquaintances in order to investigate their life and their way of thinking; she further visits all places which lie within the radius of these spectral inhabitants. From her acquaintanceship with Kerner's book, she discovered and improved upon the ideas of the black spirits who are kept enchanted in certain places, or exist partly beneath the earth's surface (compare the "Seherin von Prevorst"). This activity caused her much trouble and pain; in and after the ecstasy she complained of suffocating feelings, violent headache, etc. But every fortnight, on Wednesdays, she could pass the whole night in the garden on the Other Side in the company of holy spirits. There she was taught everything concerning the forces of the world, the endless complicated relationships and affinities of human beings, and all besides about the laws of reincarnation, the inhabitants of the stars, etc. Unfortunately only the system of the world-forces and reincarnation achieved any expression. As to the other matters she only let fall disconnected observations. For example, once she returned from a railway journey in an extremely disturbed state. It was thought at first something unpleasant had happened, till she managed to compose herself, and said, "A star-inhabitant had sat opposite to her in the train." From the description which she gave of this being, I recognised a well-known elderly merchant I happened to know, who has a rather unsympathetic face. In connection with this experience she related all kinds of peculiarities of these star-dwellers; they have no god-like souls, as men have, they pursue no science, no philosophy, but in technical arts they are far more advanced than men. Thus on Mars a flying-machine has long been in existence; the whole of Mars is covered with canals, these canals are cleverly excavated lakes and serve for irrigation. The canals are quite superficial; the water in them is very shallow. The excavating caused the inhabitants of Mars no particular trouble, for the soil there is lighter than the earth's. The canals are nowhere bridged, but that does not prevent communication, for everything travels by flying-machine. Wars no longer occur on the stars, for no differences of opinion exist. The star-dwellers have not human bodies, but the most laughable ones possible, such as one would never imagine. Human spirits who are allowed to travel on the Other Side may not set foot on the stars. Equally, wandering star-dwellers may not come to the earth, but must remain at a distance of twenty-five metres above the earth's surface. Should they transgress they remain in the power of the earth, and must assume human bodies, and are only set free again after their natural death. As men, they are cold, hard-hearted, cruel. S. W. recognises them by a singular expression in which the "Spiritual" is lacking, and by their hairless, eyebrowless, sharply-cut faces. Napoleon was a star-dweller.

In her journeys she does not see the places through which she hastens. She has a feeling of floating, and the spirits tell her when she is at the right spot. Then, as a rule, she only sees the face and upper part of the person to whom she is supposed to appear, or whom she wishes to see. She can seldom say in what kind of surroundings she sees this person. Occasionally she saw me, but only my head without any surroundings. She occupied herself much with the enchanting of spirits, and for this purpose she wrote oracular sayings in a foreign tongue, on

slips of paper which she concealed in all sorts of queer places. An Italian murderer, presumably living in my house, and whom she called Conventi, was specially displeasing to her. She tried several times to cast a spell upon him, and without my knowledge hid several papers about, on which messages were written; these were later found by chance. One such, written in red ink, was as follows:

Conventi
Marche. 4 govi
Ivenes.

Conventi, go
orden, Astaf
vent.

Gen palus, vent allis
ton prost afta ben genallis.

Unfortunately, I never obtained any interpretation of this. S. W. was quite inaccessible in this matter. Occasionally the somnambulist Ivenes speaks directly to the public. She does so in dignified fashion, rather precociously, but she is not wearisomely unctuous and impossibly twaddling as are her two guides; she is a serious, mature person, devout and pious, full of womanly tenderness and great modesty, always yielding to the judgments of others. This expression of plaintive emotion and melancholy resignation is peculiar to her. She looks beyond this world, and unwillingly returns to reality; she bemoans her hard lot, and her unsympathetic family surroundings. Associated with this there is something elevated about her; she commands her spirits, despises the twaddling chatter of Gerbenstein, consoles others, directs those in distress, warns and protects them from dangers to body and soul. She is the intermediary for the entire intellectual output of all manifestations, but she herself ascribes it to the direction of the spirits. It is Ivenes who entirely controls S. W.'s semi-somnambulist state.

In semi-somnambulism S. W. gave some of those taking part in the séances the opportunity to compare her with the "Seherin von Prevorst" (Prophetess of Prevorst). This suggestion was not without results. S. W. gave hints of earlier existences which she had already lived through, and after a few weeks she suddenly disclosed a whole system of reincarnations, although she had never before mentioned anything of the kind. Ivenes is a spiritual being who is something more than the spirits of other human beings. Every human spirit must incorporate himself twice in the course of the centuries. But Ivenes must incorporate herself at least once every two hundred years; besides herself only two other persons have participated in this fate, namely, Swedenborg and Miss Florence Cook (Crookes's famous medium). S. W. calls these two personages her brother and sister. She gave no information

about their pre-existences. In the beginning of the nineteenth century Ivenes was Frau Hauffe, the Prophetess of Prevorst; at the end of the eighteenth century, a clergyman's wife in central Germany (locality unknown). As the latter she was seduced by Goethe and bore him a child. In the fifteenth century she was a Saxon countess, and had the poetic name of Thierfelsenburg. Ulrich von Gerbenstein is a relative from that line. The interval of 300 years, and her adventure with Goethe, must be atoned for by the sorrows of the Prophetess of Prevorst. In the thirteenth century she was a noblewoman of Southern France, called de Valours, and was burnt as a witch. From the thirteenth century to the Christian persecution under Nero there were numerous reincarnations of which S. W. could give no detailed account. In the Christian persecution under Nero she played a martyr's part. Then comes a period of obscurity till the time of David, when Ivenes was an ordinary Jewess. After her death she received from Astaf, an angel from a high heaven, the mandate for her future wonderful career. In all her pre-existences she was a medium and an intermediary in the intercourse between this side and the other. Her brothers and sisters are equally old and have the like vocation. In her various pre-existences she was sometimes married, and in this way gradually founded a whole system of relationships with whose endless complicated inter-relations she occupied herself in many ecstasies. Thus, for example, about the eighth century she was the mother of her earthly father and, moreover, of her grandfather, and mine. Hence the striking friendship of these two old gentlemen, otherwise strangers. As Mme. de Valours she was the present writer's mother. When she was burnt as a witch the writer took it much to heart, and went into a cloister at Rouen, wore a grey habit, became Prior, wrote a work on Botany and died at over eighty years of age. In the refectory of the cloister there hung a picture of Mme. de Valours, in which she was depicted in a half-reclining position. (S. W. in the semi-somnambule state often took this position on the sofa. It corresponds exactly to that of Mme. Recamier in David's well-known picture.) A gentleman who often took part in the séances, who had some slight resemblance to the writer, was also one of her sons from that period. Around this core of relationship there grouped themselves, more or less intimately connected, all the persons in any way related or known to her. One came from the fifteenth century, another—a cousin—from the eighteenth century, and so on.

From the three great family stocks grew by far the greater part of the present European peoples. She and her brothers and sisters are descended from Adam, who arose by materialisation; the other then-existing families, from whom Cain took his wife, were descended from apes. S. W. produced from this circle of relationship an extensive family-gossip, a very flood of romantic stories, piquant adventures, etc. Sometimes the target of her romances was a lady acquaintance of the writer's who for some undiscoverable reason was peculiarly antipathetic to her. She declared that this lady was an incarnation of a celebrated Parisian poisoner, who had achieved great notoriety in the eighteenth century. She maintained that this lady still continued her dangerous work, but in a much more ingenious way than formerly; through the inspiration of the wicked spirits who accompany her she had discovered a liquid which when merely exposed to the air attracted tubercle bacilli and formed a splendid developing medium for them. By means of this liquid, which she was wont to mix with the food, the lady had brought about the death of her husband (who had indeed died of tuberculosis); also one of her lovers, and of her own brother, for the sake of his inheritance. Her eldest son was an illegitimate child by her lover. As a widow she had secretly borne to another lover an illegitimate child, and finally she had had an unnatural relationship with her

own brother (who was later on poisoned). In this way S. W. spun innumerable stories, in which she believed quite implicitly. The persons of these stories appeared in the drama of her visions, as did the lady before referred to, going through the pantomime of making confession and receiving absolution of sins. Everything interesting occurring in her surroundings was incorporated in this system of romances, and given an order in the network of relationships with a more or less exact statement as to their pre-existences and the spirits influencing them. It fared thus with all who made S. W.'s acquaintance: they were valued at a second or first incarnation, according as they possessed a marked or indefinite character. They were generally described as relatives, and always exactly in the same definite way. Only subsequently, often several weeks later, after an ecstasy, there would make its appearance a new complicated romance which explained the striking relationship through pre-existences or through illegitimate relations. Persons sympathetic to S. W. were usually very near relatives. Most of these family romances were very carefully made up, so that to contradict them was impossible. They were always worked out with a quite bewildering certainty, and surprised one by an extremely clever evaluation of certain details which she had noticed or taken from somewhere. For the most part the romances had a ghastly character, murder by poison and dagger, seduction and divorce, forgery of wills, played the chief rôle.

Mystic Science.—In reference to scientific questions S. W. put forward numerous suggestions. Generally towards the end of the séances there was talk and debate about various subjects of scientific and spiritistic nature. S. W. never took part in the discussion, but generally sat dreamily in a corner in a semi-somnambulist state. She listened to one and another, taking hold of the talk in a half-dream, but she could never relate anything connectedly; if asked about it only partial explanations were given. In the course of the winter hints emerged in various séances: "The spirits taught her about the world-forces and the strange revelations from the other side, yet she would not tell anything now." Once she tried to give a description, but only said: "On one side was the light, on the other the power of attraction." Finally, in March 1900, when for some time nothing had been heard of the teachings at the séances, she announced suddenly with a joyful face that she had now received everything from the spirits. She drew out a long narrow strip of paper upon which were numerous names. Although I asked for it she would not let it leave her hands, but dictated the following scheme to me.

good men and those mediums who bring about interviews of good spirits on the earth have most Magnesor. Somewhere about the middle there stand the life forces of animals, and in Cafor that of plants. Nothing is known about Hefa, or rather S. W. can give no information. Persus is the fundamental power which comes to light in the phenomenon of the forces of locomotion. Its recognisable forces are Warmth, Light, Electricity, Magnetism, and two unknown forces, one of which only exists in comets. Of the powers of the seventh circle S. W. could only point out north and south magnetism and positive and negative electricity. *Deka* is unknown. *Smar* is of peculiar significance, to be indicated below; it leads to—

2. *Hypnos Group*.—*Hypnos* and *Hyfonismus* are powers which only dwell within certain beings, in those who are in a position to exert a magnetic influence upon others. *Athialowi* is the sexual instinct. Chemical affinity is directly derived from it. In the ninth circle under it arises indolence (that is the line of *Smar*). *Svens* and *Kara* are of unknown significance. *Pusa* corresponds to *Smar* in the opposite sense.

3. *The Connesor Group*.—Connesor is the opposite pole of Magnesor. It is the dark and wicked power equal in intensity to the good power of light. While the good power creates, this one turns into the opposite. Endos is an elemental power of minerals. From these (significance unknown) gravitation proceeds, which on its side is designated as the elemental force of the forces of resistance that occur in phenomena (gravity, capillarity, adhesion and cohesion). Nakus is the secret power of a rare stone which controls the effect of snake poison. The two powers *Smar* and *Pusa* have a special importance. According to S. W., *Smar* develops in the bodies of morally good men at the moment of death. This power enables the soul to rise to the powers of light. *Pusa* behaves in the opposite way, for it is the power which conducts morally bad people to the dark side in the state of Connesor.

In the sixth circle the visible world begins, which only appears to be so sharply divided from the other side in consequence of the fickleness of our organs of sense. In reality the transition is a very gradual one, and there are people who live on a higher stage of knowledge because their perceptions and sensations are more delicate than those of others. Great seers are enabled to see manifestations of force where ordinary people can perceive nothing. S. W. sees Magnesor as a white or bluish vapour, which chiefly develops when good spirits are near. Connesor is a dark vapour-like fluid, which, like Magnesor, develops on the appearance of "black" spirits. For instance, the night before the beginning of great visions the shiny vapour of Magnesor spreads in thick layers, out of which, the good spirits grow to visible white forces. It is just the same with Connesor. But these powers have their different mediums. S. W. is a Magnesor medium, as were the Prophetess of Prevorst and Swedenborg. The materialisation mediums of the spiritualists are mostly Connesor mediums, because materialisation takes place much more easily through Connesor on account of its close connection with the properties of matter. In the summer of 1900 S. W. tried several times to produce the circles of matter, but she never arrived at other than vague and incomprehensible hints and afterwards spoke no more about this.

Conclusion.—The really interesting and valuable séances came to an end with the production of the system of powers. Before this a gradual decline in the vividness of the ecstasies was noticeable. Ulrich von Gerbenstein came increasingly to the front, and filled up the séances with his childish chatter. The visions which S. W. had in the meantime likewise seem to have lost vividness and plasticity of formation, for S. W. was afterwards only able to feel pleasant

sensations in the presence of good spirits, and disagreeableness in that of bad spirits. Nothing new was produced. There was something of uncertainty in the trance talks, as if feeling and seeking for the impression which she was making upon the audience, together with an increasing staleness in the content. In the outward behaviour of S. W. there arose also a marked shyness and uncertainty, so that the impression of wilful deception became ever stronger. The writer therefore soon withdrew from the séances. S. W. experimented afterwards in other circles, and six months after my leaving was caught cheating *in flagranti delicto*. She wanted to arouse again by spiritualistic experiments the lost belief in her supernatural powers; she concealed small objects in her dress, throwing them up in the air during the dark séance. With this her part was played out. Since then, eighteen months have passed during which I have not seen S. W. I have learnt from an observer who knew her in the earlier days, that she has now and again strange states of short duration during which she is very pale and silent, and has a fixed glittering look. I did not hear any more of visions. She is said not to take part any longer in spiritualistic séances. S. W. is now in a large business, and according to all accounts is an industrious and responsible person who does her work eagerly and cleverly, giving entire satisfaction. According to the account of trustworthy persons, her character has much improved; she has become quieter, more regular and sympathetic. No other abnormalities have appeared in her. This case, in spite of its incompleteness, contains a mass of psychological problems whose exposition goes far beyond the limits of this little work. We must therefore be satisfied with a mere sketch of the various striking manifestations. For the sake of a more lucid exposition it seems better to review the various states separately.

1. The *Waking State*.—Here the patient shows various peculiarities. As we have seen, at school she was often distracted, lost herself in a peculiar way, was moody; her behaviour changes inconsequently, now quiet, shy, reserved, now lively, noisy and talkative. She cannot be called unintelligent, but she strikes one sometimes as narrow-minded, sometimes as having isolated intelligent moments. Her memory is good on the whole, but owing to her distraction it is much impaired. Thus, despite much discussion and reading of Kerner's "Seherin von Prevorst," for many weeks, she does not know, if directly asked, whether the author's name is *Koerner* or *Kerner*, nor the name of the Prophetess. All the same, when it occasionally comes up, the name *Kerner* is correctly written in the automatic communications. In general it may be said that her character has something extremely impulsive, incomprehensible, protean. Deducting the want of balance due to puberty, there remains a pathological residue which expresses itself in reactions which follow no rule and a bizarre unaccountable character. This character may be called *déséquilibré*, or unstable. Its specific mould is derived from traits which can certainly be regarded as hysterical. This is decidedly so in the conditions of distraction. As Janet^[22] maintains, the foundation of hysterical anæsthesia is the loss of attention. He was able to prove in youthful hysterics "a striking indifference and distracted attention in the whole region of the emotional life." Misreading is a notable instance, which beautifully illustrates hysterical dispersion of attention. The psychology of this process may perhaps be viewed as follows: during reading aloud attention becomes paralysed for this act and is directed towards some other object. Meanwhile the reading is continued mechanically, the sense impressions are received as before, but in consequence of the dispersion the excitability of the perceptive centre is lowered, so that the strength of the sense impression is no longer adequate to fix the attention in such a way that perception as such is conducted

along the motor speech route; thus all the inflowing associations which at once unite with any new sense impression are repressed. The further psychological mechanism permits of only two possible explanations: (1) The admission of the sense impression is received unconsciously (because of the increase of threshold stimulus), in the perceptive centre just below the threshold of consciousness, and consequently is not incorporated in the attention and conducted back to the speech route. It only reaches verbal expression through the intervention of the nearest associations, in our case through the dialect expression^[23] for the object. (2) The sense impression is perceived consciously, but at the moment of its entrance into the speech route it reaches a territory whose excitability is diminished by the dispersion of attention. At this place the dialect word is substituted by association for the motor speech image, and it is uttered as such. In either case it is certain that it is the acoustic dispersed attention which fails to correct the error. Which of the two explanations is correct cannot be proved in this case; probably both approach the truth, for the dispersion of attention seems to be general, and in each case concerns more than one of the centres engaged in the act of reading aloud. In our case this phenomenon has a special value, for we have here a quite elementary automatic phenomenon. It may be called hysterical in so far as in this concrete case a state of exhaustion and intoxication, with its parallel manifestations, can be excluded. A healthy person only exceptionally allows himself to be so engaged by an object that he fails to correct the errors of a dispersed attention—those of the kind described. The frequency of these occurrences in the patient point to a considerable limitation of the field of consciousness, in so far as she can only master a relative minimum of elementary sensations flowing in at the same time. If we wish to describe more exactly the psychological state of the "psychic shady side," we might call it either a sleeping or a dream-state, according as passivity or activity predominated. There is, at all events, a pathological dream-state of very rudimentary extension and intensity and its genesis is spontaneous; dream-states arising spontaneously, with the production of automatisms, are generally regarded as hysterical on the whole. It must be pointed out that these instances of misreading occurred frequently in our subject, and that the term hysterical is employed in this sense; so far as we know, it is only on a foundation of hysterical constitution that spontaneous states of partial sleep or dreams occur frequently.

Binet^[24] has studied experimentally the automatic substitution of some adjacent association in his hysterics. If he pricked the anæsthetic hand of the patient without his noticing the prick, he thought of "points"; if the anæsthetic finger was moved, he thought of "sticks" or "columns." When the anæsthetic hand, concealed from the patient's sight by a screen, writes "Salpêtrière," she sees in front of her the word "Salpêtrière" in white writing on a black ground. This recalls the experiments above referred to of Guinon and Sophie Waltke.

We thus find in our subject, at a time when there was nothing to indicate the later phenomena, rudimentary automatisms, fragments of dream manifestations, which imply in themselves the possibility that some day more than one association would creep in between the perception of the dispersed attention and consciousness. The misreading shows us, moreover, a certain automatic independence of the psychical elements. This occasionally expands to a more or less fleeting dispersion of attention, although with very slight results which are never in any way striking or suspicious; this dispersedness approximates to that of the physiological dream. The misreading can be thus conceived as a prodromal symptom of the later events;

especially as its psychology is prototypical for the mechanism of somnambulatory dreams, which are indeed nothing but a many-sided multiplication and manifold variation of the elementary processes reviewed above. I never succeeded in demonstrating during my observations similar rudimentary automatisms. It would seem that in course of time the states of dispersed attention, to a certain extent beneath the surface of consciousness, at first of low degree have grown into these remarkable somnambulatory attacks; hence they disappeared during the waking state, which was free from attacks. So far as concerns the development of the patient's character, beyond a certain not very extensive ripening, no remarkable change could be demonstrated during the observations lasting nearly two years. More remarkable is the fact that in the two years since the cessation (complete?) of the somnambulatory attacks, a considerable change in character has taken place. We shall have occasion later on to speak of the importance of this observation.

Semi-Somnambulism.—In S. W.'s case the following condition was indicated by the term semi-somnambulism. For some time after and before the actual somnambulatory attack the patient finds herself in a state whose most salient feature can best be described as "preoccupation." She only lends half an ear to the conversation around her, answers at random, often gets absorbed in all manner of hallucinations; her face is solemn, her look ecstatic, visionary, ardent. Closer observation discloses a far-reaching alteration of the entire character. She is now serious, dignified; when she speaks her subject is always an extremely serious one. In this condition she can talk so seriously, forcibly and convincingly, that one is tempted to ask oneself if this is really a girl of fifteen and a half. One has the impression of a mature woman possessed of considerable dramatic talent. The reason for this seriousness, this solemnity of behaviour, is given in her explanation that at these times she stands at the frontier of this world and the other, and associates just as truly with the spirits of the dead as with living people. And, indeed, her conversation is usually divided between answers to real objective questions and hallucinatory ones. I call this state semi-somnambulism because it coincides with Richet's own definition. He^[25] says: "La conscience de cet individu persiste dans son intégrité apparente, toutefois des opérations très compliquées vont s'accomplir en dehors de la conscience sans que le moi volontaire et conscient paraisse ressentir une modification quelconque. Une autre personne sera en lui qui agira, pensera, voudra, sans que la conscience, c'est à dire le moi réfléchi conscient, aît la moindre notion."

Binet^[26] says of this term: "Le terme indique la parenté de cet état avec le somnambulisme véritable, et en suite il laisse comprendre que la vie somnambulique qui se manifeste durant la veille est réduite, déprimée, par la conscience normale qui la recouvre."

AUTOMATISMS.

Semi-somnambulism is characterised by the continuity of consciousness with that of the waking state and by the appearance of various automatisms which give evidence of an activity of the subconscious self, independent of that of consciousness.

Our case shows the following automatic phenomena:

- (1) Automatic movements of the table.

(2) Automatic writing.

(3) Hallucinations.

1. *Automatic Movements of the Table.*—Before the patient came under my observation she had been influenced by the suggestion of "table-turning," which she had first come across as a game. As soon as she entered the circle there appeared communications from members of her family which showed her to be a medium. I could only find out that, as soon as ever her hand was placed on the table, the typical movements began. The resulting communications have no interest for us. But the automatic character of the act itself deserves some discussion, for we may, without more ado, set aside the imputation that there was any question of intentional and voluntary pushing or pulling on the part of the patient.

As we know from the investigations of Chevreul,^[27] Gley, Lehmann and others, unconscious motor phenomena are not only of frequent occurrence among hysterical persons, and those pathologically inclined in other directions, but they are also relatively easily produced in normal persons who show no other spontaneous automatism. I have made many experiments on these lines, and can confirm this observation. In the great majority of instances all that is required is enough patience to put up with an hour of quiet waiting. In most subjects, motor automatism will be obtained in a more or less high degree if contra-suggestions do not intervene as obstacles. In a relatively small percentage the phenomena arise spontaneously, *i.e.* directly under the influence of verbal suggestion or of some earlier auto-suggestion. In this instance the case is powerfully affected by suggestion. In general, the particular predisposition is subject to all those laws which also hold good for normal hypnosis. Nevertheless, certain special circumstances are to be taken into account, conditioned by the peculiarity of the case. It is not a question of a total hypnosis, but of a partial one, limited entirely to the motor area of the arm, like the cerebral anæsthesia produced by "magnetic passes" for a painful spot in the body. We touch the spot in question employing verbal suggestion or making use of some existing auto-suggestion, using the tactile stimulus which we know acts suggestively, to bring about the desired partial hypnosis. In accordance with this procedure, refractory subjects can be brought easily enough to an exhibition of automatism. The experimenter intentionally gives the table a slight push, or, better, a series of rhythmic but very slight taps. After a short time he notices that the oscillations become stronger, that they continue although he has interrupted his own intentional movements. The experiment has succeeded, the subject has unsuspectingly taken up the suggestion. By this procedure much more is obtained than by verbal suggestion. In very receptive persons and in all those cases where movement seems to arise spontaneously, the purposeful tremulous movements,^[28] not perceptible by the subject, assume the *rôle* of *agent provocateur*.

In this way persons who, by themselves, have never obtained automatic movements of a coarse calibre, sometimes assume the unconscious guidance of the table-movements, provided that the tremors are strong and that the medium understands their meaning. In this case the medium takes control of the slight oscillations and returns them considerably strengthened, but rarely at exactly the same instant, generally a few seconds later, in this way revealing the agent's conscious or unconscious thought. By means of this simple mechanism there may arise those cases of thought-reading so bewildering at first sight. A very simple experiment, that succeeds in many cases even with unpractised persons, will serve to illustrate

this. The experimenter thinks, say, of the number *four*, and then waits, his hands quietly resting on the table, until he feels that the table makes the first inclination to announce the number thought of. He lifts his hands off the table immediately, and the number *four* will be correctly tilted out. It is advisable in this experiment to place the table upon a soft thick carpet. By close attention the experimenter will occasionally notice a movement of the table which is thus represented.

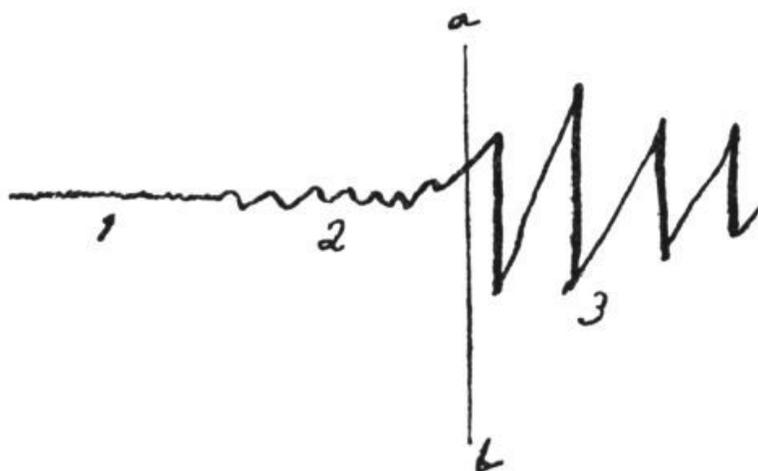


FIG. 2.

- (1) Purposeful tremors too slight to be perceived by the subject.
- (2) Several very small but perceptible oscillations of the table which indicate that the subject is responding to them.
- (3) The big movements (tilts) of the table, giving the number four that was thought of.
- (ab) Denotes the moment when the operator's hands are removed.

This experiment succeeds excellently with well-disposed but inexperienced subjects. After a little practice the phenomenon indicated is wont to disappear, since by practice the number is read and reproduced directly from the purposeful movements.^[29]

In a responsive medium these purposeful tremors of the experimenter act just as the intentional taps in the experiment cited above; they are received, strengthened and reproduced, although slightly wavering. Still they are perceptible and hence act suggestively as slight tactile stimuli, and by the increase of partial hypnosis give rise to great automatic movements. This experiment illustrates in the clearest way the increase step by step of auto-suggestion. Along the path of this auto-suggestion are developed all the automatic phenomena of a motor nature. How the intellectual content gradually mingles in with the purely motor need scarcely be elucidated after this discussion. There is no need of a special suggestion for the evoking of intellectual phenomena. From the outset it is a question of word-presentation, at least from the side of the experimenter. After the first aimless motor irrelevancies of the unpractised subject, some word-products or the intentions of the experimenter are soon reproduced. Objectively the occurrence of an intellectual content must be understood as follows:—

By the gradual increase of auto-suggestion the motor-range of the arm becomes isolated from consciousness, that is to say, the perception of the slight movement-impulse is concealed from consciousness.^[30]

By the knowledge gained from consciousness that some intellectual content is possible, there results a collateral excitation in the speech-area as the means immediately at hand for intellectual notification. The motor part of word-presentation is necessarily chiefly concerned with this aiming at notification.^[31] In this way we understand the unconscious flowing over of speech-impulse to the motor-area^[32] and conversely the gradual penetration of partial hypnosis into the speech-area.

In numerous experiments with beginners, as a rule I have observed at the beginning of intellectual phenomena a relatively large number of completely meaningless words, also often a series of meaningless single letters. Later on, all kinds of absurdities are produced, *e.g.* words or entire sentences with the letters irregularly misplaced or with the order of the letters all reversed—a kind of mirror-writing. The appearance of the letter or word indicates a new suggestion; some sort of association is involuntarily joined to it, which is then realised. Remarkably enough, these are not generally the conscious associations, but quite unexpected ones, a circumstance showing that a considerable part of the speech-area is already hypnotically isolated. The recognition of this automatism again forms a fruitful suggestion, since invariably at this moment the feeling of strangeness arises, if it is not already present in the pure motor-automatism. The question, "Who is doing this?" "Who is speaking?", is the suggestion for the synthesis of the unconscious personality which as a rule does not like being kept waiting too long. Any name is introduced, generally one charged with emotion, and the automatic splitting of the personality is accomplished. How accidental and how vacillating this synthesis is at its beginning, the following reports from the literature show. Myers^[33] communicates the following interesting observation on a Mr. A., a member of the Society for Psychical Research, who was making experiments on himself in automatic writing.

THIRD DAY.

Question: What is man?

Answer: TEFI H HASL ESBLE LIES.

Is that an anagram? Yes.

How many words does it contain? Five.

What is the first word? SEE.

What is the second word? SEEEE.

See? Shall I interpret it myself? Try to.

Mr. A. found this solution: "Life is less able." He was astonished at this intellectual information, which seemed to him to prove the existence of an intelligence independent of his own. Therefore he went on to ask:

Who are you? Clelia.
Are you a woman? Yes.
Have you ever lived upon the earth? No.
Will you come to life? Yes.
When? In six years.
Why are you conversing with me? E if Clelia el.
Mr. A. interpreted this answer as: I Clelia feel.

FOURTH DAY.

Question: Am I the one who asks the questions? Yes.
Is Clelia there? No.
Who is here then? Nobody.
Does Clelia exist at all? No.
With whom then was I speaking yesterday? With no one.

Janet^[34] conducted the following conversation with the subconsciousness of Lucie, who, meanwhile, was engaged in conversation with another observer. "M'entendez-vous?" asks Janet. Lucie answers by automatic writing, "Non." "Mais pour répondre il faut entendre?" "Oui, absolument." "Alors comment faites-vous?" "Je ne sais." "Il faut bien qu'il y ait quelqu'un qui m'entend?" "Oui." "Qui cela! Autre que Lucie. Eh bien! Une autre personne. Voulez-vous que nous lui donnions un nom?" "Non." "Si, ce sera plus commode," "Eh bien, Adrienne!" "Alors, Adrienne, m'entendez-vous?" "Oui."

From these quotations it will be seen in what way the subconscious personality is constructed. It owes its origin purely to suggestive questions meeting a certain disposition of the medium. The explanation is the result of the disintegration of the psychical complex; the feeling of the strangeness of such automatism then comes in to help, as soon as conscious attention is directed to the automatic act. Binet^[35] remarks on this experiment of Janet's: "Il faut bien remarquer que si la personnalité d'Adrienne a pu se créer, c'est qu'elle a rencontré une possibilité psychologique; en d'autres termes, il y avait là des phénomènes désagrégés vivant séparés de la conscience normale du sujet." The individualisation of the subconsciousness always denotes a considerable further step of great suggestive influence upon the further formation of automatism.^[36] So, too, we must regard the origin of the unconscious personalities in our case.

The objection that there is simulation in automatic table-turning may well be given up, when one considers the phenomenon of thought-reading from the purposeful tremors which the patient offered in such plenitude. Rapid, conscious thought-reading demands at the least an extraordinary degree of practice, which it has been shown the patient did not possess. By

means of the purposeful tremors whole conversations can be carried on, as in our case. In the same way the suggestibility of the subconscious can be proved objectively if, for instance, the experimenter with his hand on the table desires that the hand of the medium should no longer be able to move the table or the glass; contrary to all expectation and to the liveliest astonishment of the subject, the table will immediately remain immovable. Naturally any other desired suggestions can be realised, provided they do not overstep by their innervations the region of partial hypnosis; this proves at the same time the limited nature of the hypnosis. Suggestions for the legs and the other arm will thus not be obeyed. Table-turning was not an automatism which belonged exclusively to the patient's semi-somnambulism: on the contrary, it occurred in the most pronounced form in the waking state, and in most cases then passed over into semi-somnambulism, the appearance of this being generally announced by hallucinations, as it was at the first sitting.

2. *Automatic Writing*.—A second automatic phenomenon, which at the outset corresponds to a higher degree of partial hypnosis, is automatic writing. It is, according to my experience, much rarer and more difficult to produce than table-turning. As in table-turning, it is again a matter of a primary suggestion, to the conscious when sensibility is retained, to the unconscious when it is obliterated. The suggestion is, however, not a simple one, for it already bears in itself an intellectual element. "To write" means "to write something." This special element of the suggestion, which extends beyond the merely motor, often conditions a certain perplexity on the part of the subject, giving rise to slight contrary suggestions which hinder the appearance of the automatisms. I have observed in a few cases that the suggestion is realised, despite its relative venturesomeness (*e.g.* one directed towards the waking consciousness of a so-called normal person). However, it takes place in a peculiar way; it first displaces the purely motor part of the central system concerned in hypnosis, and the deeper hypnosis is then reached by auto-suggestion from the motor phenomenon, analogous to the procedure in table-turning described above. The subject,^[37] who has a pencil in his hand, is purposely engaged in conversation whilst his attention is diverted from the writing. The hand begins to make movements, beginning with many upward strokes and zigzag lines, or a simple line is made. Occasionally it happens that the pencil does not touch the paper, but writes in the air. These movements must be conceived as purely motor phenomena, which correspond to the expression of the motor element in the presentation "write." This phenomenon is somewhat rare; generally single letters are first written, and what was said above of table-turning holds true of their combination into words and sentences. True mirror-writing is also observed here and there. In the majority of cases, and perhaps in all experiments with beginners who are not under some very special suggestion, the automatic writing is that of the subject. Occasionally its character may be greatly changed,^[38] but this is secondary, and is always to be regarded as a symptom of the intruding synthesis of a subconscious personality.



FIG. 3.

As stated, the patient's automatic writing never came to any very great development. In these experiments, generally carried out in darkness, she passed over into semi-somnambulism, or into ecstasy. The automatic writing had thus the same effect as the preliminary table-turning.

3. *The Hallucinations.*—The nature of the passing into somnambulism in the second séance is of psychological importance. As stated, the automatic phenomena were progressing favourably when darkness came on. The most interesting event of this séance, so far, was the brusque interruption of the communication from the grandfather, which was the starting-point of various debates amongst the members of the circle. These two momentous occurrences, the darkness and the striking event, seem to have been the foundation for a rapid deepening of hypnosis, in consequence of which the hallucinations could be developed. The psychological mechanism of this process seems to be as follows. The influence of darkness upon the suggestibility of the sense-organs is well known.^[39] Binet^[40] states that it has a special influence on hysterics, producing a state of sleepiness. As is clear from the foregoing, the patient was in a state of partial hypnosis and had constituted herself one with the unconscious personality in closest relationship to her in the domain of speech. The automatic expression of this personality is interrupted most unexpectedly by a new person, of whose existence no one had any suspicion. Whence came this cleavage? Obviously the eager expectation of this first séance had very much occupied the patient. Her reminiscences of me and my family had probably grouped themselves around this expectation; hence these suddenly come to light at the climax of the automatic expression. That it was just my grandfather and no one else—not, *e.g.*, my deceased father, who, as she knew, was much closer to me than the grandfather whom I had never known—perhaps suggests where the origin of this new person is to be sought. It is probably a

dissociation of the personality already present which seized upon the material next at hand for its expression, namely, upon the associations concerning myself. How far this is parallel to the experiences revealed by dream investigation (Freud's^[41]) must remain undecided, for we have no means of judging how far the effect mentioned can be considered a "repressed" one. From the brusque interruption of the new personality, we may conclude that the presentations concerned were very vivid, with corresponding intensity of expectation. This perhaps was an attempt to overcome a certain maidenly shyness and embarrassment. This event reminds us vividly of the manner in which the dream presents to consciousness, by a more or less transparent symbolism, things one has never said to oneself clearly and openly. We do not know when this dissociation of the new personality occurred, whether it had been slowly prepared in the unconscious, or whether it first occurred in the séance. In any case, this event meant a considerable increase in the extension of the unconscious sphere rendered accessible through the hypnosis. At the same time this event must be regarded as powerfully suggestive in regard to the impression which it made upon the waking consciousness of the patient. For the perception of this unexpected intervention of a new power must inevitably excite a feeling of the strangeness of the automatisms, and would easily suggest the thought that an independent spirit is here making itself known. Hence the intelligible association that she would finally be able to see this spirit. The situation that ensued at the second séance is to be explained by the coincidence of this energising suggestion with the heightened suggestibility conditioned by the darkness. The hypnosis, and with it the series of dissociated presentations, break through to the visual area, and the expression of the unconscious, hitherto purely motor, is made objective, according to the measure of the specific energy of the new system, in the shape of visual images with the character of hallucinations; not as a mere accompanying phenomenon of the word-automatism, but as a substituted function. The explanation of the situation that arose in the first séance, at that time unexpected and inexplicable, is no longer presented in words, but as a descriptive allegorical vision. The sentence "they do not hate one another, but are friends," is expressed in a picture. We often encounter events of this kind in somnambulism. The thinking of somnambulists is given in plastic images which constantly break into this or that sense-sphere and are made objective in hallucinations. The process of

reflection sinks into the subconscious; only its end-results arise to consciousness either as presentations vividly tinged by the senses, or directly as hallucinations. In our case the same thing occurred as in the patient whose anæsthetic hand Binet pricked nine times, making her think of the figure 9; or as in Flournoy's^[42] Helen Smith, who, when asked during business-hours about certain patterns, suddenly saw the number of days (18) for which they had been lent, at a length of 20 mm. in front of her. The further question arises, why does the automatism appear in the visual and not in the acoustic sphere? There are several grounds for this choice of the visual sphere.

(1) The patient is not gifted acoustically; she is, for instance, very unmusical.

(2) There was no stillness corresponding to the darkness which might have favoured the appearance of sounds; there was a lively conversation.

(3) The increased conviction of the near presence of spirits, because the automatism felt so strange, could easily have aroused the idea that a spirit might be seen, thus causing a slight excitation of the visual sphere.

(4) The entoptic phenomena in darkness favoured the occurrence of hallucinations.

The reasons (3) and (4)—the entoptic phenomena in the darkness and the probable excitation of the visual sphere—are of decisive importance for the appearance of hallucinations. The entoptic phenomena in this case play the same rôle in the auto-suggestion, the production of the automatism, as the slight tactile stimuli in hypnosis of the motor centre. As stated, flashes preceded the first hallucinatory twilight-state. Obviously attention was already at a high pitch, and directed to visual perceptions, so that the retina's own light, usually very weak, was seen with great intensity. The part played by entoptic perceptions of light in the origin of hallucinations deserves further consideration. Schüle^[43] says: "The swarming of light and colour which stimulates and animates the field of vision, although in the dark, supplies the material for phantastic figures in the air before falling asleep. As we know, absolute darkness is never seen; a few particles of the dark field of vision are always illumined; flecks of light move here and there, and combine into all kinds of figures; it only needs a moderately active

imagination to create out of them, as one does out of clouds, certain known figures. The power of reasoning, fading as one falls asleep, leaves phantasy free play to construct very vivid figures. In the place of the light spots, haziness and changing colours of the dark visual field, there arise definite outlines of objects."^[44]

In this way hypnagogic hallucinations arise. The chief *rôle* naturally belongs to the imagination, hence imaginative people in particular are subject to hypnagogic hallucinations.^[45] The hypnopompic hallucinations described by Myers arise in the same way.

It is highly probable that hypnagogic pictures are identical with the dream-pictures of normal sleep—forming their visual foundation. Maury^[46] has proved from self-observation that the pictures which hovered around him hypnagogically were also the objects of the dreams that followed. G. Trumbull Ladd^[47] has shown this even more convincingly. By practice he succeeded in waking himself suddenly two to five minutes after falling asleep. He then observed that the figures dancing before the retina at times represented the same contours as the pictures just dreamed of. He even states that nearly every visual dream is shaped by the retina's own light-figures. In our case the fantastic rendering of these pictures was favoured by the situation. We must not underrate the influence of the over-excited expectation which allowed the dull retina-light to appear with increased intensity.^[48] The further formation of the retinal appearances follows in accordance with the predominating presentations. That hallucinations appear in this way has been also observed in other visionaries. Jeanne d'Arc^[49] first saw a cloud of light, and only after some time there stepped forth St. Michael, St. Catherine and St. Margaret. For a whole hour Swedenborg^[50] saw nothing but illuminated spheres and fiery flames. He felt a mighty change in the brain, which seemed to him "release of light." After the space of one hour he suddenly saw red figures which he regarded as angels and spirits. The sun visions of Benvenuto Cellini^[51] in Engelsburg are probably of the same nature. A student who frequently saw apparitions stated: "When these apparitions come, at first I only see single masses of light and at the same time am conscious of a dull noise in the ears. Gradually these contours become clear figures."

The appearance of hallucinations occurred in a quite classical way in Flournoy's Helen Smith. I quote the cases in question from his article.^[52]

"18 Mars. Tentative d'expérience dans l'obscurité. Mlle. Smith voit un ballon tantôt lumineux, tantôt s'obscurcissant.

"25 Mars. Mlle. Smith commence à distinguer de vagues lueurs, de longs rubans blancs, s'agitant du plancher au plafond, puis enfin une magnifique étoile qui dans l'obscurité s'est montrée à elle seule pendant toute la séance.

"1 Avril. Mlle. Smith se sent très agitée, elle a des frissons, est partiellement glacée. Elle est très inquiète et voit tout à coup se balançant au-dessus de la table une figure grimaçante et très laide avec de longs cheveux rouges. Elle voit alors un magnifique bouquet de roses de nuances diverses; tout à coup elle voit sortir de dessous le bouquet un petit serpent, qui, rampant doucement, vient sentir les fleurs, les regarde," etc.

Helen Smith^[53] says in regard to the origin of her vision of March:

"La lueur rouge persista autour de moi et je me suis trouvée entourée de fleurs extraordinaires."

At all times the complex hallucinations of visionaries have occupied a peculiar place in scientific criticism. Macario^[54] early separated these so-called intuition-hallucinations from others, since he maintains that they occur in persons of an eager mind, deep understanding and high nervous excitability. Hecker^[55] expresses himself similarly but more enthusiastically.

His view is that their condition is "the congenital high development of the spiritual organ which calls into active, free and mobile play the life of the imagination, bringing it spontaneous activity." These hallucinations are "precursors or signs of mighty spiritual power." The vision is "an increased excitation which is harmoniously adapted to the most complete health of mind and body." The complex hallucinations do not belong to the waking state, but prefer as a rule a partial waking state. The visionary is buried in his vision even to complete annihilation. Flournoy was also always able to prove in the visions of H.S. "un certain degré d'obnubilation." In our case the vision is complicated by a state of sleep whose peculiarities we shall review later.

THE CHANGE IN CHARACTER.

The most striking characteristic of the second stage in our case is the change in character. We meet many cases in the literature which have offered the symptom of spontaneous character-change. The first case in a scientific publication is Weir-Mitchell's^[56] case of Mary Reynolds.

This was the case of a young woman living in Pennsylvania in 1811. After a deep sleep of about twenty hours she had totally forgotten her entire past and everything she had learnt; even the words she spoke had lost their meaning. She no longer knew her relatives. Slowly she re-learnt to read and write, but her writing was from right to left. More striking still was the change in her character. Instead of being melancholy, she was now cheerful in the extreme. Instead of being reserved, she was buoyant and sociable. Formerly taciturn and retiring, she was now merry and jocose. Her disposition was totally changed.^[57]

In this state she renounced her former retired life and liked to undertake adventurous excursions unarmed, through wood and mountain, on foot and horseback. In one of these excursions she encountered a large black bear, which she took for a pig. The bear raised himself on his hind legs and gnashed his teeth at her. As she could not drive her horse on any further, she took an ordinary stick and hit the bear until it took to flight. Five weeks later, after a deep sleep, she returned to her earlier state with amnesia for the interval. These states alternated for about sixteen years. *But her last twenty-five years Mary Reynolds passed exclusively in her second state.*

Schroeder von der Kalk^[58] reports on the following case: The patient became ill at the age of sixteen with periodic amnesia, after a previous tedious illness of three years. Sometimes in the morning after waking she passed through a peculiar choreic state, during which she made rhythmical movements with her arms. Throughout the whole day she would then exhibit a childish, silly behaviour and lost all her educated capabilities. (When normal she is very intelligent, well-read, speaks French well.) In the second state she begins to speak faulty French. On the second day she is again at times normal. The two states are completely separated by amnesia.^[59]

Hoefelt^[60] reports on a case of spontaneous somnambulism in a girl who, in her normal state, was submissive and modest, but in somnambulism was impertinent, rude and violent. Azam's^[61] Felida was, in her normal state, depressed, inhibited, timid; and in the second state lively, confident, enterprising to recklessness. *The second state gradually became the chief one, and finally so far suppressed the first state that the patient called her normal states, lasting now but a short time, "crises."* The amnesic attacks had begun at 14½. In time the second state became milder and there was a certain approximation between the character of the two states. A very striking example of change in character is that worked out by Camuset, Ribot, Legrand du Saulle, Richer, Voisin, and put together by Bourru and Burot.^[62] It is that of Louis V., a severe male hysteric with amnesic alternating character. In the first stage he is rude, cheeky, querulous, greedy, thievish, inconsiderate. In the second state he is an agreeable, sympathetic character, industrious, docile and obedient. This amnesic change of character has been used by Paul Lindau^[63] in his drama "Der Andere" (The Other One).

Rieger^[64] reports on a case parallel to Lindau's criminal lawyer. The unconscious personalities of Janet's Lucie and Léonie (Janet, *l.c.*) and Morton Prince's^[65] may also be regarded as parallel with our case. There are, however, therapeutic artificial products whose importance lies in the domain of the dissociation of consciousness and of memory.

In the above cases, the second state is always separated from the first by an amnesic dissociation, and the change in character is, at times, accompanied by a break in the continuity of consciousness. In our case there is no amnesic disturbance; the passage from the first to the second stage follows quite gradually and the continuity of consciousness remains. The patient carries out in her waking state everything, otherwise unknown to her, from the field of the unconscious that she has experienced during hallucinations in the second stage.

Periodic changes in personality without amnesic dissociation are found in the region of *folie circulaire*, but are rarely seen in hysterics, as Renaudin's^[66] case shows. A young man, whose behaviour had always been excellent, suddenly began to display the worst tendencies. There were no symptoms of insanity, but, on the other hand, the whole surface of the body

was anæsthetic. This state showed periodic intervals, and in the same way the patient's character was subject to vacillations. As soon as the anæsthesia disappeared he was manageable and friendly. When the anæsthesia returned he was overcome by the worst instincts, which, it was observed, even included the wish to murder.

Remembering that our patient's age at the beginning of the disturbances was 14-1/2, that is, the age of puberty had just been reached, one must suppose that there was some connection between the disturbances and the physiological character-changes at puberty. "There appears in the consciousness of the individual during this period of life a new group of sensations, together with the feelings and ideas arising therefrom; this continuous pressure of unaccustomed mental states makes itself constantly felt because the cause is always at work; the states are co-ordinated because they arise from one and the same source, and must little by little bring about deep-seated changes in the ego."^[67] Vacillating moods are easily recognisable; the confused new, strong feelings, the inclination towards idealism, to exalted religiosity and mysticism, side by side with the falling back into childishness, all this gives to adolescence its prevailing character. At this epoch the human being first makes clumsy attempts at independence in every direction; for the first time uses for his own purposes all that family and school have contributed hitherto; he conceives ideals, constructs far-reaching plans for the future, lives in dreams whose content is ambitious and egotistic. This is all physiological. The puberty of a psychopathic is a crisis of more serious import. Not only do the psychophysical changes run a stormy course, but features of a hereditary degenerate character become fixed. In the child these do not appear at all, or but sporadically. For the explanation of our case we are bound to consider a specific disturbance of puberty. The reasons for this view will appear from a further study of the second personality. (For the sake of brevity we shall call the second personality IVENES—as the patient baptised her higher ego).

Ivenes is the exact continuation of the everyday ego. She includes the whole of her conscious content. In the semi-somnambolic state her intercourse with the real external world is analogous to that of the waking state, that is, she is influenced by recurrent hallucinations, but no more than persons who are subject to non-confusional psychotic hallucinations. The continuity of Ivenes obviously extends to the hysterical attack with its dramatic scenes,

visionary events, etc. During the attack itself she is generally isolated from the external world; she does not notice what is going on around her, does not know that she is talking loudly, etc. But she has no amnesia for the dream-content of her attack. Amnesia for her motor expressions and for the changes in her surroundings is not always present. That this is dependent upon the degree of intensity of her somnambulant state and that there is sometimes partial paralysis of individual sense organs is proved by the occasion when she did not notice me; her eyes were then open, and most probably she saw the others, although she only perceived me when I spoke to her. This is a case of so-called *systematised anæsthesia* (negative hallucination) which is often observed in hysterics.

Flournoy,^[68] for instance, reports of Helen Smith that during the séances she suddenly ceased to see those taking part, although she still heard their voices and felt their touch; sometimes she no longer heard, although she saw the movements of the lips of the speakers, etc.

Ivenes is just the continuation of the waking self. She contains the entire consciousness of S. W.'s waking state. Her remarkable behaviour tells decidedly against any analogy with cases of *double consciousness*. The characteristics of Ivenes contrast favourably with the patient's ordinary self. She is a calmer, more composed personality; her pleasing modesty and accuracy, her uniform intelligence, her confident way of talking must be regarded as an improvement of the whole being; thus far there is analogy with Janet's Léonie. But this is the extent of the similarity. Apart from the amnesia, they are divided by a deep psychological difference. Léonie II. is the healthier, the more normal; she has regained her natural capabilities, she shows remarkable improvement upon her chronic condition of hysteria. Ivenes rather gives the impression of a more artificial product; there is something thought out; despite all her excellences she gives the impression of playing a part excellently; her world-sorrow, her yearning for the other side of things, are not merely piety but the attributes of saintliness. Ivenes is no mere human, but a mystic being who only partly belongs to reality. The mournful features, the attachment to sorrow, her mysterious fate, lead us to the historic prototype of Ivenes—Justinus Kerner's "Prophetess of Prevorst." Kerner's book must be taken as known, and therefore I omit any references to these common traits. But Ivenes is no copy of the prophetess; she lacks the resignation and the saintly piety of the latter. The prophetess is

merely used by her as a study for her own original conception. The patient pours her own soul into the *rôle* of the prophetess, thus seeking to create an ideal of virtue and perfection. She anticipates her future. She incarnates in Ivenes what she wishes to be in twenty years—the assured, influential, wise, gracious, pious lady. It is in the construction of the second person that there lies the far-reaching difference between Léonie II. and Ivenes. Both are psychogenic. But Léonie I. receives in Léonie II. what really belongs to her, while S. W. builds up a person beyond herself. It cannot be said "she deceives herself" into, but that "she dreams herself" into the higher ideal state.^[69]

The realisation of this dream recalls vividly the psychology of the pathological cheat. Delbruck^[70] and Forel^[71] have indicated the importance of auto-suggestion in the formation of pathological cheating and reverie. Pick^[72] regards intense auto-suggestibility as the first symptom of the hysterical dreamer, making possible the realisation of the "day-dream." One of Pick's patients dreamt that she was in a morally dangerous situation, and finally carried out an attempt at rape on herself; she lay on the floor naked and fastened herself to a table and chairs. Or some dramatic person will be created with whom the patient enters into correspondence by letter, as in Bohn's case.^[73] The patient dreamt herself into an engagement with a totally imaginary lawyer in Nice, from whom she received letters which she had herself written in disguised handwriting. This pathological dreaming, with auto-suggestive deceptions of memory amounting to real delusions and hallucinations, is pre-eminently to be found in the lives of many saints.^[74]

It is only a step from the dreamlike images strongly stamped by the senses to the true complex hallucinations.^[75] In Pick's case, for instance, one sees that the patient, who persuades herself that she is the Empress Elizabeth, gradually loses herself in her dreams to such an extent that her condition must be regarded as a true "twilight" state. Later it passes over into hysterical delirium, when her dream-phantasies become typical hallucinations. The pathological liar, who becomes involved through his phantasies, behaves exactly like a child who loses himself in his play, or like the actor who loses himself in his part.^[76] There is here no fundamental distinction from somnambulant dissociation of personality, but only a difference of degree, which rests upon the intensity of the primary auto-

suggestibility or disintegration of the psychic elements. *The more consciousness becomes dissociated, the greater becomes the plasticity of the dream situation, the less becomes the amount of conscious lying and of consciousness in general.* This being carried away by interest in the object is what Freud calls *hysterical identification*. For instance, to Erler's^[77] acutely hysterical patient there appeared hypnagogically little riders made of paper, who so took possession of her imagination that she had the feeling of being herself one of them. Similar phenomena normally occur to us in dreams in general, in which we think like "hysterics."^[78]

The complete abandonment to the interesting image explains also the wonderful naturalness of pseudological or somnambulic representation—a degree unattainable in conscious acting. The less waking consciousness intervenes by reflection and reasoning, the more certain and convincing becomes the objectivation of the dream, e.g. the roof-climbing of somnambulists.

Our case has another analogy with *pseudologia phantastica*: *The development of the phantasies during the attacks.* Many cases are known in the literature where the pathological lying comes on in attacks and during serious hysterical trouble.^[79]

Our patient develops her systems exclusively in the attack. In her normal state she is quite incapable of giving any new ideas or explanations; she must either transpose herself into somnambulism or await its spontaneous appearance. This exhausts the affinity to *pseudologia phantastica* and to pathological dream-states.

Our patient's state is even differentiated from pathological dreaming, since it could never be proved that her dream-weavings had at any time previously been the objects of her interest during the day. Her dreams occur explosively, break forth with bewildering completeness from the darkness of the unconscious. Exactly the same was the case in Flournoy's Helen Smith. In many cases (see below), however, links with the perceptions of the normal states can be demonstrated: it seems therefore probable that the roots of every dream were originally images with an emotional accentuation, which, however, only occupied waking consciousness for a short time.^[80] We must allow that in the origin of such dreams hysterical forgetfulness^[81] plays a *part not to be underestimated*.

Many images are buried which would be sufficient to put the consciousness on guard; associated classes of ideas are lost and go on spinning their web in the unconscious, thanks to the psychic dissociation; this is a process which we meet again in the genesis of our dreams.

"Our conscious reflection teaches us that when exercising attention we pursue a definite course. But if that course leads us to an idea which does not meet with our approval, we discontinue and cease to apply our attention. Now, apparently, the chain of thought thus started and abandoned, may go on without regaining attention unless it reaches a spot of especially marked intensity, which compels renewed attention. An initial rejection, perhaps consciously brought about by the judgment on the ground of incorrectness or unfitness for the actual purpose of the mental act, may therefore account for the fact that a mental process continues unnoticed by consciousness until the onset of sleep."^[82]

In this way we may explain the apparently sudden and direct appearance of dream-states. The entire carrying over of the conscious personality into the dream-*rôle* involves indirectly the development of simultaneous automatisms. "Une seconde condition peut amener la division de conscience; ce n'est pas une altération de la sensibilité, c'est une attitude particulière de l'esprit, la concentration de l'attention pour un point unique; il résulte de cet état de concentration que l'esprit devient distrait pour la reste et en quelque sorte insensible, ce qui ouvre la carrière aux actions automatiques, et ces actions peuvent prendre un caractère psychique et constituer des intelligences parasites, vivant côte à côte avec la personnalité normale qui ne les connaît pas."^[83]

Our subject's romances throw a most significant light on the subjective roots of her dreams. They swarm with secret and open love-affairs, with illegitimate births and other sexual insinuations. The central point of all these ambiguous stories is a lady whom she dislikes, who is gradually made to assume the form of her polar opposite, and whilst Ivenes becomes the pinnacle of virtue, this lady is a sink of iniquity. *But her reincarnation doctrines, in which she appears as the mother of countless thousands, arises in its naïve nakedness from an exuberant phantasy which is, of course, very characteristic of the period of puberty. It is the woman's premonition of the sexual feeling, the dream of fruitfulness, which the*

patient has turned into these monstrous ideas. We shall not go wrong if we seek for the curious form of the disease in the teeming sexuality of this too-rich soil. Viewed from this standpoint, the whole creation of Ivenes, with her enormous family, is nothing but a dream of sexual wish-fulfilment, differentiated from the dream of a night only in that it persists for months and years.

RELATION TO THE HYSTERICAL ATTACK.

So far one point in S. W.'s history has remained unexplained, and that is her attack. In the second séance she was suddenly seized with a sort of fainting fit, from which she awoke with a recollection of various hallucinations. According to her own statement, she had not lost consciousness for a moment. Judging from the external symptoms and the course of the attack, one is inclined to regard it as a *narcolepsy*, or rather a *lethargy*; such, for example, as Loewenfeld has described, and the more readily as we know that previously one member of her family (her grandmother) has had an attack of lethargy. It is possible to imagine that the *lethargic disposition* (Loewenfeld) had descended to our subject. In spiritualistic séances it is not usual to see hysterical convulsions. Our subject showed no sort of convulsive symptoms, but in their place, perhaps, the peculiar sleeping-states. Ætiologically, at the outset, two moments must be taken into consideration:

1. The irruption of hypnosis.
2. The psychic stimulation.

1. *Irruption of Partial Hypnosis.*—Janet observes that the subconscious automatisms have a hypnotic influence and can bring about complete somnambulism. ^[84]

He made the following experiment: While the patient, who was in the completely waking state, was engaged in conversation by a second observer, Janet stationed himself behind her and by means of whispered suggestions made her unconsciously move her hand and by written signs give an answer to questions. Suddenly the patient broke off the conversation, turned round and with her supraliminal consciousness

continued the previously subconscious talk with Janet. She had fallen into hypnotic somnambulism.^[85]

There is here a state of affairs similar to our patient's. But it must be noted that, for certain reasons discussed later, the sleeping state is not to be regarded as hypnotic. We therefore come to the question of—

2. *The Psychic Stimulation.*—It is told of Bettina Brentano that the first time she met Goethe she suddenly fell asleep on his knee.^[86]

This ecstatic sleep in the midst of extremest torture, the so-called "witch-sleep," is well known in the history of trials for witchcraft.^[87]

With susceptible subjects relatively insignificant stimuli suffice to bring about the somnambulant state. Thus a sensitive lady had to have a splinter cut out of her finger. Without any kind of bodily change she suddenly saw herself sitting by the side of a brook in a beautiful meadow, plucking flowers. This condition lasted as long as the slight operation and then disappeared spontaneously.^[88]

Loewenfeld^[89] has noticed unintentional inducement of hysterical lethargy through hypnosis.

Our case has certain resemblances to hysterical lethargy^[90] as described by Loewenfeld, viz. the shallow breathing, the diminution of the pulse, the corpse-like pallor of the face, and further the peculiar feeling of dying and the thoughts of death.^[91]

The retention of one sense is not inconsistent with lethargy: thus in certain cases of trance the sense of hearing remains.^[92]

In Bonamaison's^[93] case not only was the sense of touch retained, but the senses of hearing and smell were quickened. The hallucinatory content and loud speaking is also met with in persons with hallucinations in lethargy.^[94] Usually there prevails total amnesia for the lethargic interval. Loewenfeld's^[95] case D. had, however, a fleeting recollection; in Bonamaison's case there was no amnesia. Lethargic patients do not prove susceptible to the usual waking stimuli, but Loewenfeld succeeded with his patient St. in turning the lethargy into hypnosis by means of mesmeric passes, thus combining it with the rest of consciousness during the attack.

[96] Our patient showed herself absolutely unsusceptible in the beginning of the lethargy, but later on she began to speak spontaneously, was incapable of giving any attention when her somnambolic ego was speaking, but could attend when it was one of her automatic personalities. In this last case it is probable that the hypnotic effect of the automatism succeeded in achieving a partial transformation of the lethargy into hypnosis. When we consider that, according to Loewenfeld's view, the lethargic disposition must not be "too readily identified with the peculiar condition of the nervous apparatus in hysteria," then the idea of the family heredity of this disposition in our case becomes not a little probable. The disease is much complicated by these attacks.

So far we have seen that the patient's consciousness of her ego is identical in all the states. We have discussed two secondary complexes of consciousness and have followed them into the somnambolic attack, where they appear as the patient's vision when she had lost her motor activity during the attack. During the next attacks she was impervious to any external incidents, but on the other hand developed, within the twilight state, all the more intense activity, in the form of visions. It seems that many secondary series of ideas must have split off quite early from the primary unconscious personality, for already, after the first two séances, "spirits" appeared by the dozen. The names were inexhaustible in variety, but the differences between the personalities were soon exhausted and it became apparent that they could all be subsumed under two types, the *serio-religious* type and the *gay-hilarious*. So far it was really only a matter of *two different unconscious personalities*, which appeared under different names but had no essential differences. The older type, the grandfather, who had initiated the automatism, also first began to make use of the twilight state. I am not able to remember any suggestion which might have given rise to the automatic speaking. According to the preceding view, the attack in such circumstances might be regarded as a partial auto-hypnosis. The ego-consciousness which remains and, as a result of its isolation from the external world, occupies itself entirely with its hallucinations, is what is left over of the waking consciousness. Thus the automatism has a wide field for its activity. The independence of the individual central spheres which we have proved at the beginning to be present in the patient, makes the automatic act of speaking appear intelligible. Just as the dreamer on

occasion speaks in his sleep, so, too, a man in his waking hours may accompany intensive thought with an unconscious whisper.^[97] The peculiar movements of the speech-musculature are to be noted. They have also been observed in other somnambulists.^[98]

These clumsy attempts must be directly paralleled with the unintelligent and clumsy movements of the table or glass, and most probably correspond to the *preliminary activity* of the motor portion of the presentation; that is to say, a stimulus limited to the motor-centre which has not previously been subordinated to any higher system. Whether the like occurs in persons who talk in their dreams, I do not know. But it has been observed in hypnotised persons.^[99]

Since the convenient medium of speech was used as the means of communication, the study of the subconscious personalities was considerably lightened. Their intellectual compass is a relatively mediocre one. Their knowledge is greater than that of the waking patient, including also a few occasional details, such as the birthdays of dead strangers and the like. The source of these is more or less obscure, since the patient does not know whence in the ordinary way she could have procured the knowledge of these facts. These are cases of so-called cryptomnesia, which are too unimportant to deserve more extended notice. The intelligence of the two subconscious persons is very slight; they produce banalities almost exclusively, but their relation to the conscious ego of the patient when in the somnambulant state is interesting. They are invariably aware of everything that takes place during ecstasy and occasionally they render an exact report from minute to minute.^[100]

The subconscious persons only know the patient's phantastic changes of thought very superficially; they do not understand these and cannot answer a single question concerning the situation. Their stereotyped reference to Ivenes is: "Ask Ivenes." This observation reveals a dualism in the character of the subconscious personalities difficult to explain; for the grandfather, who gives information by automatic speech, also appears to Ivenes and, according to her account, teaches her about the objects in question. How is it that, when the grandfather speaks through the patient's mouth, he knows nothing of the very things which he himself teaches her in the ecstasies?

We must again return to the discussion of the first appearance of the hallucinations. We picture the vision, then, as an irruption of hypnosis into the visual sphere. That irruption does not lead to a "normal" hypnosis, but to a "hystero-hypnosis," that is, the simple hypnosis is complicated by a hysterical attack.

It is not a rare occurrence in the domain of hypnotism for normal hypnosis to be disturbed, or rather to be replaced by the unexpected appearance of hysterical somnambulism; the hypnotist in many cases then loses rapport with the patient. In our case the automatism arising in the motor area plays the part of hypnotist; the suggestions proceeding from it (called objective auto-suggestions) hypnotise the neighbouring areas in which a certain susceptibility has arisen. At the moment when the hypnotism flows over into the visual sphere, the hysterical attack occurs which, as remarked, effects a very deep-reaching change in a large portion of the psychical region. We must now suppose that the automatism stands in the same relationship to the attack as the hypnotist to a pathological hypnosis; its influence upon the further structure of the situation is lost. The hallucinatory appearance of the hypnotised personality, or rather of the suggested idea, may be regarded as the last effect upon the somnambulant personality. Thenceforward the hypnotist becomes only a figure with whom the somnambulant personality occupies itself independently: he can only state what is going on and is no longer the *conditio sine qua non* of the content of the somnambulant attack. The independent ego-complex of the attack, in our case Ivenes, has now the upper hand. She groups her own mental products around the personality of the hypnotiser, that is, of the grandfather, now degraded to a mere image. In this way we are enabled to understand the dualism in the character of the grandfather. *The grandfather I. who speaks directly to those present, is a totally different person and a mere spectator of his double, grandfather II., who appears as Ivenes' teacher.* Grandfather I. maintains energetically that both are one and the same person, and that I. has all the knowledge which II. possesses, and is only prevented from giving information by the difficulties of speech. (The dissociation was of course not realized by the patient, who took both to be one person.) Grandfather I., if closely examined, however, is not altogether wrong, judging from one fact which seems to make for the identity of I. and II., viz. that they are never both present together. When I. speaks automatically, II. is not present; Ivenes remarks on his absence. Similarly,

during the ecstasy, when she is with II., she cannot say where I. is, or she may learn only on returning from an imaginary journey that meanwhile I. has been guarding her body. Conversely I. never says that he is going on a journey with Ivenes and never explains anything to her. This behaviour should be noted, for if I. is really separate from II., there seems no reason why he should not speak automatically at the same time that II. appears, and be present with II. in the ecstasy. Although this might have been supposed possible, as a matter of fact it was never observed. How is this dilemma to be resolved? At all events there exists an identity of I. and II., but it does not lie in the region of the personality under discussion; it lies in the basis common to both; that is, in the personality of the subject which in deepest essence is one and indivisible. Here we come across the characteristic of all hysterical dissociations of consciousness. *They are disturbances which only belong to the superficial, and none reaches so deep as to attack the strong-knit foundation of the ego-complex.*

In many such cases we can find the bridge which, although often well-concealed, spans the apparently impassable abyss. For instance, by suggestion, one of four cards is made invisible to a hypnotised person; he thereupon names the other three. A pencil is placed in his hand with the instruction to write down all the cards lying there; he correctly adds the fourth one.^[101]

In the aura of his hystero-epileptic attacks a patient of Janet's^[102] invariably had a vision of a conflagration, and whenever he saw an open fire he had an attack; indeed, the sight of a lighted match was sufficient to bring about an attack. The patient's visual field on the left side was limited to 30°, the right eye was shut. The left eye was fixed in the middle of a perimeter whilst a lighted match was held at 80°. The hystero-epileptic attack took place immediately. Despite the extensive amnesia in many cases of double consciousness, the patients' behaviour does not correspond to the degree of their ignorance, but it seems rather as if a deeper instinct guided their actions in accordance with their former knowledge. Not only this relatively slight amnesic dissociation, but the severe amnesia of the epileptic twilight-state, formerly regarded as *irreparabile damnum*, does not suffice to cut the inmost threads which bind the ego-complex in the twilight-state to the normal ego. In one case the content of the twilight-state could be grafted on to the waking ego-complex.^[103]

Making use of these experiments for our case, we obtain the helpful hypothesis that those layers of the unconscious beyond reach of the dissociation endeavour to present the unity of automatic personality. This endeavour is shattered in the deeper-seated and more elemental disturbance of the hysterical attack,^[104] which prevents a more complete synthesis by the tacking on of associations which are to a certain extent the most original individual property of supraliminal personality. *As the Ivenes dream emerged it was fitted on to the figures accidentally in the field of vision, and henceforth remains associated with them.*

RELATIONSHIP TO THE UNCONSCIOUS PERSONALITY.

As we have seen, the numerous personalities become grouped round two types, the grandfather and Ulrich von Gerbenstein. The first produces exclusively sanctimonious religiosity and gives edifying moral precepts. The latter is, in one word, a "flapper," in whom there is nothing male except the name. We must here add from the anamnesis that at fifteen the patient was confirmed by a very bigoted clergyman, and at home she is occasionally the recipient of sanctimonious moral talks. The grandfather represents this side of her past, Gerbenstein the other half; hence the curious contrast. Here we have personified the chief characteristics of her past. On the one hand the sanctimonious person with a narrow education, on the other the boisterousness of a lively girl of fifteen who often overshoots the mark.^[105] We find both sets of traits mixed in the patient in sharp contrast. At times she is anxious, shy, and extremely reserved; at others boisterous to a degree. She is herself often most painfully aware of these contradictions. This circumstance gives us the key to the source of the two unconscious personalities. The patient is obviously seeking a middle path between the two extremes; she endeavours to repress them and strains after some ideal condition. These strainings bring her to the puberty dream of the ideal Ivenes, beside whose figure the unacknowledged trends of her character recede into the background. They are not lost, however, but as repressed ideas, analogous to the Ivenes idea, begin an independent existence as automatic personalities.

S. W.'s behaviour recalls vividly Freud's^[106] investigations into dreams which disclose the independent growth of repressed thoughts. We can now

comprehend why the hallucinatory persons are separated from those who write and speak automatically. The former teach Ivenes the secrets of the Other Side, they relate all those phantastic tales about the extraordinariness of her personality, they create scenes where Ivenes can appear dramatically with the attributes of power, wisdom and virtue. These are nothing but dramatic dissociations of her dream-self. The latter, the automatic persons, are the ones to be overcome, they must have no part in Ivenes. With the spirit-companions of Ivenes they have only the name in common. *A priori*, it is not to be expected that in a case like ours, where these divisions are never clearly defined, that two such characteristic individualities should disappear entirely from a somnambulic ego-complex having so close a relation with the waking consciousness. And in fact, we do meet them in part in those ecstatic penitential scenes and in part in the romances crammed with more or less banal, mischievous gossip.

COURSE.

It only remains to say a few words about the course of this strange affection. The process reached its maximum in four to eight weeks. The descriptions given of Ivenes and of the unconscious personalities belong generally to this period. Thenceforth a gradual decline was noticeable; the ecstasies grew meaningless and the influence of Gerbenstein became more powerful. The phenomena gradually lost their distinctive features, the characters which were at first well demarcated became by degrees inextricably mixed. The psychological contribution grew smaller and smaller until finally the whole story assumed a marked effect of fabrication. Ivenes herself was much concerned about this decline; she became painfully uncertain, spoke cautiously, feeling her way, and allowed her character to appear undisguised. The somnambulic attacks decreased in frequency and intensity. All degrees from somnambulism to conscious lying were observable. Thus the curtain fell. The patient has since gone abroad. We should not underestimate the importance of the fact that her character has become pleasanter and more stable. Here we may recall the cases cited in which the second state gradually replaced the first state. Perhaps this is a similar phenomenon.

It is well known that somnambulatory manifestations sometimes begin at puberty.^[107] The attacks of somnambulism in Dyce's case^[108] began immediately before puberty and lasted just till its termination. The somnambulism of H. Smith is likewise closely connected with puberty.^[109]

Schroeder von der Kalk's patient was 16 years old at the time of her illness; Felida 14-1/2, etc. We know also that at this period the future character is formed and fixed. In the case of Felida and of Mary Reynolds we saw that the character in state II. replaced that of state I. *It is not therefore unthinkable that these phenomena of double consciousness are nothing but character-formations for the future personality, or their attempts to burst forth.* In consequence of special difficulties (unfavourable external conditions, psychopathic disposition of the nervous system, etc.), *these new formations, or attempts thereat, become bound up with peculiar disturbances of consciousness.* Occasionally the somnambulism, in view of the difficulties that oppose the future character, takes on a marked teleological meaning, for it gives the individual, who might otherwise be defeated, the means of victory. Here I am thinking first of all of Jeanne d'Arc, whose extraordinary courage recalls the deeds of Mary Reynolds' II. This is perhaps the place to point out the similar function of the "hallucination téléologique" of which the public reads occasionally, although it has not yet been submitted to a scientific study.

THE UNCONSCIOUS ADDITIONAL CREATIVE WORK.

We have now discussed all the essential manifestations offered by our case which are of significance for its inner structure. Certain accompanying manifestations may be briefly considered: *the unconscious additional creative work.* Here we shall encounter a not altogether unjustifiable scepticism on the part of the representative of science. Dessoir's conception of a second ego met with much opposition, and was rejected, as too impossible in many directions. As is known, occultism has proclaimed a pre-eminent right to this field and has drawn premature conclusions from doubtful observations. We are indeed very far from being in a position to state anything conclusive, since we have at present only most inadequate material. Therefore if we touch on the field of the unconscious additional creative work, it is only that we may do justice to all sides of our case. *By*

unconscious addition we understand that automatic process whose result does not penetrate to the conscious psychic activity of the individual. To this region above all belongs thought-reading through table movements. I do not know whether there are people who can divine a whole long train of thought by means of inductions from the intentional tremulous movements. It is, however, certain that, assuming this to be possible, such persons must be availing themselves of a routine achieved after endless practice. But in our case long practice can be excluded without more ado, and there is nothing left but to accept a primary susceptibility of the unconscious, far exceeding that of the conscious.

This supposition is supported by numerous observations on somnambulists. I will mention only Binet's^[110] experiments, where little letters or some such thing, or little complicated figures in relief were laid on the anæsthetic skin of the back of the hand or the neck, and the unconscious perceptions were then recorded by means of signs. On the basis of these experiments he came to the following conclusion: "D'après les calculs que j'ai pu faire, la sensibilité inconsciente d'une hystérique est à certains moments *cinquante fois* plus fine que celle d'une personne normale." A second additional creation coming under consideration in our case and in numerous other somnambulists, is that condition which French investigators call "cryptomnesia."^[111] By this term is meant the becoming conscious of a memory-picture which cannot be regarded as in itself primary, but at most is secondary, by means of subsequent recalling or abstract reasoning. It is characteristic of cryptomnesia that the picture which emerges does not bear the obvious mark of the memory-picture, is not, that is to say, bound up with the idiosyncratic super-conscious ego-complex.

Three ways may be distinguished in which the cryptomnesic picture is brought to consciousness.

1. *The picture enters consciousness without any intervention of the sense-spheres (intra-psychically).* It is an intruding idea whose causal sequence is hidden within the individual. In so far cryptomnesia is quite an everyday occurrence, concerned with the deepest normal psychic events. How often it misleads the investigator, the author or the composer into believing his ideas original, whilst the critic quite well recognises their source! Generally the individuality of the representation protects the author from the

accusation of plagiarism and proves his good faith; still, cases do occur of unconscious verbal reproduction. Should the passage in question contain some remarkable idea, the accusation of plagiarism, more or less conscious, is justified. After all, a valuable idea is linked by numerous associations with the ego-complex; at different times, in different situations, it has already been meditated upon and thus leads by innumerable links in all directions. It can therefore never so disappear from consciousness that its continuity could be entirely lost from the sphere of conscious memory. We have, however, a criterion by which we can always recognise objectively intra-psychic cryptomnesia. The cryptomnesic presentation is linked to the ego-complex by the minimum of associations. The reason for this lies in the relation of the individual to the particular object, in the disproportion of interest to object. Two possibilities occur: (1) The object is worthy of interest but the interest is slight in consequence of dispersion or want of understanding; (2) The object is not worthy of interest, consequently the interest is slight. In both cases an extremely labile connection with consciousness arises which leads to a rapid forgetting. The slight bridge is soon destroyed and the acquired presentation sinks into the unconscious, where it is no longer accessible to consciousness. Should it enter consciousness by means of cryptomnesia, the feeling of strangeness, of its being an original creation, will cling to it because the path by which it entered the subconscious has become undiscoverable. Strangeness and original creation are, moreover, closely allied to one another if one recalls the numerous witnesses in *belles-lettres* to the nature of genius ("possession" by genius).^[112]

Apart from certain striking cases of this kind, where it is doubtful whether it is a cryptomnesia or an original creation, there are some cases in which a passage of no essential content is reproduced, and that almost verbally, as in the following example:—

About that time when Zarathustra lived on the blissful islands, it came to pass that a ship cast anchor at that island on which the smoking mountain standeth; and the sailors of that ship went ashore in order to shoot rabbits! But about the hour of noon, when the captain and his men had mustered again, they suddenly saw a man come through the air unto them, and a voice said distinctly: "It is time! It is high time!" But when that person was nighest unto them (he passed by them flying

quickly like a shadow, in the direction in which the volcano was situated) they recognised with the greatest confusion that it was Zarathustra. For all of them, except the captain, had seen him before, and they loved him, as the folk love, blending love and awe in equal parts. "Lo! there," said the old steersman, "Zarathustra goeth unto hell!"

An extract of awe-inspiring import from the log of the ship "Sphinx" in the year 1686, in the Mediterranean.

Just. Kerner, "Blätter aus Prevorst," vol. IV., p, 57.

The four captains and a merchant, Mr. Bell, went ashore on the island of Mount Stromboli to shoot rabbits. At three o'clock they called the crew together to go aboard, when, to their inexpressible astonishment, they saw two men flying rapidly over them through the air. One was dressed in black, the other in grey. They approached them very closely, in the greatest haste; to their greatest dismay they descended amid the burning flames into the crater of the terrible volcano, Mount Stromboli. They recognised the pair as acquaintances from London.

Frau E. Förster-Nietzsche, the poet's sister, told me, in reply to my inquiry, that Nietzsche took up Just. Kerner between the age of twelve and fifteen, when stopping with his grandfather, Pastor Oehler, in Pobler, but certainly never afterwards. It could never have been the poet's intention to commit a plagiarism from a ship's log; if this had been the case, he would certainly have omitted the very prosaic "to shoot rabbits," which was, moreover, quite unessential to the situation. In the poetical sketch of Zarathustra's journey into Hell there was obviously interpolated, half or wholly unconsciously, that forgotten impression from his youth.

This is an instance which shows all the peculiarities of cryptomnesia. A quite unessential detail, which deserves nothing but speedy forgetting, is reproduced with almost verbal fidelity, whilst the chief part of the narrative is, one cannot say altered, but recreated quite distinctively. To the distinctive core, the idea of the journey to Hell, there is added a detail, the old, forgotten impression of a similar situation. The original is so absurd that the youth, who read everything, probably skipped through it, and certainly had no deep interest in it. Here we get the required minimum of

associated links, for we cannot easily conceive a greater jump, than from that old, absurd story to Nietzsche's consciousness in the year 1883. If we picture to ourselves Nietzsche's mood at the time when "Zarathustra" was composed,^[113] and think of the ecstasy that at more than one point approached the pathological, we shall comprehend the abnormal reminiscence. The second of the two possibilities mentioned, the acceptance of some object, not itself uninteresting, in a state of dispersion or half interest from lack of understanding, and its cryptomnesic reproduction we find chiefly in somnambulists; it is also found in the literary chronicles dealing with dying celebrities.^[114]

Amid the exhaustive selection of these phenomena we are chiefly concerned with *talking in a foreign tongue, the so-called glossolalia*. This phenomenon is mentioned everywhere when it is a question of similar ecstatic conditions. In the New Testament, in the *Acta Sanctorum*,^[115] in the Witchcraft Trials, more recently in the Prophetess of Prevorst, in Judge Edmond's daughter Laura, in Flournoy's Helen Smith. The last is unique from the point of view of investigation; it is found also in Bresler's^[116] case, which is probably identical with Blumhardt's^[117] Gottlieben Dittus. As Flournoy shows, glossolalia is, so far as it really is independent speech, a cryptomnesic phenomenon, [Greek: Kat' exochên]. The reader should consult Flournoy's most interesting exposition.

In our case glossolalia was only once observed, when the only understandable words were the scattered variations on the word "vena." The source of this word is clear. A few days previously the patient had dipped into an anatomical atlas for the study of the veins of the face, which were given in Latin. She had used the word "vena" in her dreams, as happens occasionally to normal persons. The remaining words and sentences in a foreign language betray, at the first glance, their derivation from French, in which the patient was somewhat fluent. Unfortunately I am without the more accurate translations of the various sentences, because the patient would not give them; but we may hold that it was a phenomenon similar to Helen Smith's Martian language. Flournoy found that the Martian language was nothing but a childish translation from French; the words were changed but the syntax remained the same. Even more probable is the view that the patient simply ranged next to each other meaningless words that rang strangely, without any true word-formation,^[118] she borrowed certain

characteristic sounds from French and Italian and combined them into a kind of language, just as Helen Smith completed the *lacunæ* in the real Sanscrit words by products of her own resembling that language. The curious names of the mystical system can be reduced, for the most part, to known roots. The writer vividly recalls the botanical schemes found in every school atlas; the internal resemblance of the relationship of the planets to the sun is also pretty clear; we shall not be going astray if we see in the names reminiscences from popular astronomy. Thus can be explained the names Persus, Fenus, Nenus, Sirum, Surus, Fixus, and Pix, as the childlike distortions of Perseus, Venus, Sirius and Fixed Star, analogous to the Vena variations. Magnesor vividly recalls Magnetism, whose mystic significance the patient knew from the Prophetess of Prevorst. In Connesor, the contrary to Magnesor, the prefix "con" is probably the French "contre." Hypnos and Hyfonismus recall hypnosis and hypnotism (German *hypnotismus*), about which there are the most superstitious ideas circulating in lay circles. The most used suffixes in "us" and "os" are the signs by which as a rule people decide the difference between Latin and Greek. The other names probably spring from similar accidents to which we have no clues. The rudimentary glossolalia of our case has not any title to be a classical instance of cryptomnesia, for it only consisted in the unconscious use of various impressions, partly optical, party acoustic, and all very close at hand.

2. *The cryptomnesic image arrives at consciousness through the senses (as a hallucination)*. Helen Smith is the classic example of this kind. I refer to the case mentioned on the date "18 Mars."^[119]

3. *The image arrives at consciousness by motor automatism.* H. Smith had lost her valuable brooch, which she was anxiously looking for everywhere. Ten days later her guide Leopold informed her by means of the table where the brooch was. Thus informed, she found it at night-time in the open field, covered by sand.^[120] Strictly speaking, in cryptomnesia there is not any additional creation in the true sense of the word, since the conscious memory experiences no increase of its function, but only an enrichment of its content. By the automatism certain regions are merely made accessible to consciousness in an indirect way, which were formerly sealed against it. But the unconscious does not thereby accomplish any creation which exceeds the capacity of consciousness qualitatively or quantitatively. Cryptomnesia is only an apparent additional creation, in contrast to hypermnesia, which actually represents an increase of function.^[121]

We have spoken above of a receptivity of the unconscious greater than that of the consciousness, chiefly in regard to the simple attempts at thought-reading of numbers. As mentioned, not only our somnambulist but a relatively large number of normal persons are able to guess from the tremors lengthy thought-sequences, if they are not too complicated. These experiments are, so to speak, the prototype of those rarer and incomparably more astonishing cases of intuitive knowledge displayed at times by somnambulists.^[122] Zschokke^[123] in his "Introspection" has shown us that these phenomena do not belong only to the domain of somnambulism, but occur among non-somnambulic persons. The formation of such knowledge seems to be arrived at in various ways: first and foremost there is the fineness, already noted, of unconscious perceptions; then must be emphasised the importance of the enormous suggestibility of somnambulists. *The somnambulist not only incorporates every suggestive idea to some extent, but actually lives in the suggestion, in the person of his doctor or observer, with that abandonment characteristic of the suggestible hysteric.* The relation of Frau Hauffe to Kerner is a striking example of this. That in such cases there is a high degree of *association-concordance* can cause no astonishment; a condition which Richet might have taken more account of in his experiments in thought-transference. Finally there are cases of somnambulic additional creative work which are not to be explained solely by hyperæsthesia of the unconscious activity of the senses and association-concordance, but presuppose a highly developed

intellectual activity of the unconscious. The deciphering of the purposive tremors demand an extreme sensitiveness and delicacy of feeling, both psychological and physiological, to combine the individual perceptions into a complete unity of thought, if it is at all permissible to make an analogy between the processes of cognition in the realm of the unconscious and the conscious. The possibility must always be considered that *in the unconscious, feeling and concept are not clearly separated*, perhaps even are one. The intellectual elevation which certain somnambulists display in ecstasy, though a rare thing, is none the less one that has sometimes been observed.^[124] I would designate the scheme composed by our patient as just one of those pieces of creative work that exceed the normal intelligence. We have already seen whence one portion of this scheme probably came. A second source is no doubt the life-crisis of Frau Hauffe, portrayed in Kerner's book. The external form seems to be determined by these adventitious facts. As already observed in the presentation of the case, the idea of dualism arises from the conversations picked up piecemeal by the patient during those dreamy states occurring after her ecstasies. This exhausts my knowledge of the sources of S. W.'s creations. Whence arose the root-idea the patient is unable to say. I naturally examined occultistic literature pertinent to the subject, and discovered a store of parallels with her gnostic system from different centuries scattered through all kinds of work mostly quite inaccessible to the patient. Moreover, at her youthful age, and with her surroundings, the possibility of any such study is quite excluded. A brief survey of the system in the light of her own explanations shows how much intelligence was used in its construction. How highly the intellectual work is to be estimated is a matter of opinion. In any case, considering her youth, her mentality must be regarded as quite extraordinary.

CHAPTER II

THE ASSOCIATION METHOD

LECTURE I^[125]

When you honoured me with an invitation to lecture at Clark University, a wish was expressed that I should speak about my methods of work, and especially about the psychology of childhood. I hope to accomplish this task in the following manner:—

In my first lecture I will give to you the view points of my association methods; in my second I will discuss the significance of the familiar constellations; while in my third lecture I shall enter more fully into the psychology of the child.

I might confine myself exclusively to my theoretical views, but I believe it will be better to illustrate my lectures with as many practical examples as possible. We will therefore occupy ourselves first with the association test which has been of great value to me both practically and theoretically. The history of the association method in vogue in psychology, as well as the method itself, is, of course, so familiar to you that there is no need to enlarge upon it. For practical purposes I make use of the following formula:

1. head
2. green
3. water
4. to sing
5. dead
6. long
7. ship
8. to pay
9. window

10. friendly
11. to cook
12. to ask
13. cold
14. stem
15. to dance
16. village
17. lake
18. sick
19. pride
20. to cook
21. ink
22. angry
23. needle
24. to swim
25. voyage
26. blue
27. lamp
28. to sin
29. bread
30. rich
31. tree
32. to prick
33. pity

34. yellow
35. mountain
36. to die
37. salt
38. new
39. custom
40. to pray
41. money
42. foolish
43. pamphlet
44. despise
45. finger

46. expensive
47. bird
48. to fall
49. book
50. unjust
51. frog
52. to part
53. hunger
54. white
55. child
56. to take care
57. lead pencil
58. sad
59. plum
60. to marry
61. house
62. dear
63. glass
64. to quarrel
65. fur
66. big

67. carrot
68. to paint
69. part
70. old
71. flower
72. to beat
73. box
74. wild
75. family
76. to wash
77. cow
78. friend
79. luck
80. lie
81. department

82. narrow
83. brother
84. to fear
85. stork
86. false
87. anxiety
88. to kiss
89. bride
90. pure
91. door
92. to choose
93. hay
94. contented
95. ridicule
96. to sleep
97. month
98. nice
99. woman
100. to abuse

This formula has been constructed after many years of experience. The words are chosen and partially arranged in such a manner as to strike easily almost all complexes which occur in practice. As shown above, there is a regulated mixing of the grammatical qualities of the words. For this there are definite reasons. ^[126]

Before the experiment begins the test person receives the following instruction: "Answer as quickly as possible with the first word that occurs to your mind." This instruction is so simple that it can easily be followed. The work itself, moreover, appears extremely easy, so that it might be expected any one could accomplish it with the greatest facility and promptitude. But, contrary to expectation, the behaviour is quite otherwise.

I.—AN EXAMPLE OF A NORMAL REACTION TYPE.

Stimulus word.	Reaction Time. Unit 0·2 second.	Reaction.	Reproduction.

head	9	foot	part of the body
green	11	blouse	
water	14	clear	light
to sing	6	children	
dead	11	do not like	
long	6	short	I, tall
ship	7	forth	
to pay	9	bills	
window	9	room	
friendly	10	children	
table	9	chair	room
to ask	10	all kinds	
cold	7	warm	
stem	6	flower	
to dance	9	I . .	like
lake	8	Zürich	
sick	8	sister	
pride	6	people	
to cook	7	woman	
ink	5	black	
angry	10	children	people
needle	9	to prick	
to swim	10	healthy	
voyage	9	England	
blue	10	pretty	like
lamp	6	light	
to sin	8	much	people
bread	10	good	like, necessary
rich	9	nice	
tree	6	green	
to prick	9	need	

II.—AN EXAMPLE OF AN HYSTERICAL REACTION TYPE.

Stimulus word.	Reaction Time. Unit 0·2 second.	Reaction.	Reproduction.
needle	7	to sew	
to swim [128]	9	water	ship [127]
voyage	35	to ride, motion, voyager	
blue	10	colour	
lamp	7	to burn	
to sin	22	this idea is totally strange to me, I do not recognize it	
bread	10	to eat	
rich [129]	50	money, I don't know	possession
brown	6	nature	green
to prick	9	needle	
pity	12	feeling	
yellow	9	colour	
mountain	8	high	
to die	8	to perish	
salt	15	salty (laughs) I don't know	NaCl
new	15	old	as an opposite
custom	10	good	barbaric
to pray	12	Deity	
money	10	wealth	
foolish	12	narrow minded, restricted	
pamphlet	10	paper	
despise	30	that is a complicated, too foolish	
finger	8	hand, not only hand, but also foot, a joint, member, extremity	
dear	14	to pay (laughs)	

bird	8	to fly	
to fall	30	_tomber_, I will say no more, what do you mean by fall?	
book	6	to read	
unjust	8	just	
frog	11	quack	
to part	30	what does that mean?	
hunger	10	to eat	
white	12	colour, everything possible, light	
child	10	little, I did not hear well, _bébé_	
to take care	14	attention	
lead pencil	8	to draw, everything possible can be drawn	
sad	9	to weep, that is not always the case	to be
plum	16	to eat a plum, pluck what do you mean by it? Is that symbolic?	fruit
to marry	27	how can you? reunion, union union, alliance	

The following diagrams illustrate the reaction times in an association experiment in four normal test-persons. The height of each column denotes the length of the reaction time.

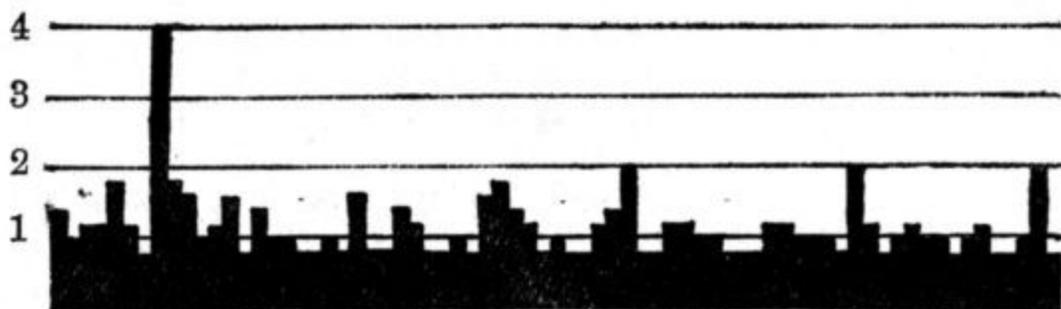


FIG. 4.

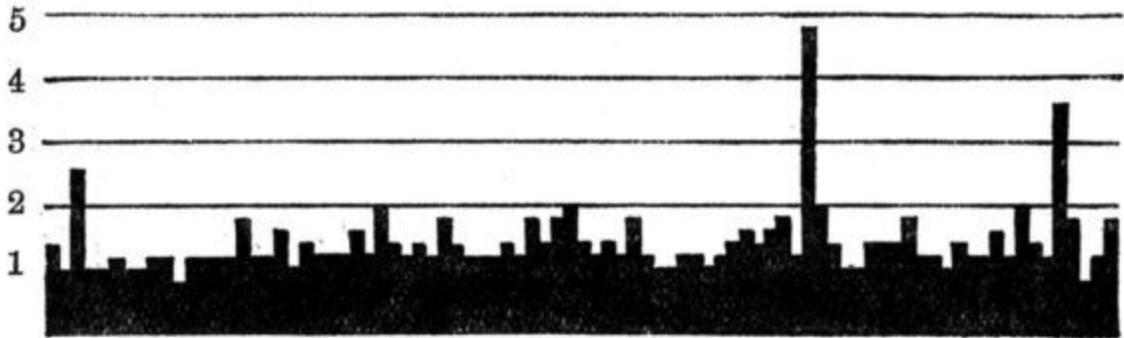


FIG. 5.

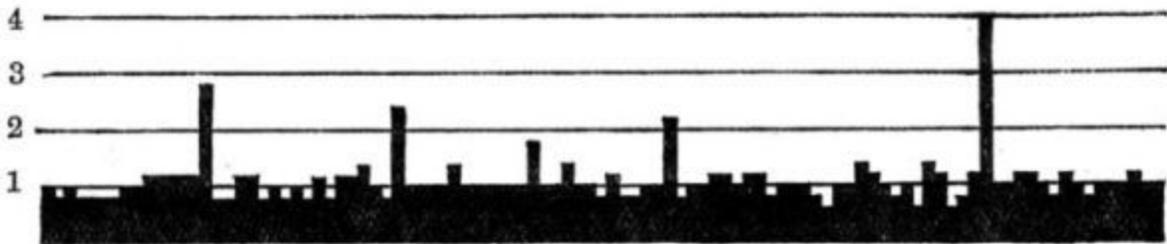


FIG. 6.

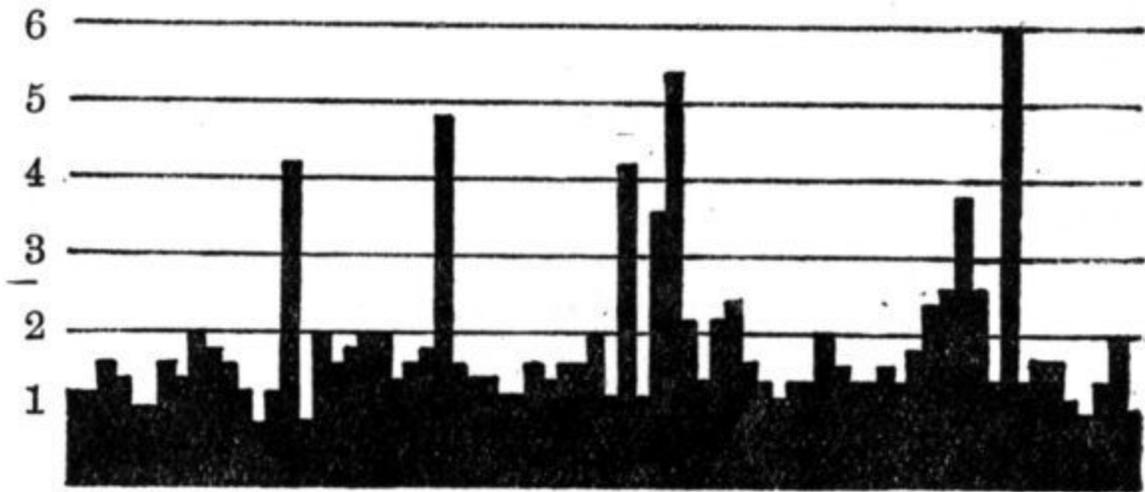


FIG. 7.

The succeeding diagram shows the course of the reaction time in hysterical individuals. The light cross-hatched columns denote the places where the test-person was unable to react (so-called failures to react).

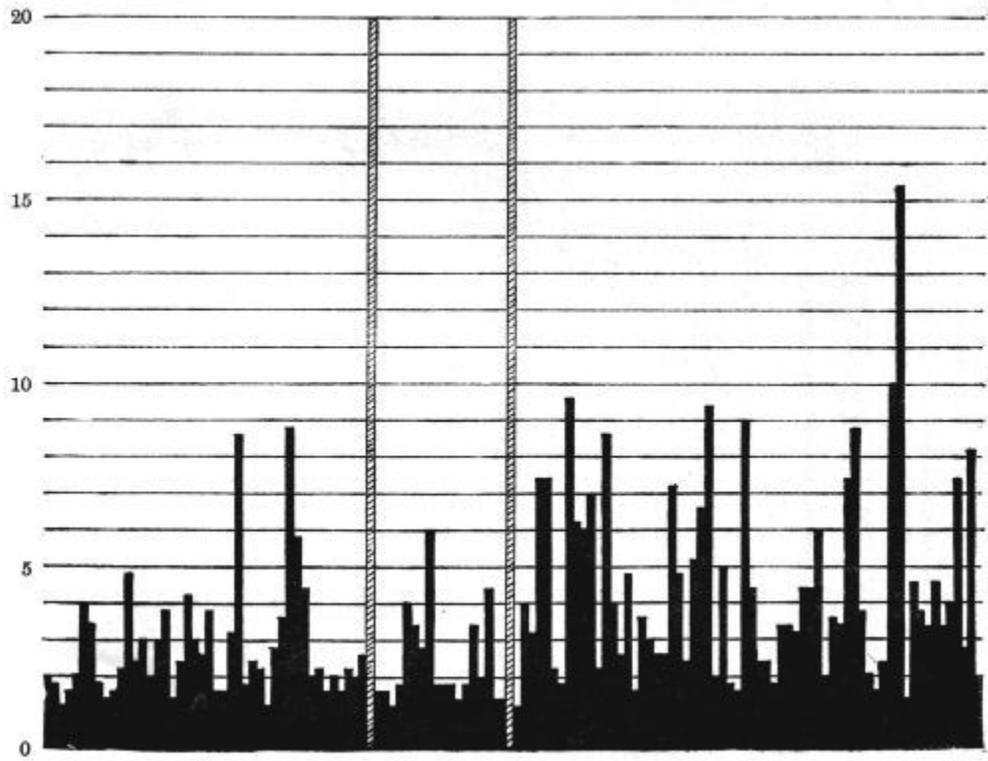


FIG. 8.

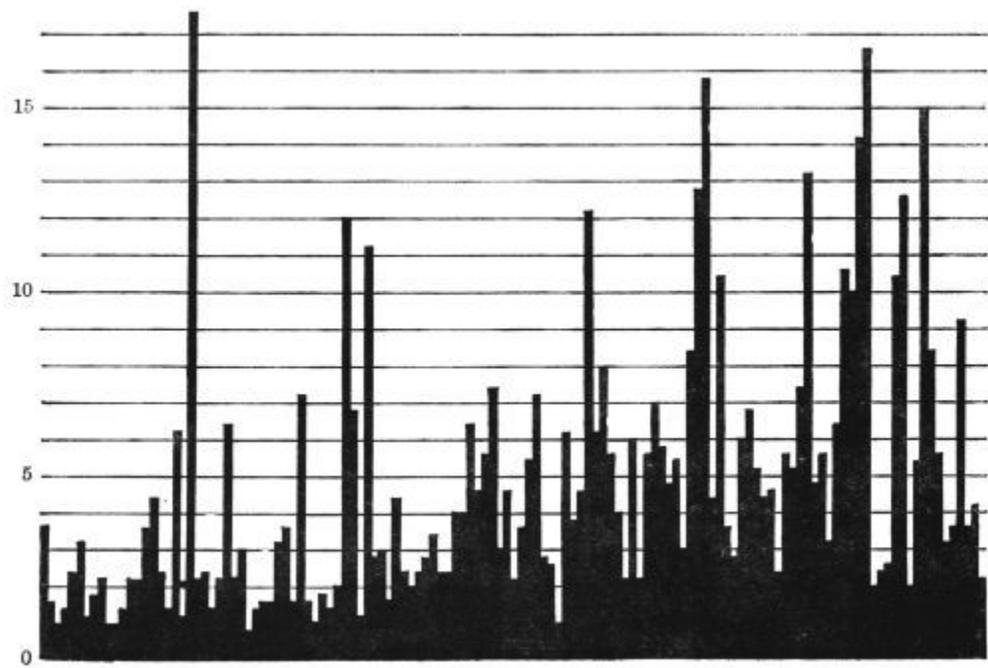


FIG. 9.

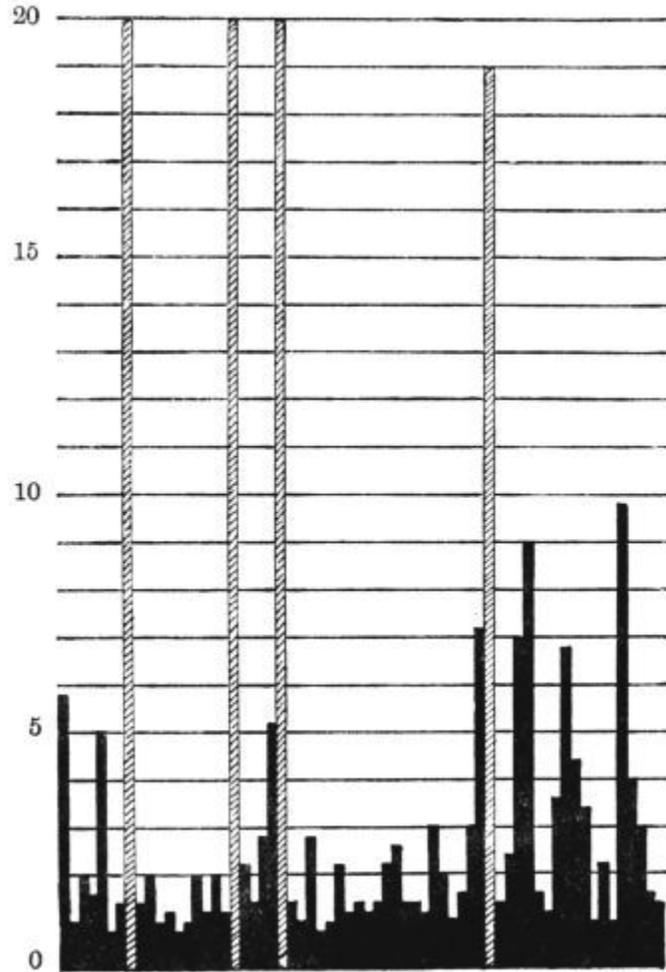


FIG. 10.

The first thing that strikes us is the fact that many test-persons show a marked prolongation of the reaction time. This would seem to be suggestive of intellectual difficulties,—wrongly however, for we are often dealing with very intelligent persons of fluent speech. The explanation lies rather in the emotions. In order to understand the matter, comprehensively, we must bear in mind that the association experiments cannot deal with a separated psychic function, for any psychic occurrence is never a thing in itself, but is always the resultant of the entire psychological past. The association experiment, too, is not merely a method for the reproduction of separated word couplets, but it is a kind of pastime, a conversation between experimenter and test-person. In a certain sense it is still more than that. Words really represent condensed actions, situations, and things. When I give a stimulus word to the test-person, which denotes an action, it is as if I represented to him the action itself, and asked him, "How do you behave

towards it? What do you think of it? What would you do in this situation?" If I were a magician, I should cause the situation corresponding to the stimulus word to appear in reality, and placing the test-person in its midst, I should then study his manner of reaction. The result of my stimulus words would thus undoubtedly approach infinitely nearer perfection. But as we are not magicians, we must be contented with the linguistic substitutes for reality; at the same time we must not forget that the stimulus word will almost without exception conjure up its corresponding situation. All depends on how the test-person reacts to this situation. The word "bride" or "bridegroom" will not evoke a simple reaction in a young lady; but the reaction will be deeply influenced by the strong feeling tones evoked, the more so if the experimenter be a man. It thus happens that the test-person is often unable to react quickly and smoothly to all stimulus words. There are certain stimulus words which denote actions, situations, or things, about which the test-person cannot think quickly and surely, and this fact is demonstrated in the association experiments. The examples which I have just given show an abundance of long reaction times and other disturbances. In this case the reaction to the stimulus word is in some way impeded, that is, the adaptation to the stimulus word is disturbed. The stimulus words therefore act upon us just as reality acts; indeed, a person who shows such great disturbances to the stimulus words, is in a certain sense but imperfectly adapted to reality. Disease itself is an imperfect adaptation; hence in this case we are dealing with something morbid in the psyche,—with something which is either temporarily or persistently pathological in character, that is, we are dealing with a psychoneurosis, with a functional disturbance of the mind. This rule, however, as we shall see later, is not without its exceptions.

Let us, in the first place, continue the discussion concerning the prolonged reaction time. It often happens that the test-person actually does *not* know what to answer to the stimulus word. He waives any reaction, and for the moment he totally fails to obey the original instructions, and shows himself incapable of adapting himself to the experimenter. If this phenomenon occurs frequently in an experiment, it signifies a high degree of disturbance in adjustment. I would call attention to the fact that it is quite indifferent what reason the test-person gives for the refusal. Some find that too many ideas suddenly occur to them; others, that they suffer from a deficiency of ideas. In most cases, however, the difficulties first perceived are so

deterrent that they actually give up the whole reaction. The following example shows a case of hysteria with many failures of reaction:—

Stimulus word.	Reaction Time. Unit 0·2 second.	Reaction.	Reproduction.
to sing	9	nice	+ ^[130]
dead	15	awful	?
long ^[131]	40	the time, the journey	?
ship ^[132]			+
to pay	11	money	
window	10	big	high
friendly	50	a man	human
to cook	10	soup	+
ink	9	black or blue	+
angry			bad
needle	9	to sew	+
lamp	14	light	+
to sin			
bread	15	to eat	+
rich ^{[133][134]}	40	good, convenient	+
yellow	18	paper	colour
mountain	10	high	+
to die	15	awful	+
salt ^[135]	25	salty	+
new			good, nice
custom ^[136]			
to pray			
money ^[137]	35	to buy, one is able	+
pamphlet	16	to write	+
to despise ^[138]	22	people	+
finger			
dear	12	thing	+
bird	12	sings or flies	+

In example II. we find a characteristic phenomenon. The test-person is not content with the requirements of the instruction, that is, she is not satisfied with *one* word, but reacts with many words. She apparently does more and better than the instruction requires, but in so doing she does not fulfil the requirements of the instruction. Thus she reacts:—custom—good—barbaric; foolish—narrow minded—restricted; family—big—small—everything possible.

These examples show in the first place that many other words connect themselves with the reaction word. The test person is unable to suppress the ideas which subsequently occur to her. She also pursues a certain tendency which perhaps is more exactly expressed in the following reaction: new—old—as an opposite. The addition of "as an opposite" denotes that the test-person has the desire to add something explanatory or supplementary. This tendency is also shown in the following reaction: finger—not only hand, also foot—a limb—member—extremity.

Here we have a whole series of supplements. It seems as if the reaction were not sufficient for the test-person, something else must always be added, as if what has already been said were incorrect or in some way imperfect. This feeling is what Janet designates the "*sentiment d'incomplétude*," but this by no means explains everything. I go somewhat deeply into this phenomenon because it is very frequently met with in neurotic individuals. It is not merely a small and unimportant subsidiary manifestation demonstrable in an insignificant experiment, but rather an elemental and universal manifestation which plays a *rôle* in other ways in the psychic life of neurotics.

By his desire to supplement, the test-person betrays a tendency to give the experimenter more than he wants, he actually makes great efforts to find further mental occurrences in order finally to discover something quite satisfactory. If we translate this observation into the psychology of everyday life, it signifies that the test-person has a constant tendency to give to others more feeling than is required and expected. According to Freud, this is a sign of a reinforced object-libido, that is, it is a compensation for an inner want of satisfaction and voidness of feeling. This elementary observation therefore displays one of the characteristics of hysterics, namely, the tendency to allow themselves to be carried away by everything, to attach themselves enthusiastically to everything, and always to promise too much

and hence perform too little. Patients with this symptom are, in my experience, always hard to deal with; at first they are enthusiastically enamoured of the physician, for a time going so far as to accept everything he says blindly; but they soon merge into an equally blind resistance against him, thus rendering any educative influence absolutely impossible.

We see therefore in this type of reaction an expression of a tendency to give more than is asked or expected. This tendency betrays itself also in other failures to follow the instruction:—

to quarrel—angry—different things—I always quarrel at home;
to marry—how can you marry?—reunion—union;
plum—to eat—to pluck—what do you mean by it?—is it symbolic?
to sin—this idea is quite strange to me, I do not recognise it.

These reactions show that the test-person gets away altogether from the situation of the experiment. For the instruction was, that he should answer only with the first word which occurs to him. But here we note that the stimulus words act with excessive strength, that they are taken as if they were direct personal questions. The test-person entirely forgets that we deal with mere words which stand in print before us, but finds a personal meaning in them; he tries to divine their intention and defend himself against them, thus altogether forgetting the original instructions.

This elementary observation discloses another common peculiarity of hysterics, namely, that of taking everything personally, of never being able to remain objective, and of allowing themselves to be carried away by momentary impressions; this again shows the characteristics of the enhanced object-libido.

Yet another sign of impeded adaptation is the often occurring *repetition of the stimulus words*. The test-persons repeat the stimulus word as if they had not heard or understood it distinctly. They repeat it just as we repeat a difficult question in order to grasp it better before answering. This same tendency is shown in the experiment. The questions are repeated because the stimulus words act on hysterical individuals in much the same way as difficult personal questions. In principle it is the same phenomenon as the subsequent completion of the reaction.

In many experiments we observe that the same reaction constantly reappears to the most varied stimulus words. These words seem to possess a special reproduction tendency, and it is very interesting to examine their relationship to the test-person. For example, I have observed a case in which the patient repeated the word "short" a great many times and often in places where it had no meaning. The test-person could not directly state the reason for the repetition of the word "short." From experience I knew that such predicates always relate either to the test-person himself or to the person nearest to him. I assumed that in this word "short" he designated himself, and that in this way he helped to express something very painful to him. The test-person is of very small stature. He is the youngest of four brothers, who, in contrast to himself, are all tall. He was always the "*child*" in the family; he was nicknamed "Short" and was treated by all as the "little one." This resulted in a total loss of self-confidence. Although he was intelligent, and despite long study, he could not decide to present himself for examination; he finally became impotent, and merged into a psychosis in which, whenever he was alone, he took delight in walking about in his room on his toes in order to appear taller. The word "short," therefore, stood to him for a great many painful experiences. This is usually the case with the perseverated words; they always contain something of importance for the individual psychology of the test-person.

The signs thus far discussed are not found spread about in an arbitrary way through the whole experiment, but are seen in very definite places, namely, where the stimulus words strike against emotionally accentuated complexes. This observation is the foundation of the so-called "diagnosis of facts" (*Tatbestandsdiagnostik*). This method is employed to discover, by means of an association experiment, which is the culprit among a number of persons suspected of a crime. That this is possible I will demonstrate by the brief recital of a concrete case.

On the 6th of February, 1908, our supervisor reported to me that a nurse complained to her of having been robbed during the forenoon of the previous day. The facts were as follows: The nurse kept her money, amounting to 70 francs, in a pocket-book which she had placed in her cupboard where she also kept her clothes. The cupboard contained two compartments, of which one belonged to the nurse who was robbed, and the other to the head nurse. These two nurses and a third one, who was an

intimate friend of the head nurse, slept in the room where the cupboard was. This room was in a section which was occupied in common by six nurses who had at all times free access to the room. Given such a state of affairs it is not to be wondered that the supervisor shrugged her shoulders when I asked her whom she most suspected.

Further investigation showed that on the day of the theft, the above-mentioned friend of the head nurse was slightly indisposed and remained the whole morning in the room in bed. Hence, unless she herself was the thief, the theft could have taken place only in the afternoon. Of four other nurses upon whom suspicion could possibly fall, there was one who attended regularly to the cleaning of the room in question, while the remaining three had nothing to do in it, nor was it shown that any of them had spent any time there on the previous day.

It was therefore natural that the last three nurses should be regarded for the time being as less implicated, so I began by subjecting the first three to the experiment.

From the information I had obtained of the case, I knew that the cupboard was locked but that the key was kept near by in a very conspicuous place, that on opening the cupboard the first thing which would strike the eye was a fur boa, and, moreover, that the pocket-book was between some linen in an inconspicuous place. The pocket-book was of dark reddish leather, and contained the following objects: a 50-franc banknote, a 20-franc piece, some centimes, a small silver watch-chain, a stencil used in the lunatic asylum to mark the kitchen utensils, and a small receipt from Dosenbach's shoeshop in Zürich.

Besides the plaintiff, only the head nurse knew the exact particulars of the deed, for as soon as the former missed her money she immediately asked the head nurse to help her find it, thus the head nurse had been able to learn the smallest details, which naturally rendered the experiment still more difficult, for she was precisely the one most suspected. The conditions for the experiment were better for the others, since they knew nothing concerning the particulars of the deed, and some not even that a theft had been committed. As critical stimulus words I selected the name of the robbed nurse, plus the following words: cupboard, door, open, key, yesterday, banknote, gold, 70, 50, 20, money, watch, pocket-book, chain,

silver, to hide, fur, dark reddish, leather, centimes, stencil, receipt, Dosenbach. Besides these words which referred directly to the deed, I took also the following, which had a special effective value: theft, to take, to steal, suspicion, blame, court, police, to lie, to fear, to discover, to arrest, innocent.

The objection is often made to the last species of words that they may produce a strong affective resentment even in innocent persons, and for that reason one cannot attribute to them any comparative value. Nevertheless, it may always be questioned whether the affective resentment of an innocent person will have the same effect on the association as that of a guilty one, and that question can only be authoritatively answered by experience. Until the contrary is demonstrated, I maintain that words of the above-mentioned type may profitably be used.

I distributed these critical words among twice as many indifferent stimulus words in such a manner that each critical word was followed by two indifferent ones. As a rule it is well to follow up the critical words by indifferent words in order that the action of the first may be clearly distinguished. But one may also follow up one critical word by another, especially if one wishes to bring into relief the action of the second. Thus I placed together "darkish red" and "leather," and "chain" and "silver."

After this preparatory work I undertook the experiment with the three above-mentioned nurses. Following the order of the experiment, I shall denote the friend of the head nurse by the letter A, the head nurse by B, and the nurse who attended to the cleaning of the room by C. As examinations of this kind can be rendered into a foreign tongue only with the greatest difficulty, I will content myself with presenting the general results, and with giving some examples. I first undertook the experiment with A, and judging by the circumstances she appeared only slightly moved. B was next examined; she showed marked excitement, her pulse being 120 per minute immediately after the experiment. The last to be examined was C. She was the most tranquil of the three; she displayed but little embarrassment, and only in the course of the experiment did it occur to her that she was suspected of stealing, a fact which manifestly disturbed her towards the end of the experiment.

The general impression from the examination spoke strongly against the head nurse B. It seemed to me that she evinced a very "suspicious," or I might almost say, "impudent" countenance. With the definite idea of finding in her the guilty one I set about adding up the results. You will see that I was wrong in my surmise and that the test proved my error.

One can make use of many special methods of computing, but they are not all equally good and equally exact. (One must always resort to calculation, as appearances are enormously deceptive.) The method which is most to be recommended is that of the probable average of the reaction time. It shows at a glance the difficulties which the person in the experiment had to overcome in the reaction.

The technique of this calculation is very simple. The probable average is the middle number of the various reaction times arranged in a series. The reaction times are, for example,^[139] placed in the following manner: 5, 5, 5, 7, 7, 7, 7, 8, 9, 9, 9, 12, 13, 14. The number found in the middle (8) is the probable average of this series.

The probable averages of the reaction are:

A	B	C
10.0	12.0	13.5.

No conclusions can be drawn from this result. But the average reaction times calculated separately for the indifferent reactions, for the critical, and for those immediately following the critical (post-critical) are more interesting.

From this example we see that whereas A has the shortest reaction time for the indifferent reactions, she shows in comparison to the other two persons of the experiment, the longest time for the critical reactions.

THE PROBABLE AVERAGE OF THE REACTION TIME.

for	A	B	C
Indifferent reactions	10·0	11·0	12·0
Critical reactions	16·0	13·0	15·0
Post-critical reactions	10·0	11·0	13·0

The difference between the reaction times, let us say between the indifferent and the critical, is 6 for A, 2 for B, and 3 for C, that is, it is more than double for A when compared with the other two persons.

In the same way we can calculate how many complex indicators there are on an average for the indifferent, critical, etc., reactions.

THE AVERAGE COMPLEX-INDICATORS FOR EACH REACTION.

for	A	B	C
Indifferent reactions	0·6	0·9	0·8
Critical reactions	1·3	0·9	1·2
Post-critical reactions	0·6	1·0	0·8

The difference between the indifferent and critical reactions for A = 0·7, for B = 0, for C = 0·4. A is again the highest.

Another question to consider is, the proportion of imperfect reactions in each case.

The result for A = 34%, for B = 28%, and for C = 30%.

Here, too, A reaches the highest value, and in this, I believe, we see the characteristic moment of the guilt-complex in A. I am, however, unable to explain here circumstantially the reasons why I maintain that memory errors are related to an emotional complex, as this would lead me beyond the limits of the present work. I therefore refer the reader to my work "*Ueber die Reproduktionsstörungen im Associationsexperiment*" (IX Beitrag der Diagnost. Associat. Studien).^[140]

As it often happens that an association of strong feeling tone produces in the experiment a perseveration, with the result that not only the critical association, but also two or three successive associations are imperfectly reproduced, it will be very interesting to see how many imperfect

reproductions are so arranged in the series in our cases. The result of computation shows that the imperfect reproductions thus arranged in series are for A 64.7%, for B 55.5%, and for C 30.0%.

Again we find that A has the greatest percentage. To be sure, this may partially depend on the fact that A also possesses the greatest number of imperfect reproductions. Given a small number of reactions, it is usual that the greater the total number of the same, the more the imperfect reactions will occur in groups. But this cannot account for the high proportion in our case, where, on the other hand, B and C have not a much smaller number of imperfect reactions when compared to A. It is significant that C with her slight emotions during the experiment shows the minimum of imperfect reproductions arranged in series.

As imperfect reproductions are also complex indicators, it is necessary to see how they distribute themselves in respect to the indifferent, critical, etc., reactions.

It is hardly necessary to bring into prominence the differences between the indifferent and the critical reactions of the various subjects as shown by the resulting numbers of the table. In this respect, too, A occupies first place.

IMPERFECT REPRODUCTIONS WHICH OCCUR.

in	A	B	C
Indifferent reactions	10	12	11
Critical reactions	19	9	12
Post-critical reactions	5	7	7

Naturally, here, too, there is a probability that the greater the number of the imperfect reproductions the greater is their number in the critical reactions. If we suppose that the imperfect reproductions are distributed regularly and without choice, among all the reactions, there will be a greater number of them for A (in comparison with B and C) even as reactions to critical words, since A has the greater number of imperfect reproductions. Admitting such a uniform distribution of the imperfect reproductions, it is easy to calculate how many we ought to expect to belong to each individual kind of reaction.

From this calculation it appears that the disturbances of reproductions which concern the critical reactions for A greatly surpass the number expected, for C they are 0·9 higher, while for B they are lower.

IMPERFECT REPRODUCTIONS.

For	Which may be expected			Which really occur		
	Indifferent Reactions.	Critical Reactions.	Post-critical Reactions.	Indifferent Reactions.	Critical Reactions.	Post-critical Reactions.
A	11·2	12·5	10·2	10	19	5
B	9·2	10·3	8·4	12	9	7
C	9·9	11·1	9·0	11	12	7

All this points to the fact that in the subject A the critical stimulus words acted with the greatest intensity, and hence the greatest suspicion falls on A. Practically relying on the test one may assume the probability of this person's guilt. The same evening A made a complete confession of the theft, and thus the success of the experiment was confirmed.

Such a result is undoubtedly of scientific interest and worthy of serious consideration. There is much in experimental psychology which is of less use than the material exemplified in this test. Putting the theoretical interest altogether aside, we have here something that is not to be despised from a practical point of view, to wit, a culprit has been brought to light in a much easier and shorter way than is customary. What has been possible once or twice ought to be possible again, and it is well worth while to investigate some means of rendering the method increasingly capable of rapid and sure results.

This application of the experiment shows that it is possible to strike a concealed, indeed an unconscious complex by means of a stimulus word; and conversely we may assume with great certainty that behind a reaction which shows a complex indicator there is a hidden complex, even though the test-person strongly denies it. One must get rid of the idea that educated and intelligent test-persons are able to see and admit their own complexes. Every human mind contains much that is unacknowledged and hence unconscious as such; and no one can boast that he stands completely above

his complexes. Those who persist in maintaining that they can, are not aware of the spectacles upon their noses.

It has long been thought that the association experiment enables one to distinguish certain *intellectual* types. That is not the case. The experiment does not give us any particular insight into the purely intellectual, but rather into the emotional processes. To be sure we can erect certain types of reaction; they are not, however, based on intellectual peculiarities, but depend entirely on the *proportionate emotional states*. Educated test-persons usually show superficial and linguistically deep-rooted associations, whereas the uneducated form more valuable associations and often of ingenious significance. This behaviour would be paradoxical from an intellectual view-point. The meaningful associations of the uneducated are not really the product of intellectual thinking, but are simply the results of a special emotional state. The whole thing is more important to the uneducated, his emotion is greater, and for that reason he pays more attention to the experiment than the educated person, and his associations are therefore more significant. Apart from those determined by education, we have to consider three principal individual types:

1. An objective type with undisturbed reactions.
2. A so-called complex-type with many disturbances in the experiment occasioned by the constellation of a complex.
3. A so-called definition-type. The peculiarity of this type consists in the fact that the reaction always gives an explanation or a definition of the content of the stimulus word; *e.g.*:

apple,—a tree-fruit;
table,—a piece of household furniture;
to promenade,—an activity;
father,—chief of the family.

This type is chiefly found in stupid persons, and it is therefore quite usual in imbecility. But it can also be found in persons who are not really stupid, but who do not wish *to be taken as stupid*. Thus a young student from whom associations were taken by an older intelligent woman student reacted

altogether with definitions. The test-person was of the opinion that it was an examination in intelligence, and therefore directed most of his attention to the significance of the stimulus words; his associations, therefore, looked like those of an idiot. All idiots, however, do not react with definitions; probably only those react in this way who would like to appear smarter than they are, that is, those to whom their stupidity is painful. I call this widespread complex the "intelligence-complex." A normal test-person reacts in a most overdrawn manner as follows:

anxiety—heart anguish;
to kiss—love's unfolding;
to kiss—perception of friendship.

This type gives a constrained and unnatural impression. The test-persons wish to be more than they are, they wish to exert more influence than they really have. Hence we see that persons with an intelligence-complex are usually unnatural and constrained; that they are always somewhat stilted, or flowery; they show a predilection for complicated foreign words, high-sounding quotations, and other intellectual ornaments. In this way they wish to influence their fellow-beings, they wish to impress others with their apparent education and intelligence, and thus to compensate for their painful feeling of stupidity. The definition-type is closely related to the predicate-type, or, to express it more precisely, to the predicate-type expressing personal judgment (*Wertprädikattypus*). For example:

flower—pretty;
money—convenient;
animal—ugly;
knife—dangerous;
death—ghastly.

In the definition type the *intellectual* significance of the stimulus word is rendered prominent, but in the predicate type its *emotional* significance. There are predicate-types which show great exaggeration where reactions such as the following appear:

piano—horrible;
to sing—heavenly;

mother—ardently loved;
father—something good, nice, holy.

In the definition-type an absolutely *intellectual* make-up is manifested or rather simulated, but here there is a very *emotional* one. Yet, just as the definition-type really conceals a lack of intelligence, so the excessive *emotional* expression conceals or overcompensates an emotional deficiency. This conclusion is very interestingly illustrated by the following discovery:—On investigating the influence of the familiar milieus on the association-type it was found that young people seldom possess a predicate-type, but that, on the other hand, the predicate-type increases in frequency with advancing age. In women the increase of the predicate-type begins a little after the 40th year, and in men after the 60th. That is the precise time when, owing to the deficiency of sexuality, there actually occurs considerable emotional loss. If a test-person evinces a distinct predicate-type, it may always be inferred that a marked internal emotional deficiency is thereby compensated. Still, one cannot reason conversely, namely, that an inner emotional deficiency must produce a predicate-type, no more than that idiocy directly produces a definition-type. A predicate-type can also betray itself through the external behaviour, as, for example, through a particular affectation, enthusiastic exclamations, an embellished behaviour, and the constrained sounding language so often observed in society.

The complex-type shows no particular tendency except the *concealment* of a complex, whereas the definition and predicate types betray a positive tendency to exert in some way a *definite* influence on the experimenter. But whereas the definition-type tends to bring to light its intelligence, the predicate-type displays its emotion. I need hardly add of what importance such determinations are for the diagnosis of character.

After finishing an association experiment I usually add another of a different kind, the so-called *reproduction* experiment. I repeat the same stimulus words and ask the test-persons whether they still remember their former reactions. In many instances the memory fails, and as experience shows, these locations are stimulus words which touched an emotionally accentuated complex, or stimulus words immediately following such critical words.

This phenomenon has been designated as paradoxical and contrary to all experience. For it is known that emotionally accentuated things are better retained in memory than indifferent things. This is quite true, but it does not hold for the *linguistic* expression of an emotionally accentuated content. On the contrary, one very easily forgets what he has said under emotion, one is even apt to contradict himself about it. Indeed, the efficacy of cross-examinations in court depends on this fact. The reproduction method therefore serves to render still more prominent the complex stimulus. In normal persons we usually find a limited number of false reproductions, seldom more than 19-20 per cent., while in abnormal persons, especially in hysterics, we often find from 20-40 per cent. of false reproductions. The reproduction certainty is therefore in certain cases a measure for the emotivity of the test-person.

By far the larger number of neurotics show a pronounced tendency to cover up their intimate affairs in impenetrable darkness, even from the doctor, so that he finds it very difficult to form a proper picture of the patient's psychology. In such cases I am greatly assisted by the association experiment. When the experiment is finished, I first look over the general course of the reaction times. I see a great many very prolonged intervals; this means that the patient can only adjust himself with difficulty, that his psychological functions proceed with marked internal frictions with *resistances*. The greater number of neurotics react only under great and very definite resistances; there are, however, others in whom the average reaction times are as short as in the normal, and in whom the other complex indicators are lacking, but, despite that fact, they undoubtedly present neurotic symptoms. These rare cases are especially found among very intelligent and educated persons, chronic patients who, after many years of practice, have learned to control their outward behaviour and therefore outwardly display very little if any trace of their neuroses. The superficial observer would take them for normal, yet in some places they show disturbances which betray the repressed complex.

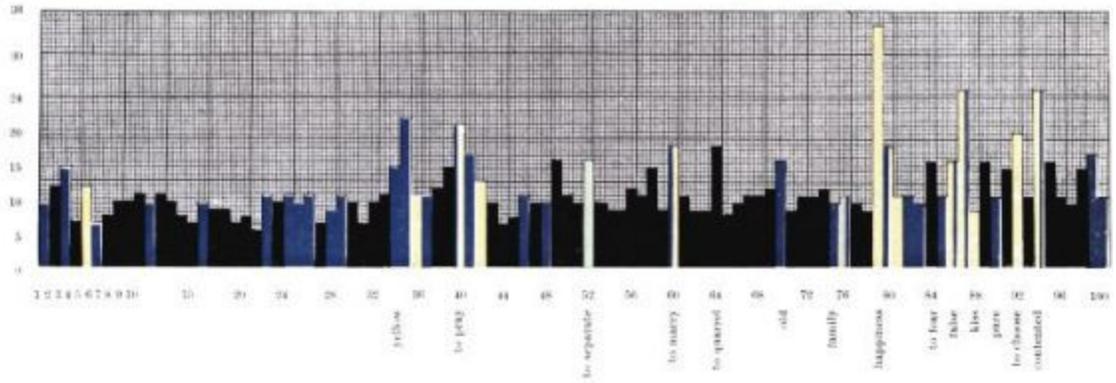
After examining the reaction times I turn my attention to the type of the association to ascertain with what type I am dealing. If it is a predicate-type I draw the conclusions which I have detailed above; if it is a complex type I try to ascertain the nature of the complex. With the necessary experience

one can readily emancipate one's judgment from the test-person's statements and almost without any previous knowledge of the test-persons it is possible under certain circumstances to read the most intimate complexes from the results of the experiment. I look at first for the reproduction words and put them together, and then I look for the stimulus words which show the greatest disturbances. In many cases merely assorting these words suffices to unearth the complex. In some cases it is necessary to put a question here and there. The matter is well illustrated by the following concrete example:

It concerns an educated woman of 30 years of age, married three years previously. Since her marriage she has suffered from episodic excitement in which she is violently jealous of her husband. The marriage is a happy one in every other respect, and it should be noted that the husband gives no cause for the jealousy. The patient is sure that she loves him and that her excited states are groundless. She cannot imagine whence these excited states originate, and feels quite perplexed over them. It is to be noted that she is a catholic and has been brought up religiously, while her husband is a protestant. This difference of religion did not admittedly play any part. A more thorough anamnesis showed the existence of an extreme prudishness. Thus, for example, no one was allowed to talk in the patient's presence about her sister's childbirth, because the sexual moment suggested therein caused her the greatest excitement. She always undressed in the adjoining room and never in her husband's presence, etc. At the age of 27 she was supposed to have had no idea how children were born. The associations gave the results shown in the accompanying chart.

The stimulus words characterised by marked disturbances are the following: yellow, to pray, to separate, to marry, to quarrel, old, family, happiness, false, fear, to kiss, bride, to choose, contented. The strongest disturbances are found in the following stimulus words: *to pray*, *to marry*, *happiness*, *false*, *fear*, and *contented*. These words, therefore, more than any others, seem to strike the complex. The conclusions that can be drawn from this is that she is not indifferent to the fact that her husband is a protestant, that she again thinks of praying, believes there is something wrong with marriage, that she is false, entertains fancies of faithlessness, is afraid (of the husband? of the future?), she is not contented with her choice (to choose) and she thinks of separation. The patient therefore has a separation

complex, for she is very discontented with her married life. When I told her this result she was affected and at first attempted to deny it, then to mince over it, but finally she admitted everything I said and added more. She reproduced a large number of fancies of faithlessness, reproaches against her husband, etc. *Her prudishness and jealousy were merely a projection of her own sexual wishes on her husband.* Because she was faithless in her fancies and did not admit it to herself she was jealous of her husband.



For the stimulus words corresponding to the numbers, see the list on pages [94](#) and [95](#).

The blue columns represent failures of reproductions, the green ones represent repetitions of stimulus words, and the yellow columns show those associations in which the patient either laughed or made mistakes, using many words instead of one. The height of the columns represent the length of the reaction time.

[To face p. 118.

It is impossible in a lecture to give a review of all the manifold uses of the association experiment. I must content myself with having demonstrated to you a few of its chief uses.

LECTURE II

THE FAMILIAL CONSTELLATIONS

Ladies and Gentlemen: As you have seen, there are manifold ways in which the association experiment may be employed in practical psychology. I

should like to speak to you to-day about another use of this experiment which is primarily of theoretical significance. My pupil, Miss Fürst, M.D., made the following researches: she applied the association experiment to 24 families, consisting altogether of 100 test-persons; the resulting material amounted to 22,200 associations. This material was elaborated in the following manner: Fifteen separate groups were formed according to logical-linguistic standards, and the associations were arranged as follows:

	Husband	Wife	Difference
I. Co-ordination	6·5	0·5	6
II. Sub and supraordination	7	—	7
III. Contrast	—	—	—
IV. Predicate expressing a personal judgment	8·5	95·0	86·5
V. Simple predicate	21·0	3·5	17·5
VI. Relations of the verb to the subject or complement	15·5	0·5	15·0
VII. Designation of time, etc.	11·0	—	11·0
VIII. Definition	11·0	—	11·0
IX. Coexistence	1·5	—	1·5
X. Identity	0·5	0·5	—
XI. Motor-speech combination	12·0	—	12·0
XII. Composition of words	—	—	—
XIII. Completion of words	—	—	—
XIV. Clang associations	—	—	—
XV. Defective reactions	—	—	—
Total	—	—	173·5
	173·5		
Average difference	—	=	11·5
	15		

As can be seen from this example, I utilise the difference to demonstrate the degree of the analogy. In order to find a basis for the sum of the resemblance I have calculated the differences among all Dr. Fürst's test-persons, not related among themselves, by comparing every female test-person with all the other unrelated females; the same has been done for the male test-persons.

The most marked difference is found in those cases where the two test-persons compared have no associative quality in common. All the groups are calculated in percentages, the greatest difference possible being $200/15 = 13.3$ per cent.

I. The average difference of male unrelated test-persons is 5.9 per cent., and that of females of the same group is 6 per cent.

II. The average difference between male related test-persons is 4.1 per cent., and that between female related tests-persons is 3.8 per cent. From these numbers we see that relatives show a tendency to agreement in the reaction type.

III. Difference between fathers and children = 4.2.
 " " mothers " " = 3.5.

The reaction types of children come nearer to the type of the mother than to the father.

IV. Difference between fathers and their sons = 3.1.
 " " " " " daughters = 4.9.
 " " mothers " " sons = 4.7.
 " " " " " daughters = 3.0.

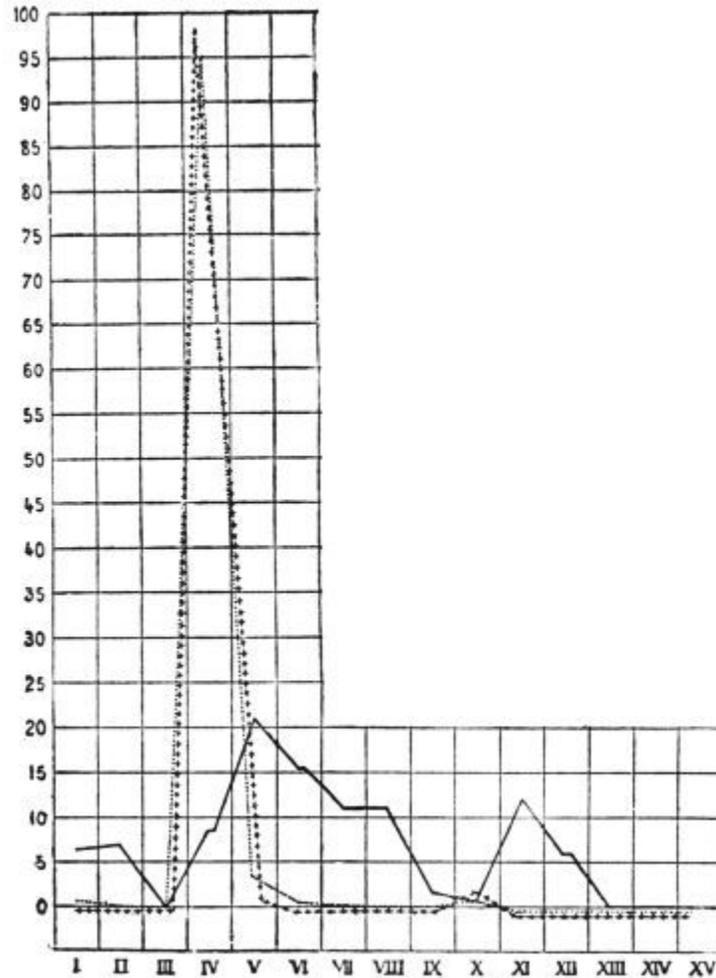


FIG. 11.

Tracing A. — father; mother; + + + + daughter.

I. Assoc. by co-ordination; II. sub and supraordination; III. contrast, etc. (see previous page).

V. Difference between brothers = 4·7.
 " " sisters = 5·1.

If the married sisters are omitted from the comparison we get the following result:

Difference of unmarried sisters = 3·8. These observations show distinctly that marriage destroys more or less the original agreement, as the husband belongs to a different type.

Difference between unmarried brothers = 4·8.

Marriage seems to exert no influence on the association forms in men. Nevertheless, the material which we have at our disposal is not as yet enough to allow us to draw definite conclusions.

VI. Difference between husband and wife = 4.7.

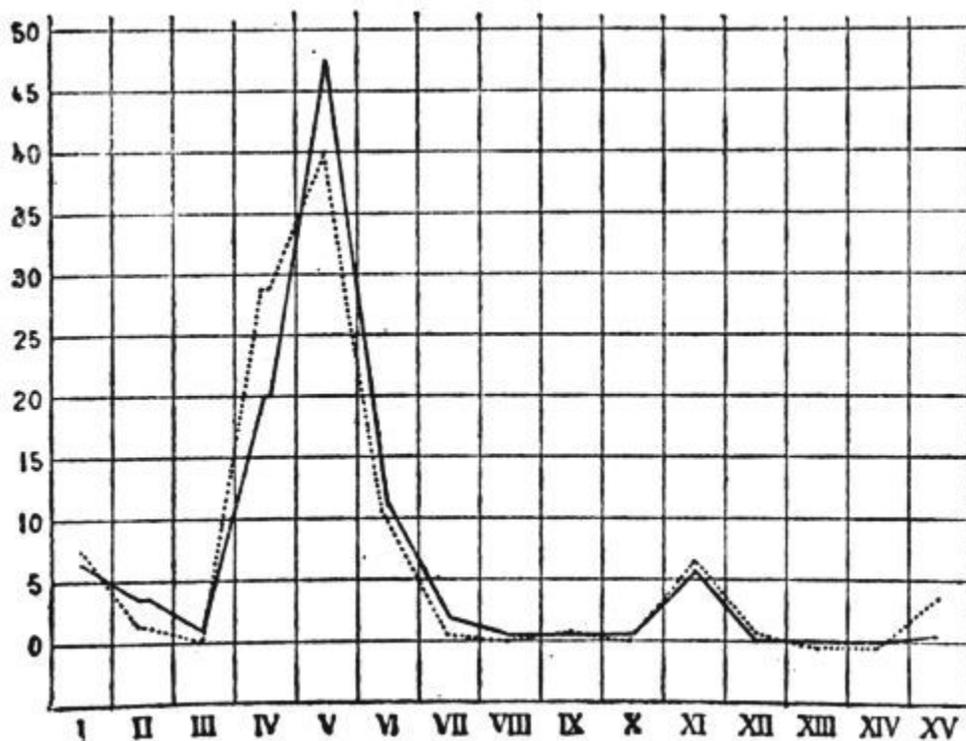


FIG. 12.

Tracing B. — husband; wife.

This number sums up inadequately the different and very unequal values; that is to say, there are some cases which show extreme difference and some which show marked concordance.

The different results are shown in the tracings (Figs. 11-15).

In the tracings I have marked the number of associations of each quality perpendicularly in percentages. The Roman letters written horizontally represent the forms of association indicated in the above tables.

Tracing A. The father (black line) shows an objective type, while the mother and daughter show the pure predicate type with a pronounced subjective tendency.

Tracing B. The husband and wife agree well in the predicate objective type, the predicate subjective being somewhat more numerous in the wife.

Tracing C. A very nice agreement between a father and his two daughters.

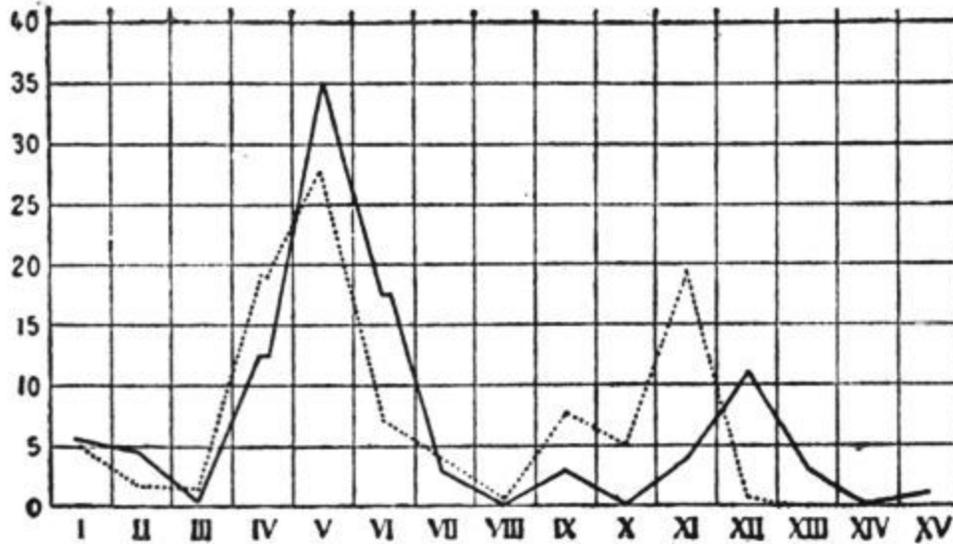


FIG. 13.

Tracing C. — father; 1st daughter; ++++ 2nd daughter.

Tracing D. Two sisters living together. The dotted line represents the married sister.

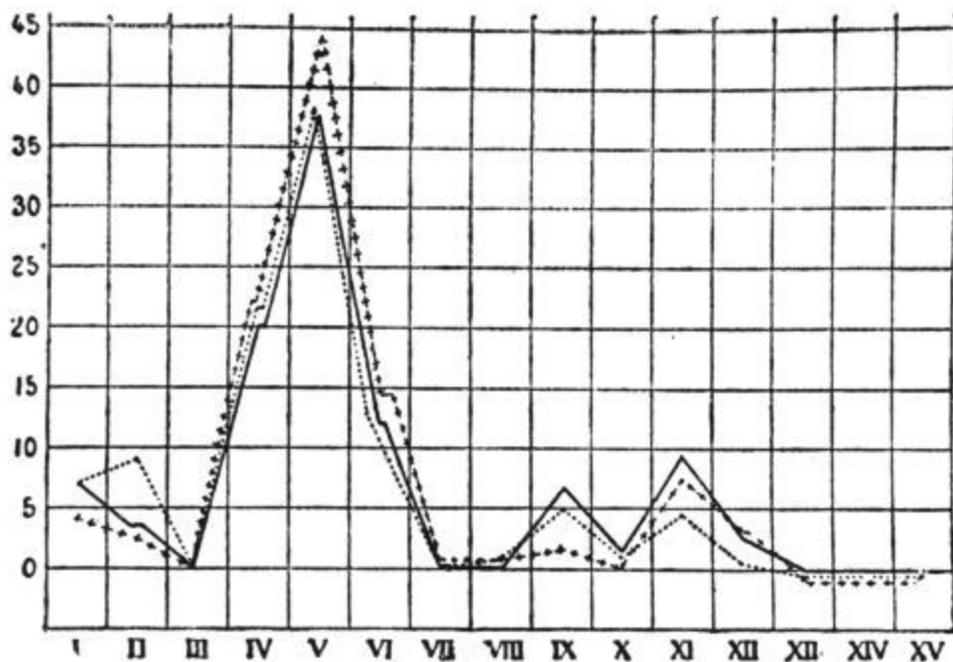


FIG. 14.

Tracing D. — single sister; married sister.

Tracing E. Husband and wife. The wife is a sister of the two women of tracing D. She approaches very closely to the type of her husband. Her tracing is the direct opposite of that of her sisters.

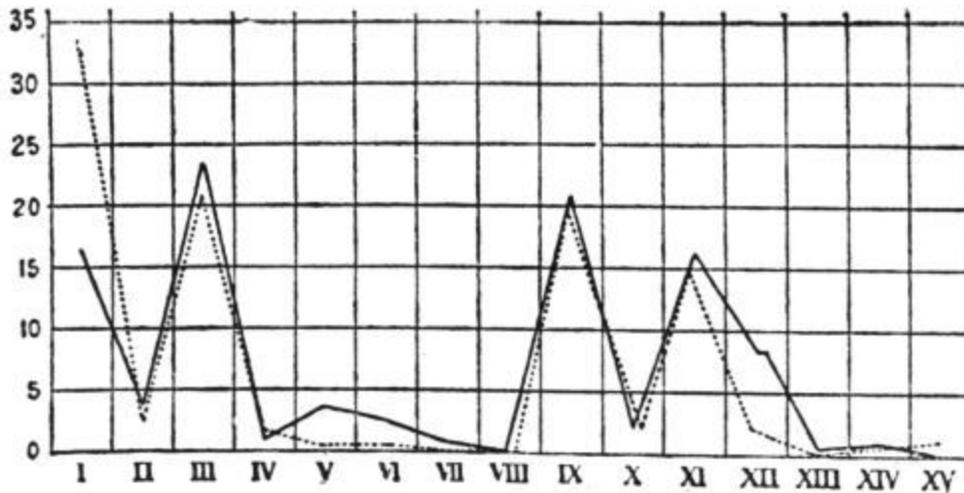


FIG. 15.

Tracing E. — husband; wife.

The similarity of the associations is often very extraordinary. I will reproduce here the associations of a mother and daughter.

Stimulus Word.	Mother.	Daughter.
to pay attention	diligent pupil	pupil
law	command of God	Moses
dear	child	father and mother
great	God	father
potato	bulbous root	bulbous root
family	many persons	5 persons
strange	traveller	traveller
brother	dear to me	dear
to kiss	mother	mother
burn	great pain	painful
door	wide	big
hay	dry	dry

month	many days	31 days
air	cool	moist
coal	sooty	black
fruit	sweet	sweet
merry	happy child	child

One might indeed think that in this experiment, where full scope is given to chance, individuality would become a factor of the utmost importance, and that therefore one might expect a very great diversity and lawlessness of associations. But as we see the opposite is the case. Thus the daughter lives contentedly in the same circle of ideas as her mother, not only in her thought but in her form of expression; indeed, she even uses the same words. What could be regarded as more inconsequent, inconstant, and lawless than a fancy, a rapidly passing thought? It is not lawless, however, neither is it free, but closely determined within the limits of the milieu. If, therefore, even the superficial and manifestly most inconsequent formations of the intellect are altogether subject to the milieu-constellation, what must we not expect for the more important conditions of the mind, for the emotions, wishes, hopes, and intentions? Let us consider a concrete example, illustrated by tracing A.

The mother is 45 years old and the daughter 16 years. Both have a very distinct predicate-type expressing personal judgment, both differ from the father in the most striking manner. The father is a drunkard and a demoralised creature. We can thus readily understand that his wife experiences an emotional voidness which she naturally betrays by her enhanced predicate-type. The same causes cannot, however, operate in the case of the daughter, for, in the first place, she is not married to a drunkard, and, in the second, life with all its hopes and promises still lies before her. It is distinctly unnatural for the daughter to show an extreme predicate-type expressing personal judgment. She responds to the stimuli of the environment just like her mother. But whereas in the mother the type is in a way a natural consequence of her unhappy condition of life, this condition is entirely lacking in the daughter. The daughter simply imitates the mother; she merely appears like the mother. Let us consider what this can signify for a young girl. If a young girl reacts to the world like an old woman, disappointed in life, this at once shows unnaturalness and constraint. But more serious consequences are possible. As you know the predicate-type is

a manifestation of intensive emotions; the emotions are always involved. Thus we cannot prevent ourselves from responding inwardly, at least, to the feelings and passions of our immediate environment; we allow ourselves to be infected and carried away by it. Originally the effects and their physical manifestations had a biological significance; *i.e.* they were a protective mechanism for the individual and the whole herd. If we manifest emotions, we can with certainty expect to receive emotions in return. That is the feeling of the predicate-type. What the 45-year-old woman lacks in emotions, *i.e.* in love in her marriage relations she seeks to obtain in the outside world, and for that reason she is an ardent participant in the Christian Science movement. If the daughter imitates this situation she copies her mother, she seeks to obtain emotions from the outside. But for a girl of sixteen such an emotional state is, to say the least, quite dangerous; like her mother, she reacts to her environment as a sufferer soliciting sympathy. Such an emotional state is no longer dangerous in the mother, but for obvious reasons it is quite dangerous in the daughter. Once freed from her father and mother she will be like her mother, *i.e.* she will be a suffering woman craving for inner gratification. She will thus be exposed to the great danger of falling a victim to brutality and of marrying a brute and inebriate like her father.

This conception is of importance in the consideration of the influence of environment and education. The example shows what passes over from the mother to the child. It is not the good and pious precepts, nor is it any other inculcation of pedagogic truths that have a moulding influence upon the character of the developing child, but what most influences him is the peculiarly affective state which is totally unknown to his parents and educators. The concealed discord between the parents, the secret worry, the repressed hidden wishes, all these produce in the individual a certain affective state with its objective signs which slowly but surely, though unconsciously, works its way into the child's mind, producing therein the same conditions and hence the same reactions to external stimuli. We know the depressing effect mournful and melancholic persons have upon us. A restless and nervous individual infects his surroundings with unrest and dissatisfaction, a grumbler with his discontent, etc. Since grown-up persons are so sensitive to surrounding influences, we should certainly expect this to be even more noticeable among children, whose minds are as soft and plastic as wax. The father and mother impress deeply into the child's mind

the seal of their personality; the more sensitive and mouldable the child the deeper is the impression. Thus things that are never even spoken about are reflected in the child. The child imitates the gesture, and just as the gesture of the parent is the expression of an emotional state, so in turn the gesture gradually produces in the child a similar feeling, as it feels itself, so to speak, into the gesture. Just as the parents adapt themselves to the world, so does the child. At the age of puberty when it begins to free itself from the spell of the family, it enters into life with, so to say, a surface adaptation entirely in keeping with that of the father and mother. The frequent and often very deep *depressions of puberty* emanate from this; they are symptoms which are rooted in the difficulty of new adjustment. The youthful person at first tries to separate himself as much as possible from his family; he may even estrange himself from it, but inwardly this only ties him the more firmly to the parental image. I cite the case of a young neurotic who ran away from his parents; he was estranged from, and almost hostile to them, but he admitted to me that he possessed a special sanctum; it was a strong box containing his old childhood books, old dried flowers, stones, and even small bottles of water from the well at his home and from a river along which he walked with his parents, etc.

The first attempts to assume friendship and love are constellated in the strongest manner possible by the relation to parents, and here one can usually observe how powerful are the influences of the familiar constellations. It is not rare, for instance, for a healthy man whose mother was hysterical to marry a hysteric, or for the daughter of an alcoholic to choose an alcoholic for her husband. I was once consulted by an intelligent and educated young woman of twenty-six who suffered from a peculiar symptom. She thought that her eyes now and then took on a strange expression which exerted a disagreeable influence on men. If she then looked at a man he became self-conscious, turned away and said something rapidly to his neighbour, at which both were either embarrassed or inclined to laugh. The patient was convinced that her look excited indecent thoughts in the men. It was impossible to convince her of the falsity of her conviction. This symptom immediately aroused in me the suspicion that I dealt with a case of paranoia rather than with a neurosis. But as was shown only three days later by the further course of the treatment, I was mistaken, for the symptom promptly disappeared after it had been explained by analysis. It originated in the following manner: The lady had a lover who

deserted her in a very marked manner. She felt utterly forsaken; she withdrew from all society and pleasure, and entertained suicidal ideas. In her seclusion there accumulated unadmitted and repressed erotic wishes which she unconsciously projected on men whenever she was in their company. This gave rise to the conviction that her look excited erotic wishes in men. Further investigation showed that her deserting lover was a lunatic, which she had not apparently observed. I expressed my surprise at her unsuitable choice, and added that she must have had a certain predilection for loving mentally abnormal persons. This she denied, stating that she had once before been engaged to be married to a normal man. He, too, deserted her; and on further investigation it was found that he, too, had been in an insane asylum shortly before,—another lunatic! This seemed to me to confirm with sufficient certainty my belief that she had an unconscious tendency to choose insane persons. Whence originated this strange taste? Her father was an eccentric character, and in later years entirely estranged from his family. Her whole love had therefore been turned away from her father to a brother eight years her senior; him she loved and honoured as a father, and this brother became hopelessly insane at the age of fourteen. That was apparently the model from which the patient could never free herself, after which she chose her lovers, and through which she had to become unhappy. Her neurosis which gave the impression of insanity, probably originated from this infantile model. We must take into consideration that we are dealing in this case with a highly educated and intelligent lady, who did not pass carelessly over her mental experiences, who indeed reflected much over her unhappiness, without, however, having any idea whence her misfortune originated.

There are things which unconsciously appear to us as a matter of course, and it is for this reason that we do not see them truly, but attribute everything to the so-called congenital character. I could cite any number of examples of this kind. Every patient furnishes contributions to this subject of the determination of destiny through the influence of the familiar milieu. In every neurotic we see how the constellation of the infantile milieu influences not only the character of the neurosis, but also life's destiny, even in its minute details. The unhappy choice of a profession, and innumerable matrimonial failures can be traced to this constellation. There are, however, cases where the profession has been well chosen, where the husband or wife leaves nothing to be desired, and where still the person does not feel well

but works and lives under constant difficulties. Such cases often appear under the guise of chronic neurasthenia. Here the difficulty is due to the fact that the mind is unconsciously split into two parts of divergent tendencies which are impeding each other; one part lives with the husband or with the profession, while the other lives unconsciously in the past with the father or mother. I have treated a lady who, after suffering many years from a severe neurosis, merged into a dementia præcox. The neurotic affection began with her marriage. This lady's husband was kind, educated, well to do, and in every respect suitable for her; his character showed nothing that would in any way interfere with a happy marriage. The marriage was nevertheless unhappy, all congenial companionship being excluded because the wife was neurotic.

The important heuristic axiom of every psychoanalysis reads as follows: *If a person develops a neurosis this neurosis contains the counter-argument against the relation of the patient to the individual with whom he is most intimately connected.* A neurosis in the husband loudly proclaims that he has intensive resistances and contrary tendencies against his wife; if the wife has a neurosis she has a tendency which diverges from her husband. If the person is unmarried the neurosis is then directed against the lover or the sweetheart or against the parents. Every neurotic naturally strives against this relentless formulation of the content of his neurosis, and he often refuses to recognise it at any cost, but still it is always justified. To be sure, the conflict is not on the surface, but must generally be revealed through a painstaking psychoanalysis.

The history of our patient reads as follows:

The father had a powerful personality. She was his favourite daughter, and entertained for him a boundless veneration. At the age of seventeen she for the first time fell in love with a young man. At that time she twice dreamt the same dream, the impression of which never left her in all her later years; she even imputed a mystic significance to it, and often recalled it with religious dread. In the dream she saw a tall, masculine figure with a very beautiful white beard; at this sight she was permeated with a feeling of awe and delight as if she experienced the presence of God Himself. This dream made the deepest impression on her, and she was constrained to think of it again and again. The love affair of that period proved to be one of little warmth, and was soon given up. Later the patient married her present

husband. Though she loved her husband she was led continually to compare him with her deceased father; this comparison always proved unfavourable to her husband. Whatever the husband said, intended, or did, was subjected to this standard and always with the same result: "My father would have done all this better and differently." Our patient's life with her husband was not happy, she could neither respect nor love him sufficiently; she was inwardly dissatisfied. She gradually developed a fervent piety, and at the same time violent hysterical symptoms supervened. She began by going into raptures now over this and now over that clergyman; she was looking everywhere for a spiritual friend, and estranged herself more and more from her husband. The mental trouble manifested itself about ten years after marriage. In her diseased state she refused to have anything to do with her husband and child; she imagined herself pregnant by another man. In brief, the resistances against her husband, which hitherto had been laboriously repressed, came out quite openly, and among other things manifested themselves in insults of the gravest kind directed against him.

In this case we see how a neurosis appeared, as it were, at the moment of marriage, *i.e. this neurosis expresses the counter-argument against the husband*. What is the counter-argument? The counter-argument is the father of the patient, for she verified her belief daily that her husband was not the equal of her father. When the patient first fell in love there had appeared a symptom in the form of an extremely impressive dream or vision. She saw the man with the very beautiful white beard. Who was this man? On directing her attention to the beautiful white beard she immediately recognised the phantom. It was of course her father. Thus every time the patient merged into a love affair the picture of her father inopportunately appeared and prevented her from adjusting herself psychologically to her husband.

I purposely chose this case as an illustration because it is simple, obvious, and quite typical of many marriages which are crippled through the neurosis of the wife. The cause of the unhappiness always lies in a too firm attachment to the parents. The infantile relationship has not been given up. We find here one of the most important tasks of pedagogy, namely, the solution of the problem how to free the growing individual from his unconscious attachments to the influences of the infantile milieu, in such a manner that he may retain whatever there is in it that is suitable and reject

whatever is unsuitable. To solve this difficult question on the part of the child seems to me impossible at present. We know as yet too little about the child's emotional processes. The first and only real contribution to the literature on this subject has in fact appeared during the present year. It is the analysis of a five-year-old boy published by Freud.

The difficulties on the part of the child are very great. They should not, however, be so great on the part of the parents. In many ways the parents could manage the love of children more carefully, more indulgently, and more intelligently. The sins committed against favourite children by the undue love of the parents could perhaps be avoided through a wider knowledge of the child's mind. For many reasons I find it impossible to say anything of general validity concerning the bringing up of children as it is affected by this problem. We are as yet very far from general prescriptions and rules; indeed we are still in the realm of casuistry. Unfortunately, our knowledge of the finer mental processes in the child is so meagre that we are not yet in any position to say where the greatest trouble lies, whether in the parents, in the child, or in the conception of the milieu. Only psychoanalyses of the kind that Professor Freud has published in the *Jahrbuch*, 1909,^[141] will help us out of this difficulty. Such comprehensive and profound observations should act as a strong inducement to all teachers to occupy themselves with Freud's psychology. This psychology offers more values for practical pedagogy than the physiological psychology of the present.

LECTURE III

EXPERIENCES CONCERNING THE PSYCHIC LIFE OF THE CHILD^[142]

Ladies and Gentlemen: In our last lecture we saw how important the emotional processes of childhood are for later life. In to-day's lecture I should like to give you some insight into the psychic life of the child through the analysis of a four-year-old girl. It is much to be regretted that there are few among you who have had the opportunity of reading the

analysis of "Little Hans" (*Kleiner Hans*), which was published by Freud during the current year.^[143] I ought to begin by giving you the content of that analysis, so that you might be in a position to compare Freud's results with those obtained by me, and observe the marked, and astonishing similarity between the unconscious creations of the two children. Without a knowledge of the fundamental analysis of Freud, much in the report of the following case will appear strange, incomprehensible, and perhaps unacceptable to you. I beg you, however, to defer your final judgment and to enter upon the consideration of these new subjects with a kindly disposition, for such pioneer work in virgin soil requires not only the greatest patience on the part of the investigator, but also the unprejudiced attention of his audience. Because the Freudian investigations apparently involve a discussion of the most intimate secrets of sexuality many people have had a feeling of repulsion against them, and have therefore rejected everything as a matter of course without any real disproof. This, unfortunately, has almost always been the fate of Freud's doctrines up to the present. One must not come to the consideration of these matters with the firm conviction that they do not exist, for it may easily happen that for the prejudiced they really do not exist. One should perhaps assume the author's point of view for the moment and investigate these phenomena under his guidance. Only in this way can the correctness or otherwise of our observations be affirmed. We may err, as all human beings err. But the continual holding up to us of our mistakes—perhaps they are worse than mistakes—does not help us to see things more distinctly. We should prefer to see *wherein* we err. That should be demonstrated to us in our own sphere of experience. Thus far, however, no one has succeeded in meeting us on our own ground, nor in giving us a different conception of the things which we ourselves see. We still have to complain that our critics persist in maintaining complete ignorance about the matters in question. The only reason for this is that they have never taken the trouble to become thoroughly acquainted with our method; had they done this they would have understood us.

The little girl to whose sagacity and intellectual vivacity we are indebted for the following observations is a healthy, lively child of emotional temperament. She has never been seriously ill, and never, even in the realm of the nervous system, had there been observed any symptoms prior to this

investigation. In the report which follows we shall have to waive any connected description, for it is made up of anecdotes which treat of one experience out of a whole cycle of similar ones, and which cannot, therefore, be arranged scientifically and systematically, but must rather be described somewhat in the form of a story. We cannot as yet dispense with this manner of description in our analytical psychology, for we are still far from being able in all cases to separate with unerring certainty what is curious from what is typical.

When the little daughter, whom we will call Anna, was about three years old, she once had the following conversation with her grandmother:

Anna: "Grandma, why are your eyes so dim?"

Grandma: "Because I am old."

A.: "But you will become young again."

G.: "No, do you know, I shall become older and older, and then I shall die."

A.: "Well, and then?"

G.: "Then I shall be an angel."

A.: "And then will you be a little baby again?"

The child found here a welcome opportunity for the provisional solution of a problem. For some time before she had been in the habit of asking her mother whether she would ever have a living doll, a little child, a little brother. This naturally included the question as to the origin of children. As such questions appeared only spontaneously and indirectly, the parents attached no significance to them, but responded to them as lightly and in appearance as carelessly as the child seemed to ask them. Thus she once received from her father the pretty story that children are brought by the stork. Anna had already heard somewhere a more serious version, namely, that children, are little angels living in heaven, and are brought from heaven by the stork. This theory seems to have become the starting point for the investigating activity of the little one. From the conversation with the

grandmother it could be seen that this theory was capable of wide application, namely, it not only solved in a comforting manner the painful idea of parting and dying, but at the same time also the riddle of the origin of children. Such solutions which kill at least two birds with one stone were formerly tenaciously adhered to in science, and cannot be removed from the mind of the child without a certain amount of shock.

Just as the birth of a little sister was the turning point in the history of "Little Hans," so in this case it was the birth of a brother, which happened when Anna had reached the age of four years. The pregnancy of the mother apparently remained unnoticed; *i.e.* the child never expressed herself on this subject. On the evening before the birth, when labour pains were beginning, the child was in her father's room. He took her on his knee and said, "Tell me, what would you say if you should get a little brother to-night?" "I would kill him" was the prompt answer. The expression "to kill" looks very serious, but in reality it is quite harmless, for "to kill" and "to die" in child language signify only to remove, either in the active or in the passive sense, as has already been pointed out a number of times by Freud. "To kill" as used by the child is a harmless word, especially so when we know that the child uses the word "kill" quite promiscuously for all possible kinds of destruction, removal, demolition, etc. It is, nevertheless, worth while to note this tendency (see the analysis of *Kleiner Hans*, p. 5).

The birth occurred early in the morning, and later the father entered the room where Anna slept. She awoke as he came in. He imparted to her the news of the advent of a little brother, which she took with surprise and strained facial expression. The father took her in his arms and carried her into the lying-in room. She first threw a rapid glance at her somewhat pale mother and then displayed something like a mixture of embarrassment and suspicion as if thinking, "Now what else is going to happen?" (Father's impression.) She displayed hardly any pleasure at the sight of the new arrival, so that the cool reception she gave it caused general disappointment. During the forenoon she kept very noticeably away from her mother; this was the more striking as she was usually much attached to her. But once when her mother was alone she ran into the room, embraced her and said, "Well, aren't you going to die now?" Now a part of the conflict in the child's psyche is revealed to us. Though the stork theory was never really taken seriously, she accepted the fruitful re-birth hypothesis, according to which a

person by dying helps a child into life. Accordingly the mother, too, must die; why, then, should the newborn child, against whom she already felt childish jealousy, cause her pleasure? It was for this reason that she had to seek a favourable opportunity of reassuring herself as to whether the mother was to die, or rather was moved to express the hope that she would not die.

With this happy issue, however, the re-birth theory sustained a severe shock. How was it possible now to explain the birth of her little brother and the origin of children in general? There still remained the stork theory which, though never expressly rejected, had been implicitly waived through the assumption of the re-birth theory. The explanations next attempted unfortunately remained hidden from the parents as the child went to stay with her grandmother for a few weeks. From the latter's report the stork theory was often discussed, and was naturally reinforced by the concurrence of those about her.

When Anna returned to her parents, she again, on meeting her mother, evinced the same mixture of embarrassment and suspicion which she had displayed after the birth. The impression, though inexplicable, was quite unmistakable to both parents. Her behaviour towards the baby was very nice. During her absence a nurse had come into the house who, on account of her uniform, made a deep impression on Anna; to be sure, the impression at first was quite unfavourable as she evinced the greatest hostility to her. Thus nothing could induce her to allow herself to be undressed and put to sleep by this nurse. Whence this resistance originated was soon shown in an angry scene near the cradle of the little brother in which Anna shouted at the nurse, "This is not your little brother, he is mine!" Gradually, however, she became reconciled to the nurse, and began to play nurse herself; she had to have her white cap and apron, and "nursed" now her little brother, and now her doll.

In contrast to her former mood she became unmistakably mournful and dreamy. She often sat for a long time under the table singing stories and making rhymes, which were partially incomprehensible but sometimes contained the "nurse" theme ("I am a nurse of the green cross"). Some of the stories, however, distinctly showed a painful feeling striving for expression.

Here we meet with a new and important feature in the little one's life: that is, we meet with reveries, even a tendency towards poetic fancies and melancholic attacks. All of them things which we are wont first to encounter at a later period of life, at a time when the youth or maiden is preparing to sever the family tie and to enter independently upon life, but is still held back by an inward, painful feeling of homesickness for the warmth of the parental hearth. At such a time the youth begins to replace what is lacking with poetic fancies in order to compensate for the deficiency. To approximate the psychology of a four-year-old child to that of the youth approaching puberty will at first sight seem paradoxical; the relationship lies, however, not in the age but rather in the mechanism. The elegiac reveries express the fact that a part of that love which formerly belonged, and should belong, to a real object, is now *introverted*, that is, it is turned inward into the subject and there produces an increased imaginative activity. What is the origin of this *introversion*? Is it a psychological manifestation peculiar to this age, or does it owe its origin to a conflict?

This is explained in the following occurrence. It often happened that Anna was disobedient to her mother, she was insolent, saying, "I am going back to grandma."

Mother: "But I shall be sad when you leave me."

Anna: "Oh, but you have my little brother."

This reaction towards the mother shows what the little one was really aiming at with her threats to go away again; she apparently wished to hear what her mother would say to her proposal, that is, to see what attitude her mother would actually assume to her, whether her little brother had not ousted her altogether from her mother's regard. One must, however, give no credence to this little trickster. For the child could readily see and feel that, despite the existence of the little brother, there was nothing essentially lacking to her in her mother's love. The reproach to which she subjects her mother is therefore unjustified, and to the trained ear this is betrayed by a slightly affected tone. Such an unmistakable tone does not expect to be taken seriously and hence it obtrudes itself more vehemently. The reproach as such cannot be taken seriously by the mother, for it was only the forerunner of other and this time more serious resistances. Not long after the conversation narrated above, the following scene took place:

Mother: "Come, we are going into the garden now!"

Anna: "You are telling lies, take care if you are not telling the truth."

M.: "What are you thinking of? I *am* telling the truth."

A.: "No, you are not telling the truth."

M.: "You will soon see that I am telling the truth: we are going into the garden now."

A.: "Indeed, is that true? Is that really true? Are you not lying?"

Scenes of this kind were repeated a number of times. This time the tone was more rude and more vehement, and at the same time the accent on the word "lie" betrayed something special which the parents did not understand; indeed, at first they attributed too little significance to the spontaneous utterances of the child. In this they merely did what education usually does in general, *ex officio*. We usually pay little heed to children in every stage of life; in all essential matters, they are treated as not responsible, and in all unessential matters, they are trained with an automatic precision.

Under resistances there always lies a question, a conflict, of which we hear later and on other occasions. But usually one forgets to connect the thing heard with the resistances. Thus, on another occasion, Anna put to her mother the following questions:—

Anna: "I should like to become a nurse when I grow big—why did you not become a nurse?"

Mother: "Why, as I have become a mother I have children to nurse anyway."

A. (Reflecting): "Indeed, shall I be a lady like you, and shall I talk to you then?"

The mother's answer again shows whither the child's question was really directed. Apparently Anna, too, would like to have a child to "nurse" just as the nurse has. Where the nurse got the little child is quite clear. Anna, too, could get a child in the same way if she were big. Why did not the mother become such a nurse, that is to say, how did she get a child if not in the

same way as the nurse? Like the nurse, Anna, too, could get a child, but how that fact might be changed in the future or how she might come to resemble her mother in the matter of getting children is not clear to her. From this resulted the thoughtful question, "Indeed, shall I be a lady like you? Shall I be quite different?" The stork theory evidently had come to naught, the dying theory met a similar fate; hence she now thinks one may get a child in the same way, as, for example, the nurse got hers. She, too, could get one in this natural way, but how about the mother who is no nurse and still has children? Looking at the matter from this point of view, Anna asks: "Why did you not become a nurse?" namely, "why have you not got your child in the natural way?" This peculiar indirect manner of questioning is typical, and evidently corresponds with the child's hazy grasp of the problem, unless we assume a certain diplomatic uncertainty prompted by a desire to evade direct questioning. We shall later find an illustration of this possibility. Anna is evidently confronted with the question "Where does the child come from?" The stork did not bring it; mother did not die; nor did mother get it in the same way as the nurse. She has, however, asked this question before and received the information from her father that the stork brings children; this is positively untrue, she can never be deceived on this point. Accordingly, papa and mama and all the others lie. This readily explains her suspicion at the childbirth and her discrediting of her mother. But it also explains another point, namely, the elegiac reveries which we have attributed to a partial introversion. We know now what was the real object from which love was removed and uselessly introverted, namely, it had to be taken *from the parents* who deceived her and refused to tell her the truth. (What can this be which must not be uttered? What is going on here?) Such were the parenthetic questions of the child, and the answer was: Evidently this must be something to be concealed, perhaps something dangerous. Attempts to make her talk and to draw out the truth by means of artful questions were futile, so *resistance is placed against resistance*, and the introversion of love begins. It is evident that the capacity for sublimation in a four-year-old child is still too slightly developed to be capable of performing more than symptomatic services. The mind, therefore, depends on another compensation, namely, it resorts to one of the relinquished infantile devices for securing love by force, preferably that of crying and calling the mother at night. This had been diligently practised and exhausted during her first year. It now returns, and corresponding to the

period of life has become well determined and equipped with recent impressions. It was just after the earthquakes in Messina, and this event was discussed at the table. Anna was extremely interested in everything, she repeatedly asked her grandmother to tell her how the earth shook, how the houses fell in and many people lost their lives. After this she had nocturnal fears, she could not be alone, her mother had to go to her and stay with her; otherwise she feared that an earthquake would happen, that the house would fall and kill her. During the day, too, she was much occupied with such thoughts. While walking with her mother she annoyed her with such questions as, "Will the house be standing when we return home? Are you sure there is no earthquake at home? Will papa still be living?" About every stone lying in the road she asked whether it was from an earthquake. A building in course of erection was a house destroyed by the earthquake, etc. Finally, she began to cry out frequently at night that the earthquake was coming and that she heard the thunder. Each evening she had to be solemnly assured that there was no earthquake coming.

Many means of calming her were tried, thus she was told, for example, that earthquakes only occur where there are volcanoes. But then she had to be satisfied that the mountains surrounding the city were not volcanoes. This reasoning led the child by degrees to a desire for learning, as strong as it was unnatural at her age, which showed itself in a demand that all the geological atlases and text-books should be brought to her from her father's library. For hours she rummaged through these works looking for pictures of volcanoes and earthquakes, and asking questions continually. Here we are confronted by an energetic effort to sublimate the fear into an eager desire for knowledge, which at this age made a decidedly premature exaction. But how many a gifted child suffering in exactly the same way with such problems, is "cosseted" through this untimely sublimation, by no means to its advantage. For, by favouring sublimation at this age one is merely strengthening manifestation of neurosis. The root of the eager desire for knowledge is *fear*, and *fear is the expression of converted libido*; that is, it is the expression of *an introversion which has become neurotic*, which at this age is neither necessary nor favourable for the development of the child.

Whither this eager desire for knowledge was ultimately directed is explained by a series of questions which arose almost daily. "Why is Sophie

(a younger sister) younger than I?" "Where was Freddie (the little brother) before? Was he in heaven? What was he doing there? Why did he come down just now, why not before?"

This state of affairs led the father to decide that the mother should tell the child when occasion offered *the truth concerning the origin of the little brother*. This having been done, Anna soon thereafter asked about the stork. Her mother told her that the story of the stork was not true, but that Freddie grew inside his mother like the flowers in a plant. At first he was very little, and then he became bigger and bigger as a plant does. She listened attentively without the slightest surprise, and then asked, "But did he come out all by himself?"

Mother: "Yes."

Anna: "But he cannot walk!"

Sophie: "Then he crawled out."

Anna, overhearing her little sister's answer: "Is there a hole here? (pointing to the breast) or did he come out of the mouth? Who came out of the nurse?" She then interrupted herself and exclaimed, "No, no, the stork brought baby brother down from heaven." She soon left the subject and again wished to see pictures of volcanoes. During the evening following this conversation she was calm. The sudden explanation produced in the child a whole series of ideas, which manifested themselves in certain questions. New unexpected perspectives were opened; she rapidly approached the main problem, namely, the question, "*Where did the baby come out?*" *Was it from a hole in the breast or from the mouth?* Both suppositions are entirely qualified to form acceptable theories. We even meet with recently married women who still entertain the theory of the hole in the abdominal wall or of the Cæsarean section; this is supposed to betray a very unusual degree of innocence. But as a matter of fact it is not innocence; we are always dealing in such cases with infantile sexual activities, which in later life have brought the *vias naturales* into ill repute.

It may be asked where the child got the absurd idea that there is a hole in the breast, or that the birth takes place through the mouth. Why did she not select one of the natural openings existing in the pelvis from which things

come out daily? The explanation is simple. Very shortly before, our little one had invoked some educational criticism from her mother by a heightened interest in both openings with their remarkable excretions,—an interest not always in accord with the requirements of cleanliness and decorum. Then for the first time she became acquainted with the exceptional laws relating to these bodily regions and, being a sensitive child, she soon learned that there was something here to be tabooed. This region, therefore, must not be referred to. Anna had simply shown herself docile and had so adjusted herself to the cultural demands that she thought (at least spoke) of the simplest things last. The incorrect theories substituted for correct laws sometimes persist for years until brusque explanations come from without. It is, therefore, no wonder that such theories, the forming of and adherence to which are favoured even by parents and educationalists should later become determinants for important symptoms in a neurosis, or of delusions in a psychosis, just as I have shown that in dementia præcox^[144] what has existed in the mind for years always remains somewhere, though it may be hidden under compensations of a seemingly different kind.

But even before this question was settled as to where the child really comes out a new problem obtruded itself, viz. the children came out of the mother, but how is it with the nurse? Did some one come out of her too? This question was followed by the remark, "No, no, the stork brought down baby brother from heaven." What is there peculiar about the fact that nobody came out of the nurse? We recall that Anna identified herself with the nurse, and planned to become a nurse later, for she, too, would like to have a child, and she could have one as well as the nurse. But now when it is known that the little brother grew in mama, how is it now?

This disquieting question is averted by a quick return to the stork-angel theory which has never been really believed and which after a few trials is at last definitely abandoned. Two questions, however, remain in the air. The first reads as follows: Where does the child come out? The second, a considerably more difficult one, reads: How does it happen that mama has children while the nurse and the servants do not? All these questions did not at first manifest themselves.

On the day following the explanation, while at dinner, Anna spontaneously remarked: "My brother is in Italy, and has a house of cloth and glass, but it does not tumble down."

In this case, as in the others, it was impossible to ask for an explanation; the resistances were too great and Anna could not be drawn into conversation. This former officious and pretty explanation is very significant. For some three months the two sisters had been building a stereotyped fanciful conception of a "big brother." This brother knows everything, he can do and has everything, he has been and is in every place where the children are not; he is owner of great cows, oxen, horses, dogs; everything is his, etc. Every one has such a "big brother." We must not look far for the origin of this fancy; the model for it is the *father* who seems to correspond to this conception; he seems to be like a brother to mama. The children, too, have their similar powerful "brother." This brother is very brave; he is at present in dangerous Italy and inhabits an impossible fragile house, and *it does not tumble down*. For the child this realises an important wish: *the earthquake is no longer to be dangerous*; in consequence *the child's fear disappeared and did not return*. The fear of earthquakes now entirely vanished. Instead

of calling her father to her bed to conjure away the fear, she now became very affectionate and begged him every night to kiss her.

In order to test this new state of affairs the father showed her pictures illustrating volcanoes and earthquake devastations. Anna remained unaffected, she examined the pictures with indifference, remarking, "These people are dead; I have already seen that quite often." The picture of a volcanic eruption no longer had any attraction for her. Thus all her scientific interest collapsed and vanished as suddenly as it came. During the days following the explanation Anna had quite important matters to occupy herself with; she disseminated her newly acquired knowledge among those about her in the following manner: She began by again circumstantially affirming what had been told her, viz. that Freddy, her younger sister, and herself had grown in her mother, that papa and mama grew in their mothers, and that the servants likewise grew in their respective mothers. By frequent questions she tested the true basis of her knowledge, for her suspicion was aroused in no small measure, so that it needed many confirmations to remove all her uncertainties.

On one occasion the trustworthiness of the theory threatened to go to pieces. About a week after the explanation, the father was taken ill with influenza and had to remain in bed during the forenoon. The children knew nothing about this, and Anna, coming into the parents' bedroom, saw what was quite unusual, namely, that her father was remaining in bed. She again took on a peculiar surprised expression; she remained at a distance from the bed and would not come nearer; she was apparently again reserved and suspicious. But suddenly she burst out with the question, "Why are you in bed; have you a plant in your inside too?"

The father naturally had to laugh. He calmed her, however, by assuring her that children never grow in the father, that only women can have children, and not men; thereupon the child again became friendly. But though the surface was calm the problems continued to work in the dark. A few days later, while at dinner, Anna related the following dream: "I dreamed last night of Noah's ark." The father then asked her what she had dreamed about it, but Anna's answer was sheer nonsense. In such cases it is necessary only to wait and pay attention. A few minutes later she said to her mother, "I dreamed last night about Noah's ark, and there were a lot of little animals in it." Another pause. She then began her story for the third time. "*I dreamed*

last night about Noah's ark, and there were a lot of baby animals in it, and underneath there was a lid and that opened and all the baby animals fell out."

The children really had a Noah's ark, but its opening, a lid, was on the roof and not underneath. In this way she delicately intimated that the story of the birth from mouth or breast is incorrect, and that she had some inkling where the children came out.

A few weeks then passed without any noteworthy occurrences. On one occasion she related the following dream: *"I dreamed about papa and mama; they had been sitting late in the study, and we children were there too."* On the face of this we find a wish of the children to be allowed to sit up as long as the parents. This wish is here realised, or rather it is utilised to express a more important wish, namely, *to be present in the evening when the parents are alone*; of course, quite innocently, it was in the *study* where she has seen all the interesting books, and where she has satiated her thirst for knowledge; *i.e.* she was really seeking an answer to the burning question, whence the little brother came. If the children were there they would find out.^[145] A few days later Anna had a terrifying dream from which she awoke crying, "The earthquake is coming, the house has begun to shake." Her mother went to her and calmed her by saying that the earthquake was not coming, that everything was quiet, and that everybody was asleep. Whereupon Anna said: *"I would like to see the spring, when all the little flowers are coming out and the whole lawn is full of flowers; I would like to see Freddy, he has such a dear little face. What is papa doing? What is he saying?"* The mother said, "He is asleep, and isn't saying anything now." Little Anna then remarked with a sarcastic smile: *"He will surely be sick again to-morrow."*

This text should be read backwards. The last sentence was not meant seriously, as it was uttered in a mocking tone. When the father was sick the last time, Anna suspected that he had a "plant in his inside." The sarcasm signifies: "To-morrow papa is surely going to have a child." But this also is not meant seriously. Papa is not going to have a child; mama alone has children; perhaps she will have another child to-morrow; but where from? "What does papa do?" The formulation of the difficult problem seems here to come to the surface. It reads: What does papa really do if he does not

bear children? The little one is very anxious to have a solution for all these problems; she would like to know how Freddy came into the world, she would like to see how the little flowers come out of the earth in the spring, and these wishes are hidden behind the fear of earthquakes.

After this intermezzo Anna slept quietly until morning. In the morning her mother asked her what she had dreamed. She did not at first recall anything, and then said: "*I dreamed that I could make the summer, and then some one threw a Punch*^[146] *down into the closet.*"

This peculiar dream apparently has two different scenes which are separated by "then." The second part draws its material from the recent wish to possess a Punch, that is, to have a boy doll just as mama has a little boy. Some one threw Punch down into the closet; one often lets other things fall down into the water closet. *It is just like this that the children, too, come out.* We have here an analogy to the "Lumpf-theory" of little Hans.^[147] Whenever several scenes are found in one dream, each scene ordinarily represents a particular variation of the complex elaboration. Here accordingly the first part is only a variation of the theme found in the second part. The meaning of "to see the spring" or "to see the little flowers come out" we have already remarked. Anna now dreams that she *can make the summer*, that is she can bring it about that the little flowers shall come out. She herself can make a little child, and the second part of the dream represents this just as one makes a motion in the w.c. Here we find the egoistic wish which is behind the seemingly objective interest of the previous night's conversation.

A few days later the mother was visited by a lady who expected soon to become a mother. The children seemed to take no interest in the matter, but the next day they amused themselves with the following play which was directed by the elder girl; they took all the newspapers they could find in their father's paper-basket and stuffed them under their clothes, so that the imitation was unmistakable. During the night little Anna had another dream: "*I dreamed about a woman in the city; she had a very big stomach.*" The chief actor in a dream is always the dreamer himself under some definite aspect; thus the childish play of the day before is fully solved.

Not long after, Anna surprised her mother with the following performance: She stuck her doll under her clothes, then pulled it out slowly head

downwards, and at the same time remarked, "*Look, the baby is coming out, now it is all out.*" By this means Anna tells her mother, "You see, thus I apprehend the problem of birth. What do you think of it? Is that right?" The play is really meant to be a question, for, as we shall see later, this idea had to be officially confirmed. That rumination on this problem by no means ended here, is shown by the occasional ideas conceived during the following weeks. Thus she repeated the same play a few days later with her Teddy Bear, who stands in the relation of an especially beloved doll. One day, looking at a rose, she said to her grandmother, "See, the rose is getting a baby." As her grandmother did not quite understand her, she pointed to the enlarged calyx and said, "Don't you see it is quite fat here?"

Anna once quarrelled with her younger sister, and the latter exclaimed angrily, "I will kill you." Whereupon Anna answered, "When I am dead you will be all alone; then you will have to pray to God for a live baby." But the scene soon changed: Anna was the angel, and the younger sister was forced to kneel before her and pray to her that she should present to her a living child. In this way Anna became the child-dispensing mother.

Oranges were once served at table. Anna impatiently asked for one and said, "*I am going to take an orange and swallow it all down into my stomach, and then I shall get a baby.*" Who does not think here of fairy tales in which childless women become pregnant by swallowing fruit, fish, and similar things?^[148] In this way Anna sought to solve the problem *how the children actually come into the mother*. She thus enters into a formulation which hitherto had not been defined with so much clearness. The solution follows in the form of an *analogy*, which is quite characteristic of the archaic thinking of the child. (In the adult, too, there is a kind of thinking by metaphor which belongs to the stratum lying immediately below consciousness; dreams bring the analogies to the surface; the same may be observed also in dementia præcox.) In German as well as in numerous foreign fairy tales one frequently finds such characteristic childish comparisons. Fairy tales seem to be the myths of the child, and therefore contain among other things the mythology which the child weaves concerning the sexual processes. The spell of the fairy tale poetry, which is felt even by the adult, is explained by the fact that some of the old theories are still alive in our unconscious minds. We experience a strange, peculiar and familiar feeling when a conception of our remotest youth is again

stimulated. Without becoming conscious it merely sends into consciousness a feeble copy of its original emotional strength.

The problem how the child gets into the mother was difficult to solve. As the only way of taking things into the body is through the mouth, it could evidently be assumed that the mother ate something like a fruit, which then grows inside her. But then comes another difficulty, namely, it is clear enough what the mother produces, but it is not yet clear what the father is good for.

What does the father do? Anna now occupied herself exclusively with this question. One morning she ran into the parents' bedroom while they were dressing, she jumped into her father's bed, lay face downwards, kicked with her legs and called at the same time, "*Look! does papa do that?*" The analogy to the horse of "little Hans" which raised such disturbance with its legs, is very surprising.

With this last performance the problem seemed to be at rest entirely, at least the parents found no opportunity to make any pertinent observations. That the problem should come to a standstill just here is not at all surprising, for this is really its most difficult part. Moreover, we know from experience that not many children go beyond these limits during the period of childhood. The problem is almost too difficult for the childish mind, which still lacks much knowledge necessary to its solution.

This standstill lasted about five months, during which no phobias or other signs of complex-elaboration appeared. After this lapse of time there appeared premonitory signs of some new incidents. Anna's family lived at that time in the country near a lake where the mother and children could bathe. As Anna was afraid to wade farther into the water than knee-deep, her father once put her into the water, which led to an outburst of crying. In the evening while going to bed Anna asked her mother, "Do you not believe that father wanted to drown me?" A few days later there was another outburst of crying. She continued to stand in the gardener's way until he finally placed her in a newly dug hole. Anna cried bitterly, and afterwards maintained that the gardener wished to bury her. Finally she awoke during the night with fearful crying. Her mother went to her in the adjoining room and quieted her. She had dreamed that "a train passed and then fell in a heap."

This tallies with the "stage coach" of "little Hans." These incidents showed clearly enough that fear was again in the air, *i.e.* that a resistance had again arisen preventing transference to the parents, and that therefore a great part of her love was converted into fear. This time suspicion was not directed against the mother, but against the father, who she was sure must know the secret, but would never let anything out. What could the father be doing or keeping secret? To the child this secret appeared as something dangerous, so that she felt the worst might be expected from the father. (This feeling of childish anxiety with the father as object we see again most distinctly in adults, especially in dementia præcox, which lifts the veil of obscurity from many unconscious processes, as though it were following psychoanalytic principles.) It was for this reason that Anna came to the apparently absurd conclusion that her father wanted to drown her. At the same time her fear contained the thought that the *object of the father had some relation to a dangerous action*. This stream of thought is no arbitrary interpretation. Anna meanwhile grew a little older and her interest in her father took on a special colouring which is hard to describe. Language has no words to describe the quite unique kind of tender curiosity which shone in the child's eyes.

Anna once took marked delight in assisting the gardener while he was sowing grass, without apparently divulging the profound significance of her play. About a fortnight later she began to observe with great pleasure the young grass sprouting. On one of these occasions she asked her mother the following question: "Tell me, how did the eyes grow into the head?" The mother told her that she did not know. Anna, however, continued to ask whether God or her papa could tell this? The mother then referred her to her father, who might tell her how the eyes grew into the head. A few days later there was a family reunion at tea. When the guests had departed, the father remained at the table reading the paper and Anna also remained. Suddenly approaching her father she said, "Tell me, how did the eyes grow into the head?"

Father: "They did not grow into the head; they were there from the beginning and grew with the head."

A.: "Were not the eyes planted?"

F.: "No, they grew in the head like the nose."

A.: "Did the mouth and the ears grow in the same way? and the hair, too?"

F.: "Yes, they all grew in the same way."

A.: "And the hair, too? But the mousies came into the world naked. Where was the hair before? Aren't there little seeds for it?"

F.: "No; you see, the hair really came out of little grains which are like seeds, but these were already in the skin long before and nobody sowed them." The father was now getting concerned; he knew whither the little one's thoughts were directed, but he did not wish to overthrow, for the sake of a former false application, the opportunely established seed-theory which she had most fortunately gathered from nature; but the child spoke with an unwonted seriousness which demanded consideration.

Anna (evidently disappointed, and in a distressed tone): "But how did Freddy get into mama? Who stuck him in? and who stuck you into your mama? Where did he come out from?"

From this sudden storm of questions the father chose the last for his first answer. "Just think, you know well enough that Freddy is a boy; boys become men and girls women. Only women and not men can have children; now just think, where could Freddy come out from?"

A. (Laughs joyfully and points to her genitals): "Did he come out here?"

Father: "Yes, of course, you certainly must have thought of this before?"

A. (Overlooking the question): "But how did Freddy get into mama? Did anybody plant him? Was the seed planted?"

This very precise question could no longer be evaded by the father. He explained to the child, who listened with the greatest attention, that the mother is like the soil and the father like the gardener; that the father provides the seed which grows in the mother, and thus gives origin to a baby. This answer gave extraordinary satisfaction; she immediately ran to her mother and said, "Papa has told me everything, now I know it all." She did not, however, tell what she knew.

The new knowledge was, however, put into play the following day. Anna went to her mother and said, "Think, mama, papa told me how Freddy was a little angel and was brought from heaven by a stork." The mother was

naturally surprised and said, "No, you are mistaken, papa surely never told you such a thing!" whereupon the little one laughed and ran away.

This was apparently a mode of revenge. Her mother did not wish or was not able to tell her how the eyes grew into the head, hence she did not know how Freddy got into her. It was for this reason that she again tried her with the old story.

I wish to impress firmly upon parents and educationists this instructive example of child psychology. In the learned psychological discussions on the child's psyche we hear nothing about those parts which are so important for the health and naturalness of our children, nor do we hear more about the child's emotions and conflicts; and yet they play a most important rôle.

It very often happens that children are erroneously treated as quite imprudent and irrational beings. Thus on indulgently remarking to an intelligent father, whose four-year-old daughter masturbated excessively, that care should be exercised in the presence of the child who slept in the same room as the parents, I received the indignant reply, "I can absolutely assure you that the child knows nothing about sexual matters." This recalls that distinguished old neurologist who wished to deny the attribute "sexual" to a childbirth phantasy which was represented in a dreamy state.

On the other hand, a child evincing neurotic talent exaggerated by neurosis may be urged on by solicitous parents. How easy and tempting it would have been, *e.g.* in the present case, to admire, excite, and develop prematurely the child's eager desire for learning, and thereby develop an unnatural *blasé* state and a precociousness masking a neurosis! In such cases the parents must look after their own complexes and complex tendencies and not make capital out of them at the expense of the child. The idea should be dismissed once for all that children are to be held in bondage by their parents or that they are their toys. They are characteristic and new beings. In the matter of enlightenment on sexual things it can be affirmed that they suffer from the preconceived opinion that the truth is harmful. Many neurologists are of opinion that even in grown-ups enlightenment on their own psychosexual processes is harmful and even immoral. Would not the same persons perhaps refuse to admit the existence of the genitals themselves?

One should not, however, go from this extreme of prudishness to the opposite one, namely that of enlightenment *à tout prix*, which may turn out as foolish as it is disagreeable. In this matter I believe much discretion is advisable; still if children come upon an idea, they should be deceived no more than adults.

I hope, ladies and gentlemen, that I have shown you what complicated psychic processes psychoanalytic investigation reveals in the child, and how great is the significance of these processes for the mental health as well as for the general psychic development of the child. What I have been unable to show is the universal validity of these observations. Unfortunately, I am not in a position to demonstrate this, for I do not know myself how much of it is universally valid. Only by accumulation of such observations and further penetration into the problems broached shall we gain a complete insight into the laws of psychical development. It is to be regretted that we are at present still far from this goal. But I confidently hope that educators and practical psychologists, whether physicians or deep-thinking parents, will not leave us too long unassisted in this immensely important and interesting field.

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CHAPTER III

THE SIGNIFICANCE OF THE FATHER IN THE DESTINY OF THE INDIVIDUAL^[149]

Ducunt volentem fata, nolentem trahunt.

Freud has pointed out in many places^[150] with unmistakable clearness that the psychosexual relationship of the child towards his parents, particularly towards the father, possesses an overwhelming importance in the content of any later neurosis. This relationship is in fact the infantile channel *par excellence* in which the libido flows back^[151] when it encounters any obstacles in later years, thus revivifying long-forgotten dreams of childhood. It is ever so in life when we draw back before too great an obstacle—the menace of some severe disappointment or the risk of some too far-reaching decision—the energy stored up for the solution of the task flows back impotent; the by-streams once relinquished as inadequate are again filled up. He who has missed the happiness of woman's love falls back, as a substitute, upon some gushing friendship, upon masturbation, upon religiosity; should he be a neurotic he plunges still further back into the conditions of childhood which have never been quite forsaken, to which even the normal is fettered by more than one link—he returns to the relationship to father and mother. Every psychoanalysis carried out at all thoroughly shows this regression more or less plainly. One peculiarity which stands out in the works and views of Freud is that the relationship to the father is seen to possess an overwhelming importance. This importance of the father in the moulding of the child's psycho-sexuality may also be discovered in a quite other and remote field, in the investigation of the family.^[152] The most recent thorough investigations demonstrate the predominating influence of the father often lasting for centuries. The mother seems of less importance in the family.^[153] If this is true for heredity on the physical side how much more should we expect from the psychological influences emanating from the father? These experiences, and those gained more particularly in an analysis carried out conjointly with

Dr. Otto Gross, have impressed upon me the soundness of this view. The problem has been considerably advanced and deepened by the investigations of my pupil, Dr. Emma Fürst, into familial resemblances in the reaction-type.^[154] Fürst made association experiments on one hundred persons belonging to twenty-four families. Of this extensive material, only the results in nine families and thirty-seven persons (all uneducated) have been worked out and published. But the painstaking calculations do already permit some valuable conclusions. The associations are classified on the KRÆPELIN-ASCHAFFENBURG scheme as simplified and modified by myself; the difference is then calculated between each group of qualities of the subjects experimented upon and the corresponding group of every other subject experimented upon. Thus we finally get the differentiation of the mean in reaction-type. The following is the result:—

Non-related men differ among themselves by 5·9.

Non-related women differ among themselves by 6·0.

Related men differ among themselves by 4·1.

Related women differ among themselves by 3·8.

Relatives, and especially related women, have therefore, on the average, resemblance in reaction-type. This fact means that the psychological adaptation of relatives differs but slightly.

An investigation into the various relationships gave the following:—

The mean difference of the husband and wife amounts to 4·7. The mean deviation of this mean is, however, 3·7, a very high figure, which signifies that the mean figure 4·7 is composed of very heterogeneous figures; there are married couples in whom the reaction type is very close and others in whom it is very slight. On the whole, however, father and son, mother and daughter stand remarkably close.

The difference between father and son amounts to 3·1.

The difference between mother and daughter amounts to 3·0.

With the exception of a few cases of married couples (where the difference fell to 1·4) these are the lowest differences. In Fürst's work there was a case where the difference between the forty-five year old mother and her sixteen year old daughter was only 0·5. But it was just in this case that the mother

and daughter differed from the father's type by 11·8. The father is a coarse, stupid man, an alcoholic; the mother goes in for Christian Science. This corresponds with the fact that mother and daughter exhibit an extreme word-predicate type,^[155] which is, in my experience, important semeiotically for the diagnosis of insufficiency in the sexual object. The word-predicate type transparently applies an excessive amount of emotion externally and displays emotions with the unconscious, but nevertheless obvious, endeavour to awaken echoing emotions in the experimenter. This view closely corresponds with the fact that in Fürst's material the number of word-predicates increases with the age of the subjects experimented upon.

The fact of the extreme similarity between the reaction-type of the offspring and the parents is matter for thought. The association experiment is nothing but a small section from the psychological life of a man. At bottom daily life is nothing but an extensive and many-varied association experiment; in essence we react in life just as we do in the experiments. Although this truth is evident, still it requires a certain consideration and limitation. Let us take as an instance the case of the unhappy mother of forty-five years and her unmarried daughter of sixteen. The extreme word-predicate type of the mother is, without doubt, the precipitate of a whole life of disappointed hopes and wishes. One is not in the least surprised at the word-predicate type here. But the daughter of sixteen has really not yet lived at all; her real sexual object has not yet been found, and yet she reacts as if she were her mother with endless disillusion behind her. She has *the mother's adaptation*, and in so far she is identified with the mother. There is ample evidence that the mother's adaptation must be attributed to her relationship to the father. But the daughter is not married to the father and therefore does not need this adaptation. She has taken it over from the influence of her milieu, and later on will try to adapt herself to the world with this *familial disharmony*. In so far as an ill-assorted marriage is unsuitable, the adaptation resulting from it is unsuitable.

Clearly such a fate has many possibilities. To adapt herself to life, this girl either will have to surmount the obstacles of her familial milieu, or, unable to free herself from them, she *will succumb to the fate to which such an adaptation predisposes* her. Deep within, unnoticed by any one, there may go on a glossing over of the infantile disharmony, or a development of the negative of the parents' character, accompanied by hindrances and conflicts

to which she herself has no clue. Or, growing up, she will come into painful conflict with that world of actualities to which she is so ill-adapted till one stroke of fate after another gradually opens her eyes to the fact that it is herself, infantile and maladjusted, that is amiss. The source of infantile adaptation to the parents is naturally the affective condition on both sides; the psycho-sexuality of the parents on one side and that of the child on the other. It is a kind of psychical infection; we know that it is not logical truth, but affects and their psychical expressions^[156] which are here the effective forces. It is these that, with the power of the herd-instinct, press into the mind of the child, there fashioning and moulding it. In the plastic years between one and five there have to be worked out all the essential formative lines which fit exactly into the parental mould. Psychoanalytic experience teaches us that, as a rule, the first signs of the later conflict between the parental constellation and individual independence, of the struggle between repression and libido (Freud), occur before the fifth year.

The few following histories will show how this parental constellation obstructs the adaptation of the offspring. It must suffice to present only the chief events of these, that is the events of sexuality.

Case 1.—A well-preserved woman of 55; dressed poorly but carefully in black with a certain elegance, the hair carefully dressed; a polite, obviously affected manner, precise in speech, a devotee. The patient might be the wife of a minor official or shopkeeper. She informs me, blushing and dropping her eyes, that she is the divorced wife of a common peasant. She has come to the hospital on account of depression, night terrors, palpitations, slight nervous twitchings in the arms, thus presenting the typical features of a slight climacteric neurosis. To complete the picture, she adds that she suffers from severe anxiety-dreams; in her dreams some man seems to be pursuing her, wild animals attack her, and so on.

Her anamnesis begins with the family history. (So far as possible I give her own words.) Her father was a fine, stately, rather corpulent man of imposing appearance. He was very happy in his marriage, for her mother *worshipped* him. He was a clever man, a master-mechanic, and held a dignified and honourable position. There were only two children, the patient and an elder sister. The sister was the mother's, and the patient her father's favourite. When the patient was five years old the father died

suddenly from a stroke, at the age of forty-two. The patient felt herself very isolated and was from that time treated by the mother and the elder sister as the Cinderella. She noticed clearly enough that her mother preferred her sister to herself. Her mother remained a widow, her respect for her husband being too great to allow her to marry a second time. She preserved his memory "like a religious cult" and brought up her children in this way.

Later on the sister married, relatively young; the patient did not marry till twenty-four. She never cared for young men, they all seemed insipid; her mind turned always to more mature men. When about twenty she became acquainted with a stately gentleman rather over forty, to whom she was much drawn. For various reasons the friendship was broken off. At twenty-four she became acquainted with a widower who had two children. He was a fine, stately, somewhat corpulent man, and had an imposing presence, like her father; he was forty-four. She married him and respected him enormously. The marriage was childless; the children by the first marriage died from an infectious disease. After four years of married life her husband also died. For eighteen years she remained his faithful widow. But at forty-six (just before the menopause) she experienced a great need of love. As she had no acquaintances she went to a matrimonial agency and married the first comer, a peasant of some sixty years who had been already twice divorced on account of brutality and perverseness; the patient knew this before marriage. She remained five unbearable years with him, when she also obtained a divorce. The neurosis set in a little later.

No further discussion will be required for those with psychoanalytic experience; the case is too obvious. For those unversed in psychoanalysis let me point out that up to her forty-sixth year the patient did but reproduce most faithfully the milieu of her earliest youth. The sexuality which announced itself so late and so drastically, even here only led to a deteriorated edition of the father-surrogate; to this she is brought by this late-blossoming sexuality. Despite repression, the neurosis betrays the ever-fluctuating eroticism of the aging woman who still wants to please (affectation) but dares not acknowledge her sexuality.

Case 2.—A man of thirty-four of small build and with a sensible, kindly expression. He is easily embarrassed, blushes often. He came for treatment on account of "nervousness." He says he is very irritable, readily fatigued,

has nervous indigestion, is often deeply depressed so that he has thought of suicide.

Before coming to me for treatment he sent me a circumstantial autobiography, or rather a history of his illness, in order to prepare me for his visit. His story began: "My father was a very big and strong man." This sentence awakened my curiosity; I turned over a page and there read: "When I was fifteen a big lad of nineteen took me into the wood and indecently assaulted me."

The numerous gaps in the patient's story induced me to obtain a more exact anamnesis from him, which produced the following remarkable facts.

The patient is the youngest of three brothers. His father, a big, red-haired man, was formerly a soldier in the Papal Swiss Guard, and then became a policeman. He was a strict, gruff old soldier, who brought up his sons with military precision; he commanded them, did not call them by name, but whistled to them. He had spent his youth in Rome, where he acquired syphilis, from the consequences of which he still suffered in old age. He was fond of talking about his adventures in early life. His eldest son (considerably older than the patient) was exactly like him, he was big, strong and had reddish hair. The mother was a feeble woman, prematurely aged; exhausted and tired of life, she died at forty when the patient was eight years old. He preserved a tender and beautiful memory of his mother.

When he went to school he was always the whipping-boy and always the object of his schoolfellows' mockery. The patient considers that his peculiar dialect was to blame for this. Later he was apprenticed to a severe and unkind master, under most trying conditions, from which all the other apprentices had run away, finding them intolerable. Here he held out for over two years. At fifteen the assault already mentioned took place, in addition to some other slighter homosexual experiences. Then fate sent him to France. There he made the acquaintance of a man from the South of France, a great boaster and Don Juan. He dragged the patient into a brothel; he went unwilling and out of fear. He was impotent there. Later he went to Paris, where his brother, a master-mason, the replica of his father, was leading a dissolute life. There the patient remained a long time, badly paid and helping his sister-in-law out of pity. The brother often took him along to a brothel, where the patient was always impotent. Here the brother asked

him to make over to him his inheritance, 6000 francs. He first consulted his second brother, who was also in Paris, who urgently tried to dissuade him from giving the money to his brother, because it would only be squandered. Nevertheless the patient gave his all to his brother, who indeed soon squandered it. And the second brother, who would have dissuaded him, was also let in for 500 francs. To my astonished question why he had so lightly given the money to his brother without any guarantee, he replied: he had asked for it, he was not a bit sorry about the money; he would give him another 6000 francs if he had it. The eldest brother came to grief altogether and his wife divorced him. The patient returned to Switzerland and remained for a year without regular employment, often suffering from hunger. During this time he made the acquaintance of a family where he became a frequent visitor. The husband belonged to some peculiar sect; he was a hypocrite and neglected his family. The wife was elderly, ill and weak, and moreover pregnant. There were six children and great poverty. The patient developed warm affection for this woman and divided with her the little he possessed. She brought him her troubles, and said she felt sure she would die in childbed. Then he promised her (he who possessed nothing) to take charge of the children himself and bring them up. The wife did die in childbed. The orphanage-board interfered, however, and allowed him only one child. So he had a child but no family, and naturally could not bring it up by himself. He thus came to think of marrying. But as he had never been in love with any woman he was in great perplexity. It then occurred to him that his elder brother was divorced from his wife, and he resolved to marry her. He wrote his intention to her in Paris. She was seventeen years older than he, but not disinclined to the plan. She invited him to come to Paris to talk matters over. On the eve of this journey fate, however, willed that he should run a big iron nail into his foot so that he could not travel. After a little while, when the wound was healed, he went to Paris, and found that he had imagined his sister-in-law, and now his *fiancée*, to be younger and prettier than she really was. The wedding took place, and three months later the first coitus, at his wife's initiative. He himself had no desire for it. They brought up the child together, he in the Swiss and she in the French way, for she was a French woman. At the age of nine the child was run over and killed by a cyclist. The patient then felt very lonely and dismal at home. He proposed to his wife that she should adopt a young girl, whereupon she broke out into a fury of jealousy. Then

for the first time he fell in love with a young girl, whilst at the same time the neurosis started, with deep depression and nervous exhaustion, for meanwhile his life at home had become a hell.

My proposition to separate from his wife was refused out of hand, because he could not take upon himself to make the old woman unhappy on his account. He clearly prefers to be tormented still further; for it would seem that the recollection of his youth is more precious to him than any present joys.

In this case also the whole movement of a life takes place in the magic circle of the familial constellation. The relation to the father is the strongest and most momentous issue; its masochistic homosexual colouring stands out clearly everywhere. Even the unhappy marriage is determined in every way through the father, for the patient marries the divorced wife of his eldest brother, which *is as if* he married his mother. His wife is also the representative of the mother-surrogate, of the friend who died in childbed.

The neurosis started at the moment when the libido had obviously withdrawn from this relationship of infantile constellation, and approached, for the first time, the sexual end determined by the individual. In this, as in the previous case, the familial constellation proves to be by far the stronger; the narrow field vouchsafed by a neurosis is all that remains for the display of individuality.

Case 3.—A thirty-six year old peasant woman, of average intelligence, healthy appearance and robust build, mother of three healthy children. Comfortable family circumstances. Patient comes to the hospital for treatment for the following reasons: for some weeks she has been terribly wretched and anxious, has been sleeping badly, has terrifying dreams, and suffers also during the day from anxiety and depression. All these things are admittedly without foundation, she herself is surprised at them, and must admit her husband is perfectly right when he insists they are all "stuff and nonsense." All the same she cannot get away from them. Strange ideas come to her too; she is going to die and is going to hell. She gets on very well with her husband.

The psychoanalytic examination of the case immediately brought the following: some weeks before, she happened to take up some religious

tracts which had long lain about the house unread. There she read that *swearers* would go to hell. She took this very much to heart, and has since thought it incumbent on her to prevent people swearing or she herself will go to hell. About a fortnight before she read these tracts, her father, who lived with her, suddenly died from a stroke. She was not actually present at his death, but arrived when he was already dead. Her terror and grief were very great.

In the days following the death she thought much about it all, wondering why her father had to meet his end so abruptly. In the midst of such meditations it suddenly occurred to her that the last words she had heard her father say were: "I also am one of those who have fallen from the cart into the devil's clutches." The remembrance filled her with grief, and she recalled how often her father had sworn savagely. She wondered then whether there really were a life after death, and whether her father were in heaven or hell. During these musings she came across the tracts and began to read them, getting to the place where it said that swearers go to hell. Then came upon her great fear and terror; she overwhelmed herself with reproaches, she ought to have stopped her father's swearing, deserved punishment for her neglect. She would die and would be condemned to hell. Henceforth she was full of sorrow, moody, tormented her husband with this obsessive idea, and renounced all joy and happiness.

The patient's life-history (reproduced partly in her own words) is as follows:

She is the youngest of five brothers and sisters and was always her *father's favourite*. The father gave her everything she wanted if he possibly could. For instance, if she wanted a new dress and her mother refused it, she could be sure her father would bring her one next time he went to town. The mother died rather early. At twenty-four the patient married the man of her choice, *against her father's wishes*. The father simply disapproved of her choice although he had nothing particular against the man. After the wedding she made her father come and live with them. That seemed a matter of course, she said, since the other relations had never suggested having him with them. The father was a quarrelsome swearer and drunkard. Husband and father-in-law, as may easily be imagined, got on extremely badly together. The patient would always meekly fetch her father spirits from the inn, although this gave rise perpetually to anger and altercations.

But she finds her husband "all right." He is a good, patient fellow with only one failing: he does not obey her father enough; she finds that incomprehensible, and would rather have her husband knuckle under to her father. All said and done, father is still father. In the frequent quarrels she always took her father's part. But she has nothing to say against her husband and he is usually right in his protests, but *one must help one's father*.

Soon it began to seem to her that she had sinned against her father by marrying against his will, and she often felt, after one of these incessant wrangles, that her love for her husband had quite vanished. And since her father's death it is impossible to love her husband any longer, for his disobedience was the most frequent occasion of her father's fits of raging and swearing. At one time the quarrelling became too painful for the husband, and he induced his wife to find rooms for her father elsewhere, where he lived for two years. During this time husband and wife lived together peaceably and happily. But by degrees the patient began to reproach herself for letting her father live alone; in spite of everything he was her father. And in the end, despite the husband's protests, she fetched him home again because, as she said, in truth she did love her father better than her husband. Scarcely was the old man back in the house before strife was renewed. And so it went on till the father's sudden death.

After this recital she broke out into a whole series of lamentations: she must separate from her husband: she would have done it long ago if it were not for the children. She had indeed done an ill-deed, committed a very great sin when she married her husband against her father's wish. She ought to have taken the man whom her father had wanted her to have. He certainly would have obeyed her father and then everything would have been right. Oh, her husband was not by a long way so kind as her father, she could do anything with her father, but not with her husband. Her father had given her everything she wanted. *Now she would best of all like to die, so that she might be with her father*.

When this outburst was over, I inquired eagerly on what grounds she had refused the husband her father had suggested to her.

The father, a small peasant on a lean little farm, had taken as a servant, just at the time when his youngest daughter came into the world, a miserable little boy, a foundling. The boy developed in most unpleasant fashion: he

was so stupid that he could not learn to read or write or even speak quite properly. He was an absolute idiot. As he approached manhood there developed on his neck a series of ulcers, some of which opened and continually discharged pus, giving such a dirty, ugly creature a horrible appearance. His intelligence did not grow with his years, so he stayed on as servant in the peasant's house without any recognised wage.

To this youth the father wanted to marry his favourite daughter.

The girl, fortunately, had not been disposed to yield, but now she regretted it, since this idiot would unquestionably have been more obedient to her father than her good man had been.

Here, as in the foregoing case, it must be clearly understood that the patient is not at all weak-minded. Both possess normal intelligence, which unfortunately the blinkers of the infantile constellation prevent their using. That appears with quite remarkable clearness in this patient's life-story. The father's authority is never questioned! It makes not the least difference that he is a quarrelsome drunkard, the obvious cause of all the quarrels and disturbances; on the contrary, the lawful husband must give way to the bogey, and at last our patient even comes to regret that her father did not succeed in completely destroying her life's happiness. So now she sets about doing that herself through her neurosis, which compels in her the wish to die, that she may go to hell, whither, be it noted, the father has already betaken himself.

If we are ever disposed to see some demonic power at work controlling mortal destiny, surely we can see it here in these melancholy silent tragedies working themselves out slowly, torturingly, in the sick souls of our neurotics. Some, step by step, continually struggling against the unseen powers, do free themselves from the clutches of the demon who forces his unsuspecting victims from one savage mischance to another: others rise up and win to freedom, only to be dragged back later to the old paths, caught in the noose of the neurosis. You cannot even maintain that these unhappy people are neurotic or "degenerates." If we normal people examine our lives from the psychoanalytic standpoint, we too perceive how a mighty hand guides us insensibly to our destiny and not always is this hand a kindly one.

[157] We often call it the hand of God or of the Devil, for the power of the

infantile constellation has become mighty during the course of the centuries in affording support and proof to all the religions.

But all this does not go so far as to say that we must cast the blame of inherited sins upon our parents. A sensitive child whose intuition is only too quick in reflecting in his own soul all the excesses of his parents must lay the blame for his fate on his own characteristics. But, as our last case shows, this is not always so, for the parents can (and unfortunately only too often do) fortify the evil in the child's soul, preying upon the child's ignorance to make him the slave of their complexes. In our case this attempt on the part of the father is quite obvious. It is perfectly clear why he wanted to marry his daughter to this brutish creature: *he wanted to keep her and make her his slave for ever*. What he did is but a crass exaggeration of what is done by thousands of so-called respectable, educated people, who have their own share in this educational dust-heap of enforced discipline. The fathers who allow their children no independent possession of their own emotions, who fondle their daughters with ill-concealed eroticism and tyrannical passion, who keep their sons in leading-strings, force them into callings and finally marry them off "suitably," and the mothers who even in the cradle excite their children with unhealthy tenderness, later on make them into slavish puppets, and then at last, out of jealousy, destroy their children's love-life fundamentally, they all act not otherwise than this stupid and brutal boor.

It will be asked, wherein lies the parents' magic power to bind their children to themselves, as with iron fetters, often for the whole of their lives? The psychoanalyst knows that it is nothing but the sexuality on both sides.

We are always trying not to admit the child's sexuality. That view only comes from wilful ignorance, which happens to be very prevalent again just now.^[158]

I have not given any real analysis of these cases. We therefore do not know what happened within the hearts of these puppets of fate when they were children. A profound insight into a child's mind as it grows and lives, hitherto unattainable, is given in Freud's contribution to the first half-yearly volume of *Jahrbuch für Psychoanalytische u. Psychopathologische Forschungen*. If I venture, after Freud's masterly presentation, to offer

another small contribution to the study of the child-mind it is because the psychoanalytic records of cases seem to me always valuable.

Case 4.—An eight year old boy, intelligent, rather delicate-looking, is brought to me by his mother, on account of enuresis. During the consultation the child always hangs on to his mother, a pretty, youthful woman. The parents' marriage is a happy one, but the father is strict, and the boy (the eldest child) is rather afraid of him. The mother compensates for the father's strictness by corresponding tenderness, to which the boy responds so much that he never gets away from his mother's apron-strings. He never plays with his schoolfellows, never goes alone into the street unless he has to go to school. He fears the boys' roughness and violence and plays thoughtful games at home or helps his mother with housework. He is extremely jealous of his father. He cannot bear it when the father shows tenderness to the mother.

I took the boy aside and asked him about his dreams.

He dreams very often of a *black snake which wants to bite his face*. Then he cries out, and his mother has to come from the next room to his bedside.

In the evening he goes quietly to bed. But when he falls asleep it seems to him that a wicked *black man with a sabre or gun lies on his bed—a tall, thin man who wants to kill him*.

His parents sleep in the adjoining room. It often seems to him that something dreadful is going on there, as if there are great *black snakes or wicked men who want to kill his Mamma*. Then he has to cry out and his mother comes to comfort him.

Every time he wets his bed he calls his mother, who has to settle him down again in dry things.

The father is a tall thin man. Every morning he stands at the washstand naked in full view of the child, to perform a thorough ablution. The child also tells me that at night he is often suddenly waked from sleep by a strange sound in the next room; then he is always horribly afraid as if something dreadful were going on in there, some struggle—but his mother quiets him, says there's nothing to be afraid of.

It is not difficult to see whence comes the black snake and who the wicked man is, and what is happening in the next room. It is equally easy to understand the boy's aim when he calls out for his mother: he is jealous and separates her from the father. This he does also in the daytime whenever he sees his father caressing her. So far the boy is simply his father's rival for his mother's love.

But now comes the circumstance that the snake and the bad man also threaten him, there happens to him the same thing as to his mother in the next room. Thus he identifies himself with his mother and proposes a similar relationship for himself with his father. That is owing to his homosexual component which feels like a woman towards the father. What enuresis signifies in this case is, from the Freudian standpoint, not difficult to understand. The micturition dream throws light upon it. Let me refer to an analysis of the same kind in my article: "L'analyse des rêves, Année psychologique" (1909). Enuresis must be regarded as an infantile sex-surrogate; in the dream-life of adults too it is easily used as a cloak for the urge of sexual desire.

This little example shows what goes on in the mind of an eight year old boy, when he is in a position of too much dependence upon his parents, but the blame is also partly due to the too strict father and the too indulgent mother.

The infantile attitude here, it is evident, is nothing but infantile sexuality. If now we survey all the far-reaching possibilities of the infantile constellation, we are forced to say that *in essence our life's fate is identical with the fate of our sexuality*. If Freud and his school devote themselves first and foremost to tracing out the individual's sexuality it is certainly not in order to excite piquant sensations, but to gain a deeper insight into the driving forces that determine that individual's fate. In this we are not saying too much, rather understating the case. If we can strip off the veils shrouding the problems of individual destiny, we can afterwards widen our view from the history of the individual to the history of nations. And first of all we can look at the history of religions, at the history of the phantasy-systems of whole peoples and epochs. The religion of the Old Testament elevated the *paterfamilias* to the Jehovah of the Jews whom the people had to obey in fear and dread. The Patriarchs are an intermediate stage towards the deity. The neurotic fear and dread of the Jewish religion, the imperfect,

not to say unsuccessful attempt at the sublimation of a still too barbarous people, gave rise to the excessive severity of the Mosaic Law, the ceremonial constraint of the neurotic.^[159]

Only the prophets succeeded in freeing themselves from this constraint; in them the identification with Jehovah, the complete sublimation, is successful. They became the fathers of the people. Christ, the fulfilment of prophecy, put an end to this fear of God and taught mankind that the true relation to the Godhead is "love." Thus he destroyed the ceremonial constraint of the Law and gave the example of a personal loving relationship to God. The later imperfect sublimation of the Christian Mass leads again to the ceremonial of the Church from which occasionally the minds capable of sublimation among the saints and reformers have been able to free themselves. Not without cause therefore does modern theology speak of "inner" or "personal" experiences as having great enfranchising power, for always the ardour of love transmutes the dread and constraint into a higher, freer type of feeling.

What we see in the development of the world-process, the original source of the changes in the Godhead, we see also in the individual. Parental power guides the child like a higher controlling fate. But when he begins to grow up, there begins also the conflict between the infantile constellation and the individuality, the parental influence dating from the prehistoric (infantile) period is repressed, sinks into the unconscious but is not thereby eliminated; by invisible threads it directs the individual creations of the ripening mind as they appear. Like everything that has passed into the unconscious, the infantile constellation sends up into consciousness dim, foreboding feelings, feelings of mysterious guidance and opposing influences. Here are the roots of the first religious sublimations. In the place of the father, with his constellating virtues and faults, there appears, on the one hand, an altogether sublime deity, on the other the devil, in modern times for the most part largely whittled away by the perception of one's own moral responsibility. Elevated love is attributed to the former, a lower sexuality to the latter. As soon as we approach the territory of the neurosis, the antithesis is stretched to the utmost limit. God becomes the symbol of the most complete sexual repression, the Devil the symbol of sexual lust. Thus it is that the conscious expression of the father-constellation, like every expression of an unconscious complex when it appears in consciousness,

gets its Janus-face, its positive and its negative components. A curious, beautiful example of this crafty play of the unconscious is seen in the love-episode in the Book of Tobias. Sarah, the daughter of Raguel in Ecbatana, desires to marry; but her evil fate wills it that seven times, one after another, she chooses a husband who dies on the marriage-night. The evil spirit Asmodi, by whom she is persecuted, kills these husbands. She prays to Jehovah to let her die rather than suffer this shame again. She is despised even by her father's maid-servants. The eighth bridegroom, Tobias, is sent to her by God. He too is led into the bridal-chamber. Then the old Raguel, who has only pretended to go to bed, gets up again and goes out and digs his son-in-law's grave beforehand, and in the morning sends a maid to the bridal-chamber to make sure of the expected death. But this time Asmodi's part is played out, Tobias is alive.

Unfortunately medical etiquette forbids me to give a case of hysteria which fits in exactly with the above instance, except that there were not seven husbands, but only three, ominously chosen under all the signs of the infantile constellation. Our first case too comes under this category and in our third we see the old peasant at work preparing to dedicate his daughter to a like fate.

As a pious and obedient daughter (compare her beautiful prayer in chapter iii.) Sarah has brought about the usual sublimation and cleavage of the father-complex and on the one side has elevated her childish love to the adoration of God, on the other has turned the obsessive force of her father's attraction into the persecuting demon Asmodi. The legend is so beautifully worked out that it displays the father in his twofold aspect, on the one hand as the inconsolable father of the bride, on the other as the secret digger of his son-in-law's grave, whose fate he foresees. This beautiful fable has become a cherished paradigm for my analysis, for by no means infrequent are such cases where the father-demon has laid his hand upon his daughter, so that her whole life long, even when she does marry, there is never a true union, because her husband's image never succeeds in obliterating the unconscious and eternally operative infantile father-ideal. This is valid not only for daughters, but equally for sons. A fine instance of such a father-constellation is given in Dr. Brill's recently published: "Psychological factors in dementia præcox. An analysis."^[160]

In my experience the father is usually the decisive and dangerous object of the child's phantasy, and if ever it happens to be the mother, I have been able to discover behind her a grandfather to whom she belonged in her heart.

I must leave this question open: my experience does not go far enough to warrant a decision. It is to be hoped that the experience of the coming years will sink deeper shafts into this still dark land which I have been able but momentarily to light up, and will discover to us more of the secret workshop of that fate-deciding demon of whom Horace says:

"Scit Genius natale comes qui temperat astrum,
Naturæ deus humanæ, mortalis in unum,
Quodque caput, vultu mutabilis, albus et ater."

CHAPTER IV

A CONTRIBUTION TO THE PSYCHOLOGY OF RUMOUR^[161]

About a year ago the school authorities in N. asked me to give a professional opinion as to the mental condition of Marie X., a thirteen year old schoolgirl. Marie had been expelled from school because she had been instrumental in originating an ugly rumour, spreading gossip about her class-teacher. The punishment hit the child, and especially her parents, very hard, so that the school authorities were inclined to readmit her if protected by a medical opinion. The facts were as follows:—

The teacher had heard indirectly that the girls were attributing some equivocal sexual story to him. On investigation it was found that Marie X. had one day related a dream to three girlfriends which ran somewhat as follows:—

"The class was going to the swimming-baths. I had to go to the boys' because there was no more room. Then we swam a long way out in the lake (asked 'who did so': 'Lina P., the teacher, and myself'). A steamer came along. The teacher asked us if we wished to get into it. We came to K. A wedding was just going on there (asked 'whose': 'a friend of the teacher's'). We were also to take part in it. Then we went for a journey (who? 'I, Lina P., and the teacher'). It was like a honeymoon journey. We came to Andermatt, and there was no more room in the hotel, so we were obliged to pass the night in a barn. The woman got a child there, and the teacher became the godfather."

When I examined the child she told this dream. The teacher had likewise related the dream in writing. In this earlier version the obvious blanks after the word "steamer" in the above text were filled up as follows: "We got up. Soon we felt cold. An old man gave us a blouse which the teacher put on." On the other hand, there was an omission of the passage about finding no room in the hotel and being obliged to pass the night in the barn.

The child told the dream immediately, not only to her three friends but also to her mother. The mother repeated it to me with only trifling differences from the two versions given above. The teacher, in his further investigations, carried out with deepest misgivings, failed, like myself, to get indications of any more dangerous material. There is therefore a strong probability that the original recital could not have run very differently. (The passage about the cold and the blouse seems to be an early interpolation, for it is an attempt to supply a logical relationship. Coming out of the water one is wet, has on only a bathing dress, and is therefore unable to take part in a wedding before putting on some clothes.) At first, of course, the teacher would not allow that the whole affair had arisen only out of a dream. He rather suspected it to be an invention. He was, however, obliged to admit that the innocent telling of the dream was apparently a fact, and that it was unnatural to regard the child as capable of such guile as to indicate some sexual equivocation in this disguised form. For a time he wavered between the view that it was a question of cunning invention, and the view that it was really a question of a dream, innocent in itself, which had been understood by the other

children in a sexual way. When his first indignation wore off he concluded that Marie X.'s guilt could not be so great, and that her phantasies and those of her companions had contributed to the rumour. He then did something really valuable. He placed Marie's companions under supervision, and made them all write out what they had heard of the dream.

Before turning our attention to this, let us cast a glance at the dream analytically. In the first place, we must accept the facts and agree with the teacher that we have to do with a dream and not with an invention; for the latter the ambiguity is too great. Conscious invention tries to create unbroken transitions; the dream takes no account of this, but sets to work regardless of gaps, which, as we have seen, here give occasion for interpolations during the conscious revision. The gaps are very significant. In the swimming-bath there is no picture of undressing, being unclothed, nor any detailed description of their being together in the water. The omission of being dressed on the ship is compensated for by the above-mentioned interpolation, but only for the teacher, thus indicating that his nakedness was in most urgent need of cover. The detailed description of the wedding is wanting, and the transition from the steamer to the wedding is abrupt. The reason for stopping overnight in the barn at Andermatt is not to be found at first. The parallel to this is, however, the want of room in the swimming-bath, which made it necessary to go into the men's department; in the hotel the want of room again emphasises the separation of the sexes. The picture of the barn is most insufficiently filled out. The birth suddenly follows and quite without sequence. The teacher as godfather is extremely equivocal. Marie's rôle in the whole story is throughout of secondary importance, indeed she is only a spectator.

All this has the appearance of a genuine dream, and those of my readers who have a wide experience of the dreams of girls of this age will assuredly confirm this view. Hence the meaning of the dream is so simple that we may quietly leave its interpretation to her school-companions, whose declarations are as follows:

AURAL WITNESSES.

Witness I.—"M. dreamed that she and Lina P. had gone swimming with our teacher. After they had swum out in the lake pretty far, M. said she could not swim any further as her foot hurt her so much. The teacher said she might sit on my^[162] back. M. got up and they swam out. After a time a steamer came along and they got up on it. Our teacher seems to have had a rope by which he tied M. and L. together and dragged them out into the lake. They travelled thus as far as Z., where they stepped out. But now they had no clothes on. The teacher bought a jacket whilst M. and L. got a long, thick veil, and all three walked up the street along the lake. This was when the wedding was going on. Presently they met the party. The bride had on a blue silk dress but no veil. She asked M. and L. if they would be kind enough to give her their veil. M. and L. gave it, and in return they were allowed to go to the wedding. They went into the Sun Inn. Afterwards they went a honeymoon journey to Andermatt; I do not know now whether they went to the Inn at A. or at Z. There they got coffee, potatoes, honey, and butter."

"I must not say any more, only the teacher finally was made godfather."

Remarks.—The roundabout story concerning the want of room in the swimming-bath is absent; Marie goes direct with her teacher to the bath. Their persons are more closely bound together in the water by means of the rope fastening the teacher and the two girls together. The ambiguity of the "getting up" in the first story has other consequences here, for the part about the steamer in the first story now occurs in two places; in the first the teacher takes Marie on his back. The delightful little slip "she could sit on my back" (instead of *his*), shows the real part taken by the narrator herself in this scene. This makes it clear why the dream brings the steamer somewhat abruptly into action, in order to give an innocent, harmless turn to the equivocal "getting up" instead of another which is common, for instance, in music-hall songs. The passage about the want of clothing, the uncertainty of which has been already noticed, arouses the special interest of the narrator. The teacher buys a jacket, the girls get a long veil (such as one only wears in case of death or at weddings). That the latter is meant is shown by the remark that the bride had none (it is the bride who wears the veil). The narrator, a girl-friend of Marie, here helps the dreamer to dream further: the possession of the veil designates the bride or the brides, Marie and Lina. Whatever is shocking or immoral in this situation is relieved by the girls giving up the veil; it then takes an innocent turn. The narrator follows the same mechanism in the cloaking of the equivocal scene at Andermatt; there is nothing but nice food, coffee, potatoes, honey, butter, a turning back to the infantile life according to the well-known method. The conclusion is apparently very abrupt: the teacher becomes a godfather.

Witness II.—M. dreamt she had gone bathing with L. P. and the teacher. Far out in the lake M. said to the teacher that her leg was hurting her very much. Then the teacher said she could get up on him. I don't know now whether the last sentence was really so told, but I think so. As there was just then a ship on the lake the teacher said she should swim as far as the ship and then get in. I don't remember exactly how it went on. Then the teacher or M., I don't really remember which, said they would get out at Z. and run home. Then the teacher called out to two gentlemen who had just been bathing there, that they might carry the children to land. Then L. P. sat up on one man, and M. on the other fat man, and the teacher held on to the fat man's leg and swam after them. Arrived on land they ran home. On the way the teacher met his friend who had a wedding. M. said: "It was then the fashion to go on foot, not in a carriage." Then the bride said she must now go along also. Then the teacher said it would be nice if the two girls gave the bride their black veils, which they had got on the way. I can't now remember how. The children gave it her, and the bride said they were really dear generous children. Then they went on further and put up at the Sun Hotel. There they got something to eat, I don't know exactly what. Then they went to a barn and danced. All the men had taken off their coats except the teacher. Then the bride said he ought to take off his coat also. Then the teacher hesitated but finally did so. Then the teacher was.... Then the teacher said he was cold. I must not tell any more; it is improper. That's all I heard of the dream.

Remarks.—The narrator pays special attention to the getting up, but is uncertain whether in the original it referred to getting up on the teacher or the steamer. This uncertainty is, however, amply compensated for by the elaborate invention of the two strangers who take the girls upon their backs. The getting up is too valuable a thought for the narrator to surrender, but she is troubled by the idea of the teacher seeing the object. The want of clothing likewise arouses much interest. The bride's veil has, it is true, become the black veil of mourning

(naturally in order to conceal anything indelicate). There is not only no innocent twisting, but it is conspicuously virtuous ("dear, generous children"); the amoral wish has become changed into virtue which receives special emphasis, arousing suspicion as does every accentuated virtue.

This narrator exuberantly fills in the blanks in the scene of the barn: the men take off their coats; the teacher also, and is therefore ... *i.e.* naked and hence cold. Whereupon it becomes too improper.

The narrator has correctly recognised the parallels which were suspected in the criticisms of the original dream; she has filled in the scene about the undressing which belongs to the bathing, for it must finally come out that the girls are together with the naked teacher.

Witness III.—M. told me she had dreamt: Once I went to the baths but there was no room for me. The teacher took me into his dressing-room. I undressed and went bathing. I swam until I reached the bank. Then I met the teacher. He said would I not like to swim across the lake with him. I went, and L. P. also. We swam out and were soon in the middle of the lake. I did not want to swim any further. Now I can't remember it exactly. Soon a ship came up, and we got up on the ship. The teacher said, "I am cold," and a sailor gave us an old shirt. The three of us each tore a piece of the shirt away. I fastened it round the neck. Then we left the ship and swam away towards K.

L. P. and I did not want to go further, and two fat men took us upon their backs. In K. we got a veil which we put on. In K. we went into the street. The teacher met his friend who invited us to the wedding. We went to the Sun and played games. We also danced the polonaise; now I don't remember exactly. Then we went for a honeymoon journey to Andermatt. The teacher had no money with him, and stole some chestnuts in Andermatt. The teacher said, "I am so glad that I can travel with my two pupils." Then there is something improper which I will not write. The dream is now finished.

Remarks.—The undressing together now takes place in the narrow space of the dressing-room at the baths. The want of dress on the ship gives occasion to a further variant. (The old shirt torn in three.) In consequence of great uncertainty the getting up on the teacher is not mentioned. Instead, the two girls get up on two fat men. As "fat" becomes so prominent it should be noted that the teacher is more than a little plump. The setting is thoroughly typical; each one has a teacher. The duplication or multiplication of the persons is an expression of their significance, *i.e.* of the stored-up libido.^[163] (Compare the duplication of the attribute in dementia præcox in my "Psychology of Dementia Præcox.") In cults and mythologies the significance of this duplication is very striking. (Cp. the Trinity and the two mystical formulas of confession: "Isis una quæ es omnia. Hermes omnia solus et ter unus.") Proverbially we say he eats, drinks, or sleeps "for two." The multiplication of the personality expresses also an analogy or comparison—*my friend* has the same "ætiological value" (Freud) as *myself*. In dementia præcox, or schizophrenia, to use Bleuler's wider and better term, the multiplication of the personality is mainly the expression of the stored-up libido, for it is invariably the person to whom the patient has transference who is subjected to this multiplication. ("There are two professors N." "Oh, you are also Dr. J.; this morning another came to see me who called himself Dr. J.") It seems that, corresponding to the general tendency in schizophrenia, this splitting is an analytic degradation whose motive is to prevent the arousing of too violent

impressions. A final significance of the multiplication of personality which, however, does not come exactly under this concept is the raising of some attribute of the person to a living figure. A simple instance is Dionysos and his companion Phales, wherein Phales is the equivalent of Phallos, the personification of the penis of Dionysos. The so-called attendants of Dionysos (Satyri, Sileni, Mænades, Mimallones, etc.) consist of the personification of the attributes of Dionysos.

The scene in Andermatt is portrayed with a nice wit, or more properly speaking, dreamt further: "The teacher steals chestnuts," that is equivalent to saying he does what is prohibited. By chestnuts is meant roasted chestnuts, which on account of the incision are known as a female sexual symbol. Thus the remark of the teacher, that he was especially glad to travel with his pupils, following directly upon the theft of the chestnuts, becomes intelligible. This theft of the chestnuts is certainly a personal interpolation, for it does not occur in any of the other accounts. It shows how intensive was the inner participation of the school companions of Marie X. in the dream, resting upon similar ætiological requirements.

This is the last of the aural witnesses. The story of the veil, the pain in the feet, are items which we may perhaps suspect to have been suggested in the original narrative. Other interpolations are, however, absolutely personal, and are due to independent inner participation in the meaning of the dream.

HEARSAY EVIDENCE.

(I.) The whole school had to go bathing with the teacher. M. X. had no place in the bath in which to undress. Then the teacher said: "You can come into my room and undress with me." She must have felt very uncomfortable. When both were undressed they went into the lake. The teacher took a long rope and wound it round M. Then they both swam far out. But M. got tired, and then the teacher took her upon his back. Then M. saw Lina P.; she called out to her, Come along with me, and Lina came. Then they all swam out still farther. They met a ship. Then the teacher asked, "May we get in? these girls are tired." The boat stopped, and they could all get up. I do not know exactly how they came ashore again at K. Then the teacher got an old night-shirt. He put it on. Then he met an old friend who was celebrating his wedding. The teacher, M. and L. were invited. The wedding was celebrated at the Crown in K. They wanted to play the polonaise. The teacher said he would not accompany them. Then the others said he might as well. He did it with M. The teacher said: "I shall not go home again to my wife and children. I love you best, M." She was greatly pleased. After the wedding there was the honeymoon journey. The teacher, M. and L. had to accompany the others also. The journey was to Milan. Afterwards they went to Andermatt, where they could find no place to sleep. They went to a barn, where they could stop the night all together. I must not say any more because it becomes highly improper.

Remarks.—The undressing in the swimming-bath is properly detailed. The union in the water receives a further simplification for which the story of the rope led the way; the teacher fastens himself to Marie. Lina P. is not mentioned at all; she only comes later when Marie is already sitting upon the teacher. The dress is here a jacket. The wedding ceremony contains a very direct meaning. "The teacher will not go home any more to wife and child." Marie is the darling. In the barn they all found a place together, and then it becomes highly improper.

(II.) It was said that she had gone with the school to the swimming-baths to bathe. But as the baths were over-full the teacher had called her to come to him. We swam out to the lake, and L. P. followed us. Then the teacher took a string and bound us to one another. I do not know now exactly how they again got separated. But after a long time they suddenly arrived at Z. There a scene is said to have taken place which I would rather not tell, for if it were true it would be too disgraceful; also now I don't know exactly how it is said to have been, for I was very tired, only I also heard that M. X. is said to have told how she was always to remain with our teacher, and he again and again caressed her as his favourite pupil. If I knew exactly I would also say the other thing, but my sister only said something about a little child which was born there, and of which the teacher was said to have been the godfather.

Remarks.—Note that in this story the improper scene is inserted in the place of the wedding ceremony, where it is as apposite as at the end, for the attentive reader will certainly have already observed that the improper scene could have taken place in the swimming-bath dressing-room. The procedure has been adopted which is so frequent in dreams as a whole; the final thoughts of a long series of dream images contain exactly what the first image of the series was trying to represent. The censor pushes the complex away as long as possible through ever-renewed disguises, displacements, innocent renderings, etc. It does not take place in the bathing-room, in the water the "getting up" does not occur, on landing it is not on the teacher's back that the girls are sitting, it is another pair who are married in the barn, another girl has the child, and the teacher is only—godfather. All these images and situations are, however, directed to pick out the complex, the desire for coitus. Nevertheless the action still occurs at the back of all these metamorphoses, and the result is the birth placed at the end of the scene.

(III.) Marie said: the teacher had a wedding with his wife, and they went to the "Crown" and danced with one another. M. said a lot of wild things which I cannot repeat or write about, for it is too embarrassing.

Remarks.—Here everything is too improper to be told. Note that the marriage takes place with the wife.

(IV.) ... that the teacher and M. once went bathing, and he asked M. whether she wanted to come along too. She said "yes." When they had gone out together they met L. P., and the teacher asked whether she wished to come along. And they went out farther. Then I also heard that she said that the teacher said L. P. and she were the favourite pupils. She also told us that the teacher was in his swimming drawers. Then they went to a wedding, and the bride got a little child.

Remarks.—The personal relationship to the teacher is strongly emphasised (the "favourite pupils"), likewise the want of clothing ("swimming drawers").

(V.) M. and L. P. went bathing with the teacher. When M. and L. P. and the teacher had swum a little way, M. said: "I cannot go any further, teacher, my foot hurts me." Then the teacher said she should sit on his back, which M. did. Then a small steamer came along, and the teacher got into the ship. The teacher had also two ropes, and he fastened both children to the ship. Then they went together to Z. and got out there. Then the teacher bought himself a dressing jacket and put it on, and the children had put a cloth over themselves. The teacher

had a bride, and they were in a barn. Both children were with the teacher and the bride in the barn, and danced. I must not write the other thing, for it is too awful.

Remarks.—Here Marie sits upon the teacher's back. The teacher fastens the two children by ropes to the ship, from which it can be seen how easily ship is put for teacher. The jacket again emerges as the piece of clothing. It was the teacher's own wedding, and what is improper comes after the dance.

(VI.) The teacher is said to have gone bathing with the whole school. M. could not find any room, and she cried. The teacher is said to have told M. she could come into his dressing-room.

"I must leave out something here and there," said my sister, "for it is a long story." But she told me something more which I must tell in order to speak the truth. When they were in the bath the teacher asked M. if she wished to swim out into the lake with him. To which she replied, "If I go along, you come also." Then we swam until about half-way. Then M. got tired, and then the teacher pulled her by a cord. At K. they went on land, and from there to Z. (The teacher was all the time dressed as in the bath.) There we met a friend, whose wedding it was. We were invited by this friend. After the ceremony there was a honeymoon journey, and we came to Milan. We had to pass one night in a barn where something occurred which I cannot say. The teacher said we were his favourite pupils, and he also kissed M.

Remarks.—The excuse "I must leave out something here and there" replaces the undressing. The teacher's want of clothing is emphasised. The journey to Milan is a typical honeymoon. This passage also seems to be an independent fancy, due to some personal participation. Marie clearly figures as the loved one.

(VII.) The whole school and the teacher went bathing. They all went into one room. The teacher also. M. alone had no place, and the teacher said to her, "I have still room," she went. Then the teacher said, "Lie on my back, I will swim out into the lake with you." I must not write any more, for it is improper; I can hardly say it at all. Beyond the improper part which followed I do not know any more of the dream.

Remarks.—The narrator approaches the basis. Marie is to lie upon the teacher's back in the bathing compartment. Beyond the improper part she cannot give any more of the dream.

(VIII.) The whole school went bathing. M. had no room and was invited by the teacher into his compartment. The teacher swam out with her and told her that she was his darling or something like that. When they got ashore at Z. a friend was just having a wedding and he invited them both in their swimming costumes. The teacher found an old dressing jacket and put it over the swimming drawers. He (the teacher) also kissed M. and said he would not return home to his wife any more. They were also both invited on the honeymoon journey. On the journey they passed Andermatt, where they could not find any place to sleep, and so had to sleep in the hay. There was a woman; the dreadful part now comes, it is not at all right to make something serious into mockery and laughter. This woman got a small child. I will not say any more now, for it becomes too dreadful.

Remarks.—The narrator is thoroughgoing. (He told her simply she was his darling. He kissed her and said he would not go home to his wife.) The vexation about the silly tattling which breaks through at the end suggests some peculiarity in the narrator. From subsequent

investigation it was found that this girl was the only one of the witnesses who had been early and intentionally given an explanation about sex by her mother.

EPICRISIS.

So far as the interpretation of the dream is concerned, there is nothing for me to add; the children have taken care of all the essentials, leaving practically nothing over for psychoanalytic interpretation. *Rumour has analysed and interpreted the dream.* So far as I know rumour has not hitherto been investigated in this new capacity. This case certainly makes it appear worth while to fathom the psychology of rumour. In the presentation of the material I have purposely restricted myself to the psychoanalytic point of view, although I do not deny that my material offers numerous openings for the invaluable researches of the followers of Stern, Claparède, and others.

The material enables us to understand the structure of the rumour, but psychoanalysis cannot rest satisfied with that. The why and wherefore of the whole manifestation demands further knowledge. As we have seen, the teacher, astonished by this rumour, was left puzzled by the problem, wondering as to its cause and effect. How can a dream which is notoriously incorrect and meaningless (for teachers are, as is well known, grounded in psychology) produce such effects, such malicious gossip? Faced by this, the teacher seems to have instinctively hit upon the correct answer. The effect of the dream can only be explained by its being "le vrai mot de la situation," *i.e.* that the dream formed the fit expression for something that was already in the air. It was the spark which fell into the powder magazine. The material contains all the proofs essential for this view. I have repeatedly drawn attention to their own unrecognised participation in the dream by Marie's school-companions, and the special points of interest where any of them have added their own phantasies or dreams. The class consists of girls between twelve and thirteen years of age, who therefore are in the midst of the prodromata of puberty. The dreamer Marie X. is herself physically almost completely developed sexually, and in this respect ahead of her class; she is therefore a leader who has given the watchword for the unconscious, and thus brought to expression the sexual complexes of her companions which were lying there ready prepared.

As can be easily understood, the occasion was most painful to the teacher. The supposition that therein lay some secret motive of the schoolgirls is justified by the psychoanalytic axiom—judge actions by their results rather than by their conscious motives.^[164] Consequently it would be probable that Marie X. had been especially troublesome to her teacher. Marie at first liked this teacher most of all. In the course of the latter half-year her position had, however, changed. She had become dreamy and inattentive, and towards the dusk of evening was afraid to go into the streets for fear of bad men. She talked several times to her companions about sexual things in a somewhat obscene way; her mother asked me anxiously how she should explain the approaching menstruation to her daughter. On account of this alteration in conduct Marie had forfeited the good opinion of her teacher, as was clearly evidenced for the first time by a school report, which she and some of her friends had received a few days before the outbreak of the rumour. The disappointment was so great that the girls had imagined all kinds of fancied acts of revenge against the teacher; for instance, they might push him on to the lines so that the train would run over him, etc. Marie was especially to the fore in these

murderous phantasies. On the night of this great outburst of anger, when her former liking for her teacher seemed quite forgotten, that repressed part of herself announced itself in the dream, and fulfilled its desire for sexual union with the teacher—as a compensation for the hate which had filled the day.

On waking, the dream became a subtle instrument of her hatred, because the wish-idea was also that of her school companions, as it always is in rumours of this kind. Revenge certainly had its triumph, but the recoil upon Marie herself was still more severe. Such is the rule when our impulses are given over to the unconscious. Marie X. was expelled from school, but upon my report she was allowed to return to it.

I am well aware that this little communication is inadequate and unsatisfactory from the point of view of exact science. Had the original story been accurately verified we should have clearly demonstrated what we have now been only able to suggest. This case therefore only posits a question, and it remains for happier observers to collect convincing experiences in this field.

CHAPTER V

ON THE SIGNIFICANCE OF NUMBER-DREAMS^[165]

The symbolism of numbers which greatly engaged the imaginative philosophy of earlier centuries has again acquired a fresh interest from the analytic investigations of Freud and his school. But in the material of number-dreams we no longer discover conscious puzzles of symbolic concatenations of numbers but the unconscious roots of the symbolism of numbers. There is scarcely anything quite fundamentally new to offer in this sphere since the presentations of Freud, Adler and Stekel. It must here suffice to corroborate their experiences by recording parallel cases. I have had under observation a few cases of this kind which are worth reporting for their general interest.

The first three instances are from a middle-aged married man whose conflict of the moment was an extra-conjugal love affair. The piece of the dream from which I take the symbolised number is: *in front of the manager his general subscription. The manager comments on the high number of the subscription. It reads 2477.*

The analysis of the dream brings out a rather ungentlemanly reckoning up of the expense of the affair, which is foreign to the generous nature of the dreamer, and which the unconscious makes use of as a resistance to this affair. The preliminary interpretation is, therefore, that the number has some financial importance and origin. A rough estimate of the expenses so far leads to a number which in fact approaches 2477 francs; a more exact reckoning, however, gives 2387 francs, which could be only arbitrarily translated into 2477. I then left the numbers to the free association of the patient; it occurs to him that the figure in the dream should be divided as 24-77. Perhaps it is a telephone number; this supposition proves incorrect. The next association is that it is the total of some numbers. A reminiscence then occurs to him that he once told me that he had celebrated the 100th birthday of his mother and himself when his mother was 65 and he was 35 years old. (Their birthdays are on the same day.)

In this way the patient arrived at the following series of associations:—

He is born on	26 II.
His mistress	28 VIII.
His wife	1 III.
His mother (his father is long dead)	26 II.
His two children	29 IV.
	and 13 VII.
The patient is born	II. 75.
His mistress	VIII. 85.

He is now 36 years old, his mistress 25.

If this series of associations is written in the usual figures, the following addition is arrived at:

$$\begin{array}{r} 26. \text{ II.} = 262 \\ 28. \text{ VIII.} = 288 \\ 1. \text{ III.} = 13 \\ 26. \text{ II.} = 262 \\ 29. \text{ IV.} = 294 \\ 13. \text{ VII.} = 137 \\ \text{II. } 75. = 275 \\ \text{VIII. } 85 = 885 \\ 25 = 25 \\ 36 = 36 \\ \hline 2477 \end{array}$$

This series, which includes all the members of his family, gives the number 2477.

This construction led to a deeper layer of the dream's meaning. The patient is most closely united to his family, but on the other hand very much in love. This situation provokes a severe conflict. The detailed description of the manager's appearance (which I leave out for the sake of brevity) pointed to the analyst, from whom the patient rightly fears and desires firm control and criticism of his condition of dependence and bondage.

The dream which followed soon afterwards, reported in brief, runs: *The analyst asks the patient what he actually does at his mistress'? to which the patient replied he plays there, and that indeed on a very high number, on 152. The analyst remarks: "You are sadly cheated."*

The analysis displayed again a repressed tendency to reckon up the expense of the affair. The amount spent monthly was close on 152 francs, it was from 148-158 francs. The remark that he was being cheated alludes to the point at issue in the difficulties of the patient with his mistress. She maintains that he had deflowered her; he, on the contrary, is firmly convinced that she was not a virgin, and that she had already been seduced by some one else at the time when he was seeking her favours and she was refusing him. The expression "number" leads to the associations: number of the gloves, calibre-number. From there the next step was to the fact that he recognized, at the first coitus, a noticeable width of the opening instead of the expected resistance of the hymen. To him, this is proof of the deception. The unconscious naturally makes use of this opportunity as an effective means of opposition to the relationship. 152 proves at first refractory to further analysis. The number on a subsequent occasion aroused the really not remote association, "house-number." Then came this series of associations. When the patient first knew her the lady lived at X Street No. 17, then Y Street No. 129, then Z Street No. 48.

Here the patient thought that he had clearly gone far beyond 152, the total being 194. It then occurred to him that the lady had removed from No. 48 Z Street at his instigation for certain reasons; it must therefore run $194 - 48 = 146$. She now lives in A Street No. 6, therefore $146 + 6 = 152$.

The following dream was obtained during a later part of the analysis. The patient dreamt that *he had received an account from the analyst in which he was charged interest for delay in payment from the period September 3rd to 29th. The interest on the total of 315 francs was 1 franc.*

Under this reproach of meanness and avariciousness levelled at the analyst, the patient covered, as analysis proved, a violent unconscious envy. Diverse things in the life of the analyst can arouse the patient's envy; one fact here in particular had recently made a marked impression. His physician had received an addition to the family. The disturbed relations between the patient and his wife unfortunately does not permit such an expectation in his case. Hence his ground for envy and invidious comparisons.

As before, the analysis of 315 produces a separation into 3—1—5. To three he associates—his doctor has three children, just lately there is one in addition. He himself would have five children were all living; as it is he has $3 - 1 = 2$ living; for three of the children were stillborn. The symbolism of the numbers is not exhausted by these associations.

The patient remarks that the period from 3rd to 29th September contains twenty-six days. His next thought is to add this and the other figures of the dream:

$$\begin{array}{r} 26 \\ 315 \\ 1 \\ \hline 342 \\ \hline \end{array}$$

With 342 he carries out the same operation as on 315, splitting it into 3—4—2. Whereas before it came out that his doctor had three children, and then had another, and the patient had five, now it runs: the doctor had three children, and now has four, patient has only two. He remarks on this that the second figure sounds like a rectification in contrast with the wish-fulfilment of the first.

The patient, who had discovered this explanation for himself without my help, declared himself satisfied. His physician, however, was not; to him it seemed that the above disclosures did not exhaust the rich possibilities that determined the unconscious images. The patient had, for instance, added to the figure five that of the stillborn children; one was born in the 9th month and two in the 7th. He also emphasised the fact that his wife had had two miscarriages, one in the 5th week and the other in the 7th. Adding these figures together we get the determination of the number 26.

	Child of	7	months
	"	"7	"
	"	"9	"
		<hr style="width: 1em; margin: 0 auto;"/>	"
		23	"
2 miscarriages (5 + 7 weeks)	3		"
		<hr style="width: 1em; margin: 0 auto;"/>	

It seems as if the number twenty-six were determined by the number of the lost times of pregnancy. This time (twenty-six days) denotes, in the dream, a delay for which the patient was charged one franc interest. He has, in fact, suffered a delay through the lost pregnancies, for his doctor has, during the time the patient has known him, surpassed him with one child. One franc must be one child. We have already seen the tendency of the patient to add together all his children, even the dead ones, in order to outdo his rival. The thought that his physician had outdone him by one child could easily react immediately upon the determination of 1. We will therefore follow up this tendency of the patient and carry on his play with figures, by adding to the figure 26 the two complete pregnancies of nine months each.

$$26 + 9 + 9 = 44$$

If we follow the tendency to split up the numbers we get $2 + 6$ and $4 + 4$, two groups of figures which have only this in common, that each group gives 8 by addition. These numbers are, as we must notice, composed entirely of the months of pregnancy given by the patient. Compare with them those groups of figures which contain the information as to the doctor's fecundity, viz. 315 and 342; it is to be noted that the resemblance lies in their sum-total giving $9 : 9 - 8 = 1$. It looks as if here likewise the notion about the differentiation of 1 were carried out. As the patient remarked, 315 seems thus a wish-fulfilment, 342 on the other hand a rectification. An ingenious fancy playing round will discover the following difference between the two numbers:

$$3 \times 1 \times 5 = 15. \quad 3 \times 4 \times 2 = 24. \quad 24 - 15 = 9$$

Here again we come upon the important figure 9, which neatly combines the reckoning of the pregnancies and births.

It is difficult to say where the borderline of play begins; necessarily so, for the unconscious product is the creation of a sportive fancy, of that psychic impulse out of which play itself arises. It is repugnant to the scientific mind to have serious dealings with this element of play, which on all sides loses itself in the vague. But it must be never forgotten that the human mind has for thousands of years amused itself with just this kind of game; it were therefore nothing wonderful if this historic past again compelled admission in dream to similar tendencies. The patient pursues in his waking life similar phantastic tendencies about figures, as is seen in the fact already mentioned of the celebration of the 100th birthday. Their presence in the dream therefore need not surprise us. In a single example of unconscious determination exact proofs are often lacking, but the sum of our experiences entitles us to rely upon the accuracy of the individual discoveries. In the investigation of free creative phantasy we are in the region, almost more than anywhere else, of broad empiricism; a high measure of discretion as to the accuracy of individual results is consequently required, but this in nowise obliges us to pass over in silence what is active and living, for fear of being execrated as unscientific. There must be no parleying with the superstition-phobia of the modern mind; for this itself is a means by which the secrets of the unconscious are kept veiled.

It is of special interest to see how the problems of the patient are mirrored in the unconscious of his wife. His wife had the following dream: She dreamt, and this is the whole dream: "*Luke*

137." The analysis of the number gives the following. To 1 she associates: The doctor has another child. He had three. If all her children were living she would have 7; now she has only $3 - 1 = 2$. But she desires $1 + 3 + 7 = 11$ (a twin number, 1 and 1), which expresses her wish that her two children had been pairs of twins, for then she would have reached the same number of children as the doctor. Her mother once had twins. The hope of getting a child by her husband is very precarious; this had for a long time turned her ideas in the unconscious towards a second marriage. Other phantasies pictured her as "done with," *i.e.* having reached the climacteric at 44. She is now 33 years old, therefore in 11 years she will have reached her 44th year. This is an important period as her father died in his 44th year. Her phantasy of the 44th year contains the idea of the death of her father. The emphasis on the death of her father corresponds to the repressed phantasy of the death of her husband, who is the obstacle to a second marriage. At this place the material belonging to the dream "*Luke 137*" comes in to solve the conflict. The dreamer is, one soon discovers, in no wise well up in her Bible, she has not read it for an incredible time, she is not at all religious. It would be therefore quite purposeless to have recourse to associations here. The dreamer's ignorance of her Bible is so great that she did not even know that the citation "*Luke 137*" could only refer to the Gospel of St. Luke. When she turned up the New Testament she came to the Acts of the Apostles. As chapter i. has only 26 verses and not 37, she took the 7th verse, "It is not for you to know the times or the seasons, which the Father hath put in his own power."

But if we turn to Luke i. 37, we find the Annunciation of the Virgin.

Verse 35. The Holy Ghost shall come upon thee, and the power of the Highest shall overshadow thee: therefore also that holy thing which shall be born of thee shall be called the Son of God.

Verse 36. And, behold, thy cousin Elisabeth, she hath also conceived a son in her old age: and this is the sixth month with her, who was called barren.

Verse 37. For with God nothing shall be impossible.

The necessary continuation of the analysis of "*Luke 137*" demanded the looking up of Luke xiii. 7, where it says:

Verse 6. A certain man had a fig tree planted in his vineyard; and he came and sought fruit thereon, and found none.

Verse 7. Then said he unto the dresser of his vineyard, Behold, these three years I come seeking fruit on this fig tree, and find none: cut it down; why cumbereth it the ground?

The fig-tree, which from antiquity has been a symbol of the male genital, is to be cut down on account of its unfruitfulness. This passage is in complete accord with innumerable sadistic phantasies of the dreamer, concerned with the cutting or biting off of the penis. The relation to her husband's unfruitful organ is obvious. That she withdraws her libido from her husband is clear for he is impotent as regard herself; it is equally clear that she undergoes regression to the father ("which the father hath put in his own power") and identifies herself with her mother who had twins.^[166] By thus advancing her age the dreamer places her husband in regard to herself in the position of a son or boy, of an age at which impotency is normal. Furthermore, the desire to overcome her husband is easily understood from, and amply

evidenced in her earlier analysis. It is therefore only a confirmation of what has been already said, if, following up the matter of "*Luke 137*," we find in Luke vii. verse 12, Now when he came nigh to the gate of the city, behold, there was a dead man carried out, the only son of his mother, and she was a widow. (13) And when the Lord saw her, he had compassion on her, and said unto her, Weep not. (14) And he came and touched the bier: and they that bare him stood still. And he said, Young man, I say unto thee, Arise.

In the particular psychological situation of the dreamer, the allusion to the resurrection presents a delightful meaning as the cure of her husband's impotency. Then the whole problem would be solved. There is no need for me to point out in so many words the numerous wish-fulfilments contained in this material; they are obvious to the reader.

The important combination of the symbol "*Luke 137*" must be conceived as cryptomnesia, since the dreamer is quite unversed in the Bible. Both Flournoy^[167] and myself^[168] have already drawn attention to the important effects of this phenomenon. So far as one can be humanly certain, the question of any manipulation of the material with intent to deceive does not come into consideration in this case. Those well posted in psychoanalysis will be able to allay any such suspicion simply from the disposition and setting of the material as a whole.

CHAPTER VI

A CRITICISM OF BLEULER'S "THEORY OF SCHIZOPHRENIC NEGATIVISM"^[169]

Bleuler's work contains a noteworthy clinical analysis of "Negativism." Besides giving a very precise and discerning summary of the various manifestations of negativism, the author presents us with a new psychological conception well worthy of attention, viz. the concept of *ambivalency* and of *ambitendency*, thus formulating the psychological axiom that every tendency is balanced by its opposite tendency (to this must be added that positive action is produced by *a comparatively small leaning to one side of the scale*). Similarly all other tendencies, under the stress of emotions, are balanced by their opposites—thus giving an *ambivalent* character to their expression. This theory rests on clinical observation of katatonic negativism, which more than proves the existence of contrasting tendencies and values. These facts are well known to psychoanalysis, where they are summed up under the concept of resistance. But this must not be taken as meaning that every positive psychic action simply calls up its opposite. One may easily gain the impression from Bleuler's work that his standpoint is that, *cum grano salis*, the conception or the tendency of the Schizophrenic is always accompanied by its opposite. For instance, Bleuler says:—

1. "Disposing causes of negativistic phenomena are: the *ambitendency* by which every impulse is accompanied by its opposite."
2. "*Ambivalency*, which gives two opposed emotional expressions to the same idea, and would regard that idea as positive and negative at the same time."
3. "*The schizophrenic splitting* of the psyche prevents any final summing up of the conflicting and corresponding psychisms, so that the unsuitable impulse can be realised just as much as the right one, and the negative thought substituted for the right one." "On this theory, negative manifestations may directly arise, since non-selected positive and negative psychisms may stand for one another," and so on.

If we investigate psychoanalytically a case of obvious ambivalency, *i.e.* of a more or less unexpected negative reaction instead of a positive one, we find that there is a strict sequence of psychological causes conditioning negative reaction. The tendency of this sequence is to disturb the intention of the contrasting or opposite series, that is to say, *it is resistance set up by a complex*. This fact, which has not yet been refuted by any other observations, seems to me to contradict the above-mentioned formulæ. (For confirmation, see my "Psychology of Dementia Præcox," p. 103.) Psychoanalysis has proved conclusively that a resistance always has an intention and a meaning; that there is no such thing as a capricious playing with contrasts. The systematic character of resistance holds good, as I believe I have proved, even in schizophrenia. So long as this position, founded upon a great variety of experience, is not disproved by any other observations, the theory of negativism must adapt itself to it. Bleuler in a sense supports this when he says: "For the most part the negative reaction does not

simply appear as accidental, *but is actually preferred to the right one.*" This is an admission that negativism is of the nature of resistance. Once admit this, and the primary importance of ambivalency disappears so far as negativism is concerned. The tendency to resistance remains as the only fundamental principle. Ambivalency can in no sense be put on all fours with the "schizophrenic splitting of the psyche," but must be regarded as a concept which gives expression to the universal and ever-present inner association of pairs of opposites. (One of the most remarkable examples of this is the "contrary meaning of root-words." See Freud's "Essay on Dreams," Jahrbuch, vol. II., p. 179.) The same thing applies to ambivalence. Neither is specific of schizophrenia, but applies equally to the neuroses and the normal. All that is specific to katatonic negativism is *the intentional contrast, i.e. the resistance.* From this explanation we see that resistance is something different from ambivalency; it is the dynamic factor which makes manifest the everywhere latent ambivalency. What is characteristic of the diseased mind is not ambivalency but resistance. This implies the existence of a conflict between two opposite tendencies which has succeeded in raising the normally present ambivalency into a struggle of opposing components. (Freud has very aptly called this, "The separation of pairs of opposites.") In other words it is a conflict of wills, bringing about the neurotic condition of "disharmony within the self." This condition is the only "splitting of the psyche" known to us, and is not so much to be regarded as a predisposing cause, but rather as a manifestation resulting from the inner conflict—the "incompatibility of the complex" (Riklin).

Resistance, as the fundamental fact of schizophrenic dissociation, thus becomes something which, in contra-distinction to ambivalency, is not *eo ipso* identical with the concept of the state of feeling, but is a secondary and supplementary one, with its own special and *quasi* independent psychological development; and this is identical with the necessary previous history of the complex in every case. It follows that the theory of negativism coincides with the theory of the complex, as the complex is the cause of the resistance.

Bleuler summarises the causes of negativism as follows:

- (a) The autistic retirement of the patient into his own phantasies.
- (b) The existence of a life-wound (complex) which must be protected from injury.
- (c) The misconception of the environment and of its meaning.
- (d) The directly hostile relation to environment.
- (e) The pathological irritability of schizophrenics.
- (f) The "press of ideas," and other aggravations of action and thought.
- (g) Sexuality with its ambivalency on the emotional plane is often one of the roots of negative reaction.

(a) Autistic withdrawal into one's own phantasies^[170] is what I formerly designated as the obvious overgrowth of the phantasies of the complex. The strengthening of the complex is coincident with the increase of the resistance.

(b) The life-wound (*Lebenswund*) is the complex which, as a matter of course, is present in every case of schizophrenia, and of necessity always carries with it the phenomena of autism or auto-erotism (introversion), for complexes and involuntary egocentricity are inseparable reciprocities. Points (a) and (b) are therefore identical. (Cf. "Psychology of Dementia Præcox," chapters ii. and iii.)

(c) It is proved that the misconception of environment is an assimilation of the complex.

(d) The hostile relation to environment is the maximum of resistance as psychoanalysis clearly shows. (d) goes with (a).

(e) "Irritability" proves itself psychoanalytically to be one of the commonest results of the complex. I designated it *complex-sensibility*. Its generalised form (if one may use such an expression) manifests itself as a damming up of the affect (= damming of the *libido*), consequent on increased resistance. So-called neurasthenia is a classical example of this.

(f) Under the term "press of ideas," and similar intellectual troubles, may be classified the "want of clearness and logic of the schizophrenic thinking," which Bleuler considers a predisposing cause. I have, as I may presume is known, expressed myself with much reserve on what he regards as the premeditation of the schizophrenic adjustment. Further and wider experience has taught me that the laws of the Freudian psychology of dreams and the theory of the neuroses must be turned towards the obscurities of schizophrenic thinking. *The painfulness of the elaborated complex necessitates a censorship of its expression.*^[171] This principle has to be applied to schizophrenic disturbance in thinking; and until it has been proved that this principle is not applicable to schizophrenia, there is no justification for setting up a new principle; *i.e.* to postulate that schizophrenic disturbance of ideas is something primary. Investigations of hypnagogic activity, as well as association reactions in states of concentrated attention, give psychical results which up to now are indistinguishable from the mental conditions in schizophrenia. For example excessive relaxation of attention suffices to conjure up images as like as two peas to the phantasies and expressions of schizophrenia. It will be remembered that I have attributed the notorious disturbances of attention in schizophrenia to the special character of the complex; an idea which my experience since 1906 have further confirmed. There are good reasons for believing specific schizophrenic thought-disturbance to be the *result of a complex*.

Now as regards the symptoms of thought-pressure, it is first and foremost a thought-compulsion, which, as Freud has shown, is first a thought-complex and secondly a *sexualisation of the thought*. Then to the symptom of thought-pressure there is superadded at least a *demoniac* impulse such as *may be observed in every vigorous release or production of libido*.

Thought-pressure, on closer examination, is seen to be a result of schizophrenic introversion, which necessarily leads to a sexualisation of the thought; *i.e.* to an autonomy of the complex.
^[172]

(g) *The transition to sexuality* appears from the psychoanalytical standpoint difficult to understand. If we consider that the development of resistance coincides in every case with the history of the complex we must ask ourselves: Is the complex sexual or not? (It goes without saying that we must understand sexuality in its proper sense of psycho-sexuality.) To this

question psychoanalysis gives the invariable answer: *Resistance always springs from a peculiar sexual development*. The latter leads in the well-known manner to conflict, *i.e.* to the complex. Every case of schizophrenia which has so far been analysed confirms this. It can therefore claim at least to be a working hypothesis, and one to be followed up. In the present state of our knowledge, it is therefore not easy to see why Bleuler only allows to sexuality a *quasi-determining* influence on the phenomena of negativism; for psychoanalysis demonstrates that the cause of negativism is resistance; and that with schizophrenia, as with all other neuroses, this arises from the peculiar sexual development.

It can scarcely be doubted to-day that schizophrenia, with its preponderance of the mechanisms of introversion, possesses the same mechanism as any other "psycho-neurosis." In my opinion, at any rate, its peculiar symptoms (apart from the clinical and anatomical standpoints) are only to be studied by psychoanalysis, *i.e.* when the investigation is mainly directed to the genetic impetus. I have, therefore, endeavoured to indicate how Bleuler's hypothesis stands in the light of the theory of complexes; I feel myself bound to emphasise the complex-theory in this relation, and am not disposed to surrender this conception, which is as illuminating as it was difficult to evolve.

CHAPTER VII

PSYCHOANALYSIS^[173]

Psychoanalysis is not only scientific, but also technical in character; and from results technical in their nature, has been developed a new psychological science which might be called "analytical psychology."

Psychologists and doctors in general are by no means conversant with this particular branch of psychology, owing to the fact that its technical foundations are as yet comparatively unknown to them. Reason for this may be found in that the new method is exquisitely psychological, and therefore belongs neither to the realm of medicine nor to that of experimental psychology. The medical man has, as a rule, but little knowledge of psychology; and the psychologist has no medical knowledge. There is therefore a lack of suitable soil in which to plant the spirit of this new method. Furthermore, the method itself appears to many persons so arbitrary that they cannot reconcile it with their scientific conscience. The conceptions of Freud, the founder of this method, laid particular stress upon the sexual factor; this fact has aroused strong prejudice, and many scientific men are repelled merely by this feeling. I need hardly remark that such an antipathy is not a logical ground for rejecting a new method. The facts being so, it is obvious that the psychoanalyst should discuss the principles rather than the results of his method, when he speaks in public; for he who does not acknowledge the scientific character of the method cannot acknowledge the scientific character of its results.

Before I enter into the principles of the psychoanalytic method, I must mention two common prejudices against it.

The first of these is that psychoanalysis is nothing but a somewhat deep and complicated form of anamnesis. Now it is well known that the anamnesis is based upon the evidence supplied by the patient's family, and upon his own conscious self-knowledge, revealed in reply to direct questions. The psychoanalyst naturally develops his anamnestic data as carefully as any other specialist; but this is merely the patient's history, and must not be confused with analysis. Analysis is the reduction of an actual conscious content of a so-called accidental nature, into its psychological determinants. This process has nothing to do with the anamnestic reconstruction of the history of the illness.

The second prejudice, which is based, as a rule, upon a superficial knowledge of psychoanalytic literature, is that psychoanalysis is a method of suggestion, by which a faith or doctrine of living is imposed upon the patient, thereby effecting a cure in the manner of mental healing or Christian Science. Many analysts, especially those who have worked in psychoanalysis for a long time, previously used therapeutic suggestion, and are therefore familiar with its workings. They know that the psychoanalyst's method of working is diametrically opposed to that of the hypnotist. In direct contrast with therapeutic suggestion, the psychoanalyst does not attempt to force anything upon his patient which the latter does

not see himself, and find reasonable with his own understanding. Faced with the constant desire on the part of the neurotic patient to receive suggestions and advice, the analyst just as constantly endeavours to lead him away from this passive receptive attitude, and make him use his common sense and powers of criticism, that equipped with these he may become fitted to meet the problems of life independently. We have often been accused of forcing interpretations upon patients, interpretations that were frequently quite arbitrary in character. I wish that one of these critics would make the attempt to force such arbitrary interpretations upon my patients, who are often persons of great intelligence and high culture, and who are, indeed, not infrequently my own colleagues. The impossibility of such an undertaking would soon be laid bare. In psychoanalysis we are dependent upon the patient and his judgment, for the reason that the very nature of analysis consists in leading him to a knowledge of his own self. The principles of psychoanalysis are so entirely different from those of therapeutic suggestion that they are not comparable.

An attempt has also been made to compare analysis with the reasoning method of Dubois, which is in itself a rational process. This comparison does not however hold good, for the psychoanalyst strictly avoids argument and persuasion with his patients. He must naturally listen to and take note of the conscious problems and conflicts of his patient, but not for the purpose of fulfilling his desire to obtain advice or direction with regard to his conduct. The problems of a neurotic patient cannot be solved by advice and conscious argument. I do not doubt that good advice at the right time can produce good results; but I do not know whence one can obtain the belief that the psychoanalyst can always give the right advice at the right time. The neurotic conflict is frequently, indeed as a rule, of such a character that advice cannot possibly be given. Furthermore, it is well known that the patient only desires authoritative advice in order that he may cast aside the burden of responsibility, referring himself and others to the opinion of the higher authority.

In direct contrast to all previous methods, psychoanalysis endeavours to overcome the disorders of the neurotic psyche through the subconscious, not through the conscious self. In this work we naturally have need of the patient's conscious content, for his subconsciousness can only be reached *viâ* the conscious. The material furnished by the anamnesis is the source from which our work starts. The detailed recital usually furnishes many valuable clues which make the psychogenic origin of the symptoms clear to the patient. This work is naturally only necessary where the patient is convinced that his neurosis is organic in its origin. But even in those cases where the patient is convinced from the very first of the psychic nature of his illness, a critical survey of the history is very advantageous, since it discloses to him a psychological concatenation of ideas of which he was unaware. In this manner those problems which need special discussion are frequently brought to the surface. Work of this kind may occupy many sittings. Finally the explanation of the conscious material reaches an end, in so far as neither the patient nor the doctor can add anything to it that is decisive in character. Under the most favourable circumstances the end comes with the formulation of the problem which proved itself to be impossible of solution. Let us take, for instance, the case of a man who was once well, but who became a neurotic between the age of 35 and 40. His position in life is assured, and he has a wife and children. Parallel with his neurosis he developed an intense resistance towards his professional work. He observed that the first symptoms of neurosis became noticeable when he had to overcome a certain difficulty in regard to it. Later on his symptoms became aggravated with each successive difficulty that

arose. An amelioration in his neurosis occurred whenever fortune favoured him in his professional work. The problem that results from a critical discussion of the anamnesis is as follows:—

The patient is aware that if he could improve his work, the mere satisfaction that would result could bring about the much-desired improvement in his neurotic condition. He cannot, however, make his work more efficient because of his great resistance against it. This problem cannot be solved by any reasoning process.

Let us take another case. A woman of 40, the mother of four children, became neurotic four years ago after the death of one of her children. A new period of pregnancy, followed by the birth of another child, produced a great improvement in her condition. The patient now lived in the thought that it would be a great help to her if she could have yet another child. Believing, however, that this could not happen, she attempted to devote her energies to philanthropic interests. But she failed to obtain the least satisfaction from this work. She observed a distinct alleviation of her complaint whenever she succeeded in giving real, living interest to any matter, but she felt entirely incapable of discovering anything that could bring her lasting interest and satisfaction. It is clear that no process of reasoning can solve this problem.

Here psychoanalysis must begin with the endeavour to solve the problem as to what prevents the patient from developing interests above and beyond her longing for a child.

Since we cannot assume that we know from the very beginning what the solution of such problems is, we must at this point trust to the clues furnished us by the individuality of the patient. Neither conscious questioning nor rational advice can aid us in the discovery of these clues, for the causes which prevent us from finding them are hidden from her consciousness. There is, therefore, no clearly indicated path by which to reach these subconscious inhibitions. The only rule that psychoanalysis lays down for our guidance in this respect, is to let the patient speak of that which occurs to him at the moment. The analyst must observe carefully what the patient says and, in the first instance, take due note thereof without attempting to force his own opinions upon him. Thus we observe that the patient whom I first mentioned begins by talking about his marriage, which we hitherto had reason to regard as normal. We now learn that he constantly has difficulties with his wife, and that he does not understand her in the least. This knowledge causes the physician to remark that the patient's professional work is clearly not his only problem; but that his conjugal relations are also in need of revision. This starts a train of thought in which many further ideas occur to the patient, concerning his married life. Hereupon follow ideas about the love affairs he had before his marriage. These experiences, related in detail, show that the patient was always somewhat peculiar in his more intimate relations with women, and that this peculiarity took the form of a certain childish egoism. This is a new and surprising point of view for him, and explains to him many of his misfortunes with women.

We cannot in every case get so far as this on the simple principle of letting the patient talk; few patients have their psychic material so much on the surface. Furthermore, many persons have a positive resistance against speaking freely about what occurs to them on the spur of the moment; it is often too painful to tell the doctor whom perhaps they do not entirely trust; in other cases because apparently nothing occurs to them, they force themselves to speak of

matters about which they are more or less indifferent. This habit of not talking to the point by no means proves that patients consciously conceal their unpleasant contents, for such irrelevant speaking can occur quite unconsciously. In such cases it sometimes helps the patient if he is told that he must not force himself, that he must only seize upon the very first thoughts that present themselves, no matter how unimportant or ridiculous they may seem. In certain cases even these instructions are of no use, and then the doctor is obliged to have recourse to other expedients. One of these is the employment of the association test, which usually gives excellent information as to the chief momentary tendencies of the individual.

A second expedient is dream analysis; this is *the real instrument* of psychoanalysis. We have already experienced so much opposition to dream analysis that a brief exposition of its principles is necessary. The interpretation of dreams, as well as the meaning given to them, is, as we know, in bad odour. It is not long since that oneirocritics were practised and believed in; nor is the time long past when even the most enlightened human beings were entirely under the ban of superstition. It is therefore comprehensible that our age should still retain a certain lively fear of those superstitions which have but recently been partially overcome. To this timidity in regard to superstition, the opposition to dream analysis is in a large measure due; but analysis is in no wise to blame for this. We do not select the dream as our object because we pay it the homage of superstitious admiration, but because it is a psychic product that is independent of the patient's consciousness. We ask for the patient's free thoughts, but he gives us little, or nothing; or at best something forced or irrelevant. Dreams are free thoughts, free phantasies, they are not forced, and they are psychic phenomena just as much as thoughts are.

It may be said of the dream that it enters into the consciousness as a complex structure, the connection between the elements of which is not conscious. Only by afterwards joining associations to the separate pictures of the dream, can the origin of these pictures, in certain recollections of the near and more remote past, be proved. One asks oneself: "Where have I seen or heard that?" And by the same process of free association comes the memory that one has actually experienced certain parts of the dream, some of them yesterday, some at an earlier date. This is well known, and every one will probably agree to it. Thus far the dream presents itself, as a rule, as an incomprehensible composition of certain elements which are not in the first instance conscious, but which are later recognised by the process of free association. This might be disputed on the ground that it is an *a priori* statement. I must remark, however, that this conception conforms to the only generally recognised working hypothesis as to the genesis of dreams, namely, the derivation of the dream from experiences and thoughts of the recent past. We are, therefore, upon known ground. Not that certain dream parts have under all circumstances been known to the individual, so that one might ascribe to them the character of being conscious; on the contrary, they are frequently, even generally, unrecognisable. Not until later do we

remember having consciously experienced this or that dream part. We may therefore regard the dream from this point of view as a product that comes from a subconscious origin. The technical unfolding of these subconscious sources is a mode of procedure that has always been instinctively employed. One simply tries to remember whence the dream parts come. Upon this most simple principle the psychoanalytic method of solving dreams is based. It is a fact that certain dream parts are derived from our waking life and, indeed, from experiences which, owing to their notorious lack of importance, would frequently have been consigned to certain oblivion, and were therefore well on their way towards becoming definitely subconscious. Such dream parts are the results of subconscious representations (images).

The principles according to which psychoanalysis solves dreams are therefore exceedingly simple, and have really been known for a long time. The further procedure follows the same path logically and consistently. If one spends considerable time over a dream, which really never happens outside psychoanalysis, one can succeed in finding more and more recollections for the separate dream parts. It is, however, not always possible to discover recollections for certain other parts; and then one must leave them for the time being, whether one likes it or not. When I speak of "recollections" I naturally do not mean merely memories of certain concrete experiences, but also of their inter-related meanings. The collected recollections are known as the dream material. With this material one proceeds according to a scientific method that is universally valid. If one has any experimental material to work up, one compares its separate parts and arranges them according to their similarities. Exactly the same course is pursued in dealing with the dream material; one gathers together its common characteristics, whether these be formal or material. In doing this one must absolutely get rid of certain prejudices. I have always observed that the beginner expects to find some tendency or other according to which he endeavours to mould his material. I have noticed this particularly in the cases of colleagues who were previously more or less violent opponents of psychoanalysis, owing to their well-known prejudices and misunderstandings. When fate willed that I should analyse them, and they consequently gained at last an insight into the method of analysis, it was demonstrated that the first mistake which they had been apt to make in their own psychoanalytic practice was that they forced the material into accord

with their own preconceived opinions; that is, they allowed their former attitude towards psychoanalysis, which they were not able to appreciate objectively, but only according to subjective phantasies, to have its influence upon their material. If one goes so far as to venture upon the task of examining the dream material, one must permit no comparison to frighten one away. The material consists, as a general rule, of very unequal images, from which it is under some circumstances most difficult to obtain the "tertium comparationis." I must forego giving you detailed examples of this, since it is quite impossible to introduce such extensive material into a lecture.

One pursues, then, the same method in classifying the unconscious content, as is used everywhere in comparing materials for the purpose of drawing conclusions from them. One objection has often been made, namely: why should the dream have a subconscious content at all? This objection is unscientific in my opinion. Every psychological moment has its own history. Every sentence that I utter has, besides the meaning consciously intended by me, a meaning that is historical; and this last may be entirely different from the conscious meaning. I am purposely expressing myself somewhat paradoxically. I certainly should not take it upon myself to explain each sentence according to its individual-historical meaning. That is easier in the case of larger and more complex formations. Every one is certainly convinced of the fact that a poem—in addition to its manifest contents—is also particularly characteristic of its author, in its form, subject-matter, and the history of its origin. Whereas the poet gave skilful expression to a fleeting mood in his song, the historian of literature sees in it and beyond it, things which the poet would never have suspected. The analysis which the literary critic makes of the subject-matter furnished by the poet may be compared with psychoanalysis in its method, even to the very errors which occur therein. The psychoanalytic method may be aptly compared with historical analysis and synthesis. Let us assume, for instance, that we do not understand the meaning of the rite of baptism as it is practised in our churches to-day. The priest tells us that baptism means the reception of the child into the Christian community. But we are not satisfied with this. Why should the child be sprinkled with water, etc.? In order that we may understand this rite we must gather together materials for comparison from the history of the rite, that is, from the memories of

mankind appertaining to it; and this must be done from various points of view.

Firstly—Baptism is clearly a rite of initiation, a consecration. Therefore those memories, above all, must be assembled which preserve the rites of initiation.

Secondly—The act of baptism is performed with water. This especial form of procedure proves the necessity of welding together another chain of memories concerning rites in which water was used.

Thirdly—The child is sprinkled with water when it is christened. In this case we must gather together all the forms of the rite, where the neophyte is sprinkled or where the child is submerged, etc.

Fourthly—We must recollect all the reminiscences in mythology and all the superstitious customs which are in any respect similar to the symbolic act of baptism.

In this manner we obtain a comparative study of the act of baptism. Thus we ascertain the elements from which baptism is derived; we further ascertain its original meaning, and at the same time make the acquaintance of a world rich in religious mythology, which makes clear to us all the multifarious and derived meanings of the act of baptism. Thus the analyst deals with the dream. He gathers together historical parallels for each dream part, even though they be very remote and attempts to construct the psychological history of the dream and the meanings that underlie it. By this monographic elaboration of the dream one gains, exactly as in the analysis of the act of baptism, a deep insight into the wonderfully subtle and significant network of subconscious determinations; an insight which, as I have said, can only be compared with the historical understanding of an act that we used only to consider from a very one-sided and superficial point of view.

I cannot disguise the fact that in practice, especially at the beginning of an analysis, we do not in all cases make complete and ideal analyses of dreams, but that we more generally continue to gather together the dream associations until the problem which the patient hides from us becomes so clear that even he can recognize it. This problem is then subjected to

conscious elaboration until it is cleared up as far as possible, and once again we stand before a question that cannot be answered.

You will now ask what course is to be pursued when the patient does not dream at all; I can assure you that hitherto all patients, even those who claimed never to have dreamed before, began to dream when they went through analysis. But on the other hand it frequently occurs that patients who began by dreaming vividly are suddenly no longer able to remember their dreams. The empirical and practical rule, which I have hitherto regarded as binding, is that the patient, if he does not dream, has sufficient conscious material, which he keeps back for certain reasons. A common reason is: "I am in the doctor's hands and am quite willing to be treated by him. But the doctor must do the work, I shall remain passive in the matter."

Sometimes the resistances are of a more serious character. For instance, persons who cannot admit certain morally grave sides to their characters, project their deficiencies upon the doctor by calmly presuming that he is more or less deficient morally, and that for this reason they cannot communicate certain unpleasant things to him. If, then a patient does not dream from the beginning or ceases to dream he retains material which is susceptible of conscious elaboration. Here the personal relation between the doctor and his patient may be regarded as the chief hindrance. It can prevent them both, the doctor as well as the patient, from seeing the situation clearly. We must not forget that, as the doctor shows, and must show, a searching interest in the psychology of his patient, so, too, the patient, if he has an active mind, gains some familiarity with the psychology of the doctor and assumes a corresponding attitude towards him. Thus the doctor is blind to the mental attitude of the patient to the exact extent that he does not see himself and his own subconscious problems. Therefore I maintain that a doctor must be analysed before he practises analysis. Otherwise the practice of analysis can easily be a great disappointment to him, because he can, under certain circumstances, reach a point where further progress is impossible, a situation which may make him lose his head. He is then readily inclined to assume that psychoanalysis is nonsense, so as to avoid the admission that he has run his vessel ashore. If you are sure of your own psychology you can confidently tell your patient that he does not dream because there is still conscious material to be disposed of. I say that one must be sure of one's self in such cases, for the

opinions and unsparing criticisms to which one sometimes has to submit, can be excessively disturbing to one who is unprepared to meet them. The immediate consequence of such a loss of personal balance on the part of the doctor is that he begins to argue with his patient, in order to maintain his influence over him; and this, of course, renders all further analysis impossible.

I have told you that, in the first instance, dreams need only be used as sources of material for analysis. At the beginning of an analysis it is not only unnecessary, but also unwise, to make a so-called complete interpretation of a dream; for it is very difficult indeed to make a complete and really exhaustive interpretation. The interpretations of dreams that one sometimes reads in psychoanalytic publications are often one-sided, and not infrequently contestable formulations. I include among these certain one-sided sexual reductions of the Viennese school. In view of the comprehensive many-sidedness of the dream material one must beware, above all, of one-sided formulations. The many-sidedness of the meaning of a dream, not its singleness of meaning, is of the utmost value, especially at the beginning of the psychoanalytic treatment. Thus, for instance, a patient had the following dream not long after her treatment had begun: "*She was in a hotel in a strange city. Suddenly a fire broke out; and her husband and her father, who were with her, helped her in the work of saving others.*" The patient was intelligent, extraordinarily sceptical, and absolutely convinced that dream analysis was nonsense. I had difficulty in inducing her to give dream analysis even one trial. Indeed I saw at once that I could not inform my patient of the real content of the dream under these circumstances because her resistances were much too great. I selected the fire, the most conspicuous occurrence of the dream, as the starting point for obtaining her free associations. The patient told me that she had recently read in a newspaper that a certain hotel in Z. had been burnt down; that she remembered the hotel because she had once lived in it. At the hotel she had made the acquaintance of a man, and from this acquaintance a somewhat questionable love affair developed. In connection with this story the fact came out that she had already had quite a number of similar adventures, all of which had a certain frivolous character. This important bit of past history was brought out by the first free association with a dream-part. It would have been impossible in this case to make clear to the patient the very striking meaning of the dream. With her frivolous mental attitude, of which

her scepticism was only a special instance, she could have calmly repelled any attempt of this kind. But after the frivolity of her mental attitude was recognised and proved to her, by the material that she herself had furnished, it was possible to analyse the dreams which followed much more thoroughly.

It is, therefore, advisable in the beginning to make use of dreams for the purpose of reaching the important subconscious material by means of the patient's free associations in connection with them. This is the best and most cautious method, especially for those who are just beginning to practise analysis. An arbitrary translation of the dreams is absolutely inadvisable. That would be a superstitious practice based on the acceptance of well-established symbolic meanings. But there are no fixed symbolic meanings. There are certain symbols that recur frequently, but we are not able to get beyond general statements. For instance, it is quite incorrect to assume that the snake, when it appears in dreams, has a merely phallic meaning; just as incorrect as it is to deny that it may have a phallic meaning in some cases. Every symbol has more than one meaning. I can therefore not admit the correctness of exclusively sexual interpretations, such as appear in some psychoanalytic publications, for my experience has made me regard them as one-sided and therefore insufficient. As an example of this I will tell you a very simple dream of a young patient of mine. It was as follows: *"I was going up a flight of stairs with my mother and sister. When we reached the top I was told that my sister was soon to have a child."*

I shall now show you how, on the strength of the hitherto prevailing point of view, this dream may be translated so that it receives a sexual meaning. We know that the incest phantasy plays a prominent part in the life of a neurotic. Hence the picture "with my mother and sister" might be regarded as an allusion in this direction. The "stairs" have a sexual meaning that is supposedly well established; they represent the sexual act because of the rhythmic climbing of steps. The child that my patient's sister is expecting is nothing but the logical result of these premises. The dream, translated thus, would be a clear fulfilment of infantile desires which as we know play an important part in Freud's theory of dreams.

Now I have analysed this with the aid of the following process of reasoning: If I say that the stairs are a symbol for the sexual act, whence do I obtain the right to regard the mother, the sister, and the child as concrete; that is, as not

symbolic? If, on the strength of the claim that dream pictures are symbolic, I give to certain of these pictures the value of symbols, what right have I to exempt certain other dream parts from this process? If, therefore, I attach symbolic value to the ascent of the stairs, I must also attach a symbolic value to the pictures that represent the mother, the sister, and the child. Therefore I did not translate the dream, but really analysed it. The result was surprising. I will give you the free associations with the separate dream-parts, word for word, so that you can form your own opinions concerning the material. I should state in advance that the young man had finished his studies at the university a few months previously; that he found the choice of a profession too difficult to make; and that he thereupon became a neurotic. In consequence of this he gave up his work. His neurosis took, among other things, a decidedly homosexual form.

The patient's associations with his mother are as follows: "I have not seen her for a long time, a very long time. I really ought to reproach myself for this. It is wrong of me to neglect her so." "Mother," then, stands here for something which is neglected in an inexcusable manner. I said to the patient: "What is that?" And he replied, with considerable embarrassment, "My work."

With his sister he associated as follows: "It is years since I have seen her. I long to see her again. Whenever I think of her I recall the time when I took leave of her. I kissed her with real affection; and at that moment I understood for the first time what love for a woman can mean." It is at once clear to the patient that his sister represents "love for woman."

With the stairs he has this association: "Climbing upwards; getting to the top; making a success of life; being grown up; being great." The child brings him the ideas: "New born; a revival; a regeneration; to become a new man."

One only has to hear this material in order to understand at once that the patient's dream is not so much the fulfilment of infantile desires, as it is the expression of biological duties which he has hitherto neglected because of his infantilism. Biological justice, which is inexorable, sometimes compels the human being to atone in his dreams for the duties which he has neglected in real life.

This dream is a typical example of the prospective and teleological function of dreams in general, a function that has been especially emphasised by my colleague Dr. Maeder. If we adhered to the one-sidedness of sexual interpretation, the real meaning of the dream would escape us. Sexuality in dreams is, in the first instance, a means of expression, and by no means always the meaning and the object of the dream. The unfolding of the prospective or teleological meaning of dreams is of particular importance as soon as analysis is so far advanced that the eyes of the patient are more easily turned upon the future, than upon his inner life and upon the past.

In connection with the application of symbolism, we can also learn from the example furnished us by this dream, that there can be no fixed and unalterable dream symbols, but at best a frequent repetition of fairly general meanings. So far as the so-called sexual meaning of dreams, in particular, is concerned, my experience has led me to lay down the following practical rules:

If dream analysis at the beginning of the treatment shows that the dream has an undoubted sexual meaning, this meaning is to be taken realistically; that is, it is proved thereby that the sexual problem itself must be subjected to a careful revision. If, for instance, an incest phantasy is clearly shown to be a latent content of the dream, one must subject the patient's infantile relations towards his parents and his brothers and sisters, as well as his relations towards other persons who are fitted to play the part of his father or mother in his mind, to a careful examination on this basis. But if a dream that comes in a later stage of the analysis has, let us say, an incest phantasy as its essential content, a phantasy that we have reason to consider disposed of, concrete value must not be attached to it under all circumstances; it must be regarded as symbolic. In this case symbolic value, not concrete value, must be attached to the sexual phantasy. If we did not go beyond the concrete value in this case, we should keep reducing the patient to sexuality, and this would arrest the progress of the development of his personality. The patient's salvation is not to be found by thrusting him back again into primitive sexuality; this would leave him on a low plane of civilisation whence he could never obtain freedom and complete restoration to health. Retrogression to a state of barbarism is no advantage at all for a civilised human being.

The above-mentioned formula, according to which the sexuality of a dream is a symbolic or analogous expression, naturally also holds good in the case of dreams occurring in the beginning of an analysis. But the practical reasons that have induced us not to take into consideration the symbolic value of this sexual phantasy, owe their existence to the fact that a genuine realistic value must be given to the abnormal sexual phantasies of a neurotic, in so far as the latter suffers himself to be influenced in his actions by these phantasies. Experience teaches us that these phantasies not only hinder him from adapting himself suitably to his situation, but that they also lead him to all manner of really sexual acts, and occasionally even to incest. Under these circumstances, it would be of little use to consider the symbolic content of the dream only; the concrete content must first be disposed of.

These arguments are based upon a different conception of the dream from that put forward by Freud; for, indeed, my experience has forced me to a different conception. According to Freud, the dream is in its essence a symbolic veil for repressed desires which are in conflict with the ideals of the personality. I am obliged to regard the dream structure from a different point of view. The dream for me is, in the first instance, the subliminal picture of the psychological condition of the individual in his waking state. It presents a *résumé* of the subliminal association material which is brought together by the momentary psychological situation. The volitional meaning of the dream which Freud calls the repressed desire, is, for me, essentially a means of expression. The activity of the consciousness, speaking biologically, represents the psychological effort which the individual makes in adapting himself to the conditions of life. His consciousness endeavours to adjust itself to the necessities of the moment, or, to put it differently: there are tasks ahead of the individual, which he must overcome. In many cases the solution is unknown; and for this reason the consciousness always tries to find the solution by the way of analogous experience. We always try to grasp what is unknown and in the future, according to our mental understanding of what has gone before. Now we have no reasons for assuming that the unconscious follows other laws than those which apply to conscious thought. The unconscious, like the conscious, gathers itself about the biological problems and endeavours to find solutions for these by analogy with what has gone before, just as much as the conscious does. Whenever we wish to assimilate something that is unknown, we arrive at it by a process of comparison. A simple example of this is the well-known

fact that, when America was discovered by the Spaniards, the Indians took the horses of the conquerors, which were strange to them, for large pigs, because pigs were familiar to their experience. This is the mental process which we always employ in recognising unknown things; and this is the essential reason for the existence of symbolism. It is a process of comprehension by means of analogy. The apparently repressed desires, contained in the dream, are volitional tendencies which serve as language-material for subconscious expression. So far as this particular point is concerned, I am in full accord with the views of Adler, another member of Freud's school. With reference to the fact that subconscious materials of expression are volitional elements or tendencies, I may say that this is dependent upon the archaic nature of dream thinking, a problem with which I have already dealt in previous researches.^[174]

Owing to our different conception of the structure of the dream, the further course of analysis also gains a different complexion from that which it had until now. The symbolic valuation given to sexual phantasies in the later stages of analysis necessarily leads less to the reduction of the patient's personality into primitive tendencies, than to the extension and further development of his mental attitude; that is, it tends to make his thinking richer and deeper, thus giving him what has always been one of the most powerful weapons that a human being can have in his struggle to adapt himself to life. By following this new course logically, I have come to the conclusion that these religious and philosophical motive forces—the so-called metaphysical needs of the human being—must receive positive consideration at the hands of the analyst. Though he must not destroy the motive forces that underlie them, by reducing them to their primitive, sexual roots, he must make them serve biological ends as psychologically valuable factors. Thus these instincts assume once more those functions that have been theirs from time immemorial.

Just as primitive man was able, with the aid of religious and philosophical symbol, to free himself from his original state, so, too, the neurotic can shake off his illness in a similar way. It is hardly necessary for me to say, that I do not mean by this, that the belief in a religious or philosophical dogma should be thrust upon the patient; I mean simply that he has to reassume that psychological attitude which, in an earlier civilisation, was characterised by the living belief in a religious or philosophical dogma. But

the religious-philosophical attitude does not necessarily correspond to the belief in a dogma. A dogma is a transitory intellectual formulation; it is the result of the religious-philosophical attitude, and is dependent upon time and circumstances. This attitude is itself an achievement of civilization; it is a function that is exceedingly valuable from a biological point of view, for it gives rise to the incentives that force human beings to do creative work for the benefit of a future age, and, if necessary, to sacrifice themselves for the welfare of the species.

Thus the human being attains the same sense of unity and totality, the same confidence, the same capacity for self-sacrifice in his conscious existence that belongs unconsciously and instinctively to wild animals. Every reduction, every digression from the course that has been laid down for the development of civilisation does nothing more than turn the human being into a crippled animal; it never makes a so-called natural man of him. My numerous successes and failures in the course of my analytic practice have convinced me of the invariable correctness of this psychological orientation. We do not help the neurotic patient by freeing him from the demand made by civilisation; we can only help him by inducing him to take an active part in the strenuous task of carrying on the development of civilisation. The suffering which he undergoes in performing this duty takes the place of his neurosis. But, whereas the neurosis and the complaints that accompany it are never followed by the delicious feeling of good work well done, of duty fearlessly performed, the suffering that comes from useful work, and from victory over real difficulties, brings with it those moments of peace and satisfaction which give the human being the priceless feeling that he has really lived his life.

CHAPTER VIII

ON PSYCHOANALYSIS^[175]

After many years' experience I now know that it is extremely difficult to discuss psychoanalysis at public meetings and at congresses. There are so many misconceptions of the matter, so many prejudices against certain psychoanalytic views, that it becomes an almost impossible task to reach mutual understanding in public discussion. I have always found a quiet conversation on the subject much more useful and fruitful than heated discussions *coram publico*. However, having been honoured by an invitation from the Committee of this Congress as a representative of the psychoanalytic movement, I will do my best to discuss some of the fundamental theoretical conceptions of psychoanalysis. I must limit myself to this part of the subject because I am quite unable to place before my audience all that psychoanalysis means and strives for, all its various applications, its psychology, its theoretical tendencies, its importance for the realm of the so-called "Geisteswissenschaften," e.g. Mythology, Comparative Religion, Philosophy, &c. But if I am to discuss certain theoretical problems fundamental to psychoanalysis, I must presuppose my audience to be well acquainted with the development and main results of psychoanalytic researches. Unfortunately, it often happens that people believe themselves entitled to judge psychoanalysis who have not even read the literature. It is my firm conviction that no one is competent to form a judgment concerning the subject until he has studied the fundamental works on psychoanalysis.

In spite of the fact that Freud's theory of neurosis has been worked out in great detail, it cannot be said to be, on the whole, very clear or easily accessible. This justifies my giving you a very short abstract of his fundamental views concerning the theory of neurosis.

You are aware that the original theory that hysteria and the related neuroses take their origin in a trauma or shock of sexual character in early childhood, was given up about fifteen years ago. It soon became obvious that the

sexual trauma could not be the real cause of a neurosis, since trauma is found so universally; there is scarcely a human being who has not had some sexual shock in early youth, and yet comparatively few have incurred a neurosis in later life. Freud himself soon became aware that several of the patients who related an early traumatic event, had only invented the story of a so-called trauma; it had never taken place in reality, and was a mere creation of phantasy. Moreover, on further investigation it became quite obvious that even a trauma which had actually occurred was not always responsible for the whole of the neurosis, although it does sometimes look as if the structure of the neurosis depended entirely upon the trauma. If a neurosis were the inevitable consequence of a trauma it would be quite incomprehensible why neurotics are not incomparably more numerous.

This apparently heightened shock-effect was clearly based upon the *exaggerated and morbid phantasy* of the patient. Freud also saw that this same phantasy manifested itself in relatively early bad habits, which he called infantile perversities. His new conception of the ætiology of a neurosis was based upon this further understanding and traced the neurosis back to some sexual activity in early infancy; this conception led on to his recent view that the neurotic is "fixed" to a certain period of his early infancy, because he still seems to preserve some trace of it, direct or indirect, in his mental attitude. Freud also makes the attempt to classify or to differentiate the neuroses, including dementia præcox, according to the stage of the infantile development in which the fixation took place.

From the standpoint of this theory, the neurotic appears to be entirely dependent upon his infantile past, and all his troubles in later life, his moral conflicts, and deficiencies, seem to be derived from the powerful influence of that period. The therapy and its main preoccupation are in full accord with this view, and are chiefly concerned with the unravelling of this infantile fixation, which is understood as an unconscious attachment of the sexual libido to certain infantile phantasies and habits.

This is, so far as I can see, the essence of Freud's theory. But this conception neglects the following important question: What is the cause of this fixation of the libido to the old infantile phantasies and habits? We have to remember that almost all persons have at some time had infantile phantasies and habits exactly corresponding to those of a neurotic, but they do not become fixed to them; consequently, they do not become neurotic

later on. The ætiological secret of the neurosis, therefore, does not consist in the mere *existence* of infantile phantasies, but lies in the so-called *fixation*. The manifold statements of the existence of infantile sexual phantasies in neurotic cases are worthless, in so far as they attribute an ætiological value to them, for the same phantasies can be found in normal individuals as well, a fact which I have often proved. It is only the fixation which seems to be characteristic. It is important to demand the nature of the proofs of the real existence of this infantile fixation. Freud, an absolutely sincere and thorough empiricist, would never have evolved this hypothesis had he not had sufficient grounds for it. The grounds are found in the results of the psychoanalytic investigations of the unconscious. Psychoanalysis discloses the unconscious existence of manifold phantasies, which have their end root in the infantile past and turn around the so-called "*Kern-complex*," or nucleus-complex, which may be designated in male individuals as the Œdipus-complex and in females as the Electra-complex. These terms convey their own meaning exactly. The whole tragic fate of Œdipus and Electra took place within the narrow confines of the family, just as the child's fate lies wholly within the family boundaries. Hence the Œdipus conflict is very characteristic of an infantile conflict, so also is the Electra conflict. The existence of these conflicts in infancy is largely proven by means of psychoanalytic experience. It is in the realm of this complex that the fixation is supposed to have taken place. Through the highly potent and effective existence of the nucleus-complex in the unconscious of neurotics, Freud was led to the hypothesis, that the neurotic has a peculiar fixation or attachment to it. Not the mere existence of this complex—for everybody has it in the unconscious—but the very strong attachment to it is what is typical of the neurotic. He is far more influenced by this complex than the normal person; many examples in confirmation of this statement will be found in every one of the recent psychoanalytic histories of neurotic cases.

We must admit that this conception is a very plausible one, because the hypothesis of fixation is based upon the well-known fact, that certain periods of human life, and particularly infancy, do sometimes leave determining traces for ever. The only question is whether this principle is a sufficient explanation or not. If we examine persons who have been neurotic from infancy it seems to be confirmed, for we see the nucleus-complex as a permanent and powerful activity throughout the whole life. But if we take cases which never show any considerable traces of neurosis

except at the particular time when they break down, and there are many such, this principle becomes doubtful. If there is such a thing as fixation, it is not permissible to base upon it a new hypothesis, claiming that at times during certain epochs of life the fixation becomes loosened and ineffective, while at others it suddenly becomes strengthened and effective. In such cases we find the nucleus-complex as active and as potent as in those which apparently support the theory of fixation. Here a critical attitude is peculiarly justifiable, when we consider the often-repeated observation that the moment of the outbreak of the disease is by no means indifferent; as a rule it is most critical. It usually occurs *at the moment when a new psychological adjustment, that is, a new adaptation, is demanded*. Such moments facilitate the outbreak of a neurosis, as every experienced neurologist knows. This fact seems to me extremely significant. If the fixation were indeed real we should expect to find its influence constant, *i.e.* a neurosis continuous throughout life. This is obviously not the case. The psychological determination of a neurosis is only partially due to an early infantile predisposition; it is due to a certain actual cause as well. And if we carefully examine the kind of infantile phantasies and events to which the neurotic individual is attached, we shall be obliged to agree that there is nothing in them specific for neurosis. Normal individuals have pretty much the same kind of internal and external experiences, and are attached to them to an even astonishing degree, without developing a neurosis. You will find primitive people, especially, very much bound to their infantility. It now begins to look as if this so-called fixation were a normal phenomenon, and that the importance of infancy for the later mental attitude is natural and prevails everywhere. The fact that the neurotic seems to be markedly influenced by his infantile conflicts, shows that it is less a matter of fixation than of a peculiar use which he makes of his infantile past. It looks as if he exaggerated its importance, and attributed a very great artificial value to it (Adler, a pupil of Freud's, expresses a very similar view). It would be unjust to say that Freud confined himself to the hypothesis of fixation; he also was conscious of the impression I have just discussed. He called this phenomenon of reactivation or secondary exaggeration of infantile reminiscences "regression." But in Freud's conception it appears as if the incestuous desires of the Oedipus-complex were the real cause of the regression to infantile phantasies. If this were the case, we should have to postulate an unexpected intensity of the primary incestuous tendencies. This

view led Freud to his recent comparison between the so-called psychological "incest-barrier" in children and the "incest-taboo" in primitive man. He supposes that a real incestuous desire has led the primitive man to the invention of a protective law; while to me it looks as if the incest-taboo is one among numerous taboos of all sorts, and due to the typical superstitious fear of primitive man, a fear existing independently of incest and its interdiction. I am able to attribute as little particular strength to incestuous desires in childhood as in primitive humanity. I do not even seek the reason for regression in primary incestuous or any other sexual desires. I must state that a purely sexual ætiology of neurosis seems to me much too narrow. I base this criticism upon no prejudice against sexuality, but upon an intimate acquaintance with the whole problem.

Therefore I suggest that the psychoanalytic theory should be liberated from the purely sexual standpoint. In place of it I should like to introduce an *energetic view-point* into the psychology of neurosis.

All psychological phenomena can be considered as manifestations of energy, in the same way as all physical phenomena are already understood as energetic manifestations since Robert Mayer discovered the law of the conservation of energy. This energy is subjectively and psychologically conceived as *desire*. I call it *libido*, using the word in the original meaning of this term, which is by no means only sexual. Sallustius applies the term exactly in the way we do here: "*Magis in armis et militaribus equis, quam in scortis et conviviis libidinem habebant.*"

From a broader standpoint libido can be understood as vital energy in general, or as Bergson's *élan vital*. The first manifestation of this energy in the suckling is the instinct of *nutrition*. From this stage the libido slowly develops through manifold varieties of the act of sucking into the sexual function. Hence I do not consider the act of sucking as a sexual act. The pleasure in sucking can certainly not be considered as sexual pleasure, but as pleasure in nutrition, for it is nowhere proved that pleasure is sexual in itself. This process of development continues into adult life and is connected with a constantly increased adaptation to the external world. Whenever the libido, in the process of adaptation, meets an obstacle, an accumulation takes place which normally gives rise to an increased effort to overcome the obstacle. But if the obstacle seems to be insurmountable, and the individual renounces the overcoming of it, the stored-up libido makes a

regression. In place of being employed in the increased effort, the libido now gives up the present task and returns to a former and more primitive way of adaptation. We meet with the best examples of such regressions very frequently in hysterical cases where a disappointment in love or marriage gives rise to the neurosis. There we find the well-known disturbances of nutrition, resistance against eating, dyspeptic symptoms of all sorts, etc. In these cases the regressive libido, turning away from its application to the work of adaptation, holds sway over the function of nutrition and provokes considerable disturbance. Such cases are obvious examples of regression. Similar effects of regression are to be found in cases where there are no troubles in the function of nutrition, and here we readily find a regressive revival of reminiscences of a time long past. We find a revival of the images of the parents, of the Œdipus-complex. Here things and events of infancy—never before important—suddenly become so. They are regressively reanimated. Take away the obstacle in the path of life and this whole system of infantile phantasies at once breaks down and becomes again as inactive and as ineffective as before. But do not let us forget that, to a certain extent, it is at work influencing us always and everywhere. I cannot forbear to mention that this view comes very near Janet's hypothesis of the substitution of the "parties supérieures" of a function by its "parties inférieures." I would also remind you of Claparède's conception of neurotic symptoms as emotional reflexes of a primitive nature.

Therefore I no longer find the cause of a neurosis in the past, but in the present. I ask, what is the necessary task which the patient will not accomplish? The whole list of his infantile phantasies does not give me any sufficient ætiological explanation, because I know that these phantasies are only puffed up by the regressive libido, which has not found its natural outlet into a new form of adjustment to the demands of life.

You may ask why the neurotic has a special inclination not to accomplish his necessary tasks. Here let me point out that no living being adjusts itself easily and smoothly to new conditions. The principle of the *minimum of effort* is valid everywhere.

A sensitive and somewhat inharmonious character, as a neurotic always is, will meet special difficulties and perhaps more unusual tasks in life than a normal individual, who as a rule has only to follow the well-established line of an ordinary life. For the neurotic there is no established way, for his aims

and tasks are apt to be of a highly individual character. He tries to follow the more or less uncontrolled and half-conscious way of normal people, not fully realizing his own critical and very different nature, which imposes upon him more effort than the normal person is required to exert. There are neurotics who have shown their increased sensitiveness and their resistance against adaptation in the very first weeks of life, in their difficulty in taking the mother's breast, and in their exaggerated nervous reactions, &c. For this portion of a neurotic predisposition it will always be impossible to find a psychological ætiology, for it is anterior to all psychology. But this predisposition—you may call it "congenital sensitiveness" or by what name you like—is the cause of the first resistances against adaptation. In such case, the way of adaptation being blocked, the biological energy we call libido does not find its appropriate outlet or activity and therefore replaces an up-to-date and suitable form of adaptation by an abnormal or primitive one.

In neurosis we speak of an infantile attitude or the predominance of infantile phantasies and desires. In so far as infantile impressions and desires are of obvious importance in normal people they are equally influential in neurosis, but they have here no ætiological significance, they are reactions merely, being chiefly secondary and regressive phenomena. It is perfectly true, as Freud states, that infantile phantasies determine the form and further development of neurosis, but this is not ætiology. Even when we find perverted sexual phantasies of which we can prove the existence in childhood, we cannot consider them of ætiological significance. A neurosis is not really originated by infantile sexual phantasies and the same must be said of the sexualism of neurotic phantasy in general. It is not a primary phenomenon based upon a perverted sexual disposition, but merely secondary and a consequence of a failure to apply the stored-up libido in a suitable way. I realize that this is a very old view, but this does not prevent its being true. The fact that the patient himself very often believes that this infantile phantasy is the real cause of the neurosis, does not prove that he is right in his belief, or that a theory following the same belief is right either. It may look as if it were so, and I must confess that indeed very many cases do have that appearance. At all events, it is perfectly easy to understand how Freud came to this view. Every one having any psychoanalytic experience will agree with me here.

To sum up: I cannot see the real ætiology of a neurosis in the various manifestations of infantile sexual development and their corresponding phantasies. The fact that they are exaggerated and put into the foreground in neurosis is a consequence of the stored-up energy or libido. The psychological trouble in neurosis, and neurosis itself, can be considered *as an act of adaptation that has failed*. This formulation might reconcile certain views of Janet's with Freud's view, that a neurosis is—under a certain aspect—an attempt at self-cure; a view which can be and has been applied to many diseases.

Here the question arises whether it is still advisable to bring to light all the patient's phantasies by analysis, if we now consider them as of no ætiological significance. Psychoanalysis hitherto has proceeded to the unravelling of these phantasies because they were considered to be ætiologically significant. My altered view concerning the theory of neurosis does not change the procedure of psychoanalysis. The technique remains the same. We no longer imagine we are unearthing the end-root of the disease, but we have to pull up the sexual phantasies because the energy which the patient needs for his health, that is, for his adaptation, is attached to them. By means of psychoanalysis the connexion between the conscious and the libido in the unconscious is re-established. Thus you restore this unconscious libido to the command of conscious intention. Only in this way can the formerly split-off energy become again applicable to the accomplishment of the necessary tasks of life. Considered from this standpoint, psychoanalysis no longer appears to be a mere reduction of the individual to his primitive sexual wishes, but it becomes clear that, if rightly understood, it is a *highly moral task of immense educational value*.

CHAPTER IX

ON SOME CRUCIAL POINTS IN PSYCHOANALYSIS^[176]

CORRESPONDENCE BETWEEN DR. JUNG AND DR. LOÏ APPEARING IN "PSYCHOTHERAPEUTISCHE ZEITFRAGEN." PUBLISHED BY DR. LOÏ, SANATORIUM L'ABRI, TERRITET-MONTREUX, SWITZERLAND, 1914.

I

From Dr. Loï.

12th January, 1913.

What you said at our last conversation was extraordinarily stimulating. I was expecting you to throw light upon the interpretation of my own and my patients' dreams from the standpoint of Freud's "Interpretation of Dreams." Instead, you put before me an entirely new conception: the dream as a means of re-establishing the moral equipoise, fashioned in the realm below the threshold of consciousness. That indeed is a fruitful conception. But still more fruitful appears to me your other suggestion. You regard the problems of psychoanalysis as much deeper than I had ever thought: it is no longer merely a question of getting rid of troublesome pathological symptoms; the analysed person gets to understand not his anxiety-experiences alone, but his whole self most completely, and by means of this understanding he can build up and fashion his whole life anew. But he himself must be the builder, the Analyst only furnishes him with the necessary tools.

To begin with, I would ask you to consider what justification there is for the original procedure of Breuer and Freud, now entirely given up both by Freud himself and by you, but practised by Frank, for instance, as his only method: I mean "the abreaction of the inhibited effects under light hypnosis." Why have you given up the cathartic method? More particularly,

has light hypnosis in psychocatharsis a different value from suggestion during sleep, long customary in treatment by suggestion? that is, has it only the value which the suggestionist contributes, or does it claim to possess only the value which the patient's belief bestows upon it? Or, again, is suggestion in the waking-state equivalent to suggestion in hypnoidal states? This Bernheim now asserts to be the case, after having used suggestion for many years exclusively in hypnosis. You will tell me we must talk of psychoanalysis, not of suggestion. But I really mean this: is not the *suggestion*, by means of which the psychocatharsis in the hypnoidal state produces therapeutic effects, (modified naturally, by the patients' age, etc.) the main factor in the therapeutic success of the psychocatharsis? Frank, in his "*Affektstörungen*," says: "these partial adjustments of effect, suggestibility and suggestion, are almost altogether omitted in the psychocathartic treatment in light sleep, in so far as the content of the reproduced presentations is concerned." Is that really true? Frank himself adds: "How can meditation upon the dreams of youth in itself lead to the discharge of the stored-up anxiety, whether in hypnoidal states or under any other conditions? Must one not suppose, with much greater probability, that the anxiety-states would become more pronounced through such concentration upon them?" [I have noticed that myself, and much more than I at all liked.] One does indeed say to the patient: "First we must stir up, then afterwards comes peace." And it does come. But does it not come *in spite of the stirring-up process*, because gradually, by means of frequent talks under light hypnosis, the patient gets such confidence in the doctor that he becomes susceptible to direct suggestion, and that produces at first improvement and finally, cure? I go still further: in an analysis *in the waking-state*, is not the patient's belief that the *method employed will cure him*, coupled with his ever-growing trust in the doctor, a main cause of his cure? And I ask even further: in every systematically carried-out therapeutic treatment, is not faith in it, trust in the doctor, a main factor in its success? I will not indeed say the only factor, for one cannot deny that the physical, dietetic and chemical procedures, when properly selected, have a real effect in securing a cure, over and above the obvious effect of their indirect suggestion.

II

From Dr. Jung.

28th January, 1913.

With regard to your question as to the applicability of the cathartic method, the following is my standpoint: every method is good if it serves its purpose, including every method of suggestion, even Christian Science, Mental Healing, etc. "*A truth is a truth, when it works.*" It is quite another question whether a scientific physician can answer for it to his conscience should he sell little bottles of Lourdes-water because that suggestion is at times very useful. Even the so-called highly scientific suggestion-therapy employs the wares of the medicine-man and the exorcising Schaman. And please, why should it not? The public is not even now much more advanced and continues to expect miracles from the doctor. And truly those doctors should be deemed clever—worldly-wise in every respect—who understand the art of investing themselves with the halo of the medicine-man. Not only have they the biggest practices—they have also the best results. This is simply because countless physical maladies (leaving out of count the neuroses) are complicated and burdened with psychic elements to an extent scarcely yet suspected. The medical exorcist's whole behaviour betrays his full valuation of the psychic element when he gives the patient the opportunity of fixing his faith firmly upon the doctor's mysterious personality. Thus does he win the sick man's mind, which henceforth helps him indeed to restore his body also to health. The cure works best when the doctor really believes in his own formulæ, otherwise he may be overcome by scientific doubt and so lose the correct, convincing tone. I, too, for a time practised hypnotic suggestion enthusiastically. But there befell me three dubious incidents which I want you to note:—

1. Once there came to me to be hypnotised for various neurotic troubles a withered peasant-woman of some fifty years old. She was not easy to hypnotise, was very restless, kept opening her eyes—but at last I did succeed. When I waked her after about half an hour she seized my hand and with many words testified to her overflowing gratitude. I said: "But you are by no means cured yet, so keep your thanks till the end of the treatment."

She: "I am not thanking you for that, but—(blushing and whispering)—because you have been so *decent*." So she said, looked at me with a sort of tender admiration and departed. I gazed long at the spot where she had stood—and asked myself, confounded, "So decent?"—good heavens! surely she hadn't imagined, somehow or other.... This glimpse made me suspect for the first time that possibly the loose-minded person, by means of that notorious feminine (I should at that time have said "animal") directness of instinct, understood more about the essence of hypnotism than I with all my knowledge of the scientific profundity of the text-books. Therein lay my harmlessness.

2. Next came a pretty, coquettish, seventeen-year-old girl with a harassed, suspicious mother. The young daughter had suffered since early girlhood from *enuresis nocturna*, which, among other difficulties, hindered her from going to a boarding-school abroad.

At once I thought of the old woman and her wisdom. I tried to hypnotise the girl; she laughed affectedly and prevented hypnosis for twenty minutes. Of course I kept quiet and thought: I know why you laugh; you have already fallen in love with me, but I will give you proof of my decency in gratitude for your wasting my time with your challenging laughter. I succeeded in hypnotising her. Success followed at once. The enuresis stopped, and I therefore informed the young lady later that, instead of Wednesday, I would not see her again for hypnosis till the following Saturday. On Saturday she arrived with a cross countenance, presaging failure. The enuresis had come back again. I remembered my wise old woman, and asked: "When did the enuresis return?" She (unsuspecting), "Wednesday night." I thought to myself, There it is again, she wants to show me that I simply must see her on Wednesdays too; not to see me for a whole long week is too much for a tender, loving heart. But I was quite resolved to give no help to such annoying romancing, so I said, "To continue the hypnosis would be quite wrong under these circumstances. We must drop it for quite three weeks, to give the enuresis a chance to stop. Then come again for treatment." In my malicious heart I knew I should then be on my holiday and so the course of hypnotic treatment would come to an end. After the holidays my *locum tenens* told me the young lady had been there with the news that the enuresis had vanished, but her disappointment at not seeing me was very keen. The old woman was right, thought I.

3. The third case gave my joy in suggestion its death-blow. This was the manner of it. She was a lady of sixty-five who came stumbling into the consulting-room with a crutch. She had suffered from pain in the knee-joint for seventeen years, and this at times kept her in bed for many weeks. No doctor had been able to cure her, and she had tried every possible remedy of present-day medicine. After I had suffered the stream of her narrative to flow over me for some ten minutes, I said, "I will try to hypnotise you, perhaps that will do you good." She, "Oh yes, please do!" leaned her head on one side and fell asleep before ever I said or did anything. She passed into somnambulism and showed every form of hypnosis you could possibly desire. After half an hour I had the greatest difficulty in waking her; when at last she was awake she jumped up: "I am well, I am all right, you have cured me." I tried to make timid objections, but her praises drowned me. She could really walk. Then I blushed and said, embarrassed, to my colleagues: "Look! behold the wondrously successful hypnotic therapy." That day saw the death of my connection with treatment by suggestion; the therapeutic praise won by this case shamed and humiliated me. When, a year later, at the beginning of my hypnotic course, the good old lady returned, this time with the pain in her back, I was already sunk in hopeless cynicism; I saw written on her forehead that she had just read the notice of the re-opening of my clinic in the newspaper, that vexatious romanticism had provided her with a convenient pain in the back so that she might have a pretext for seeing me, and again let herself be cured in the same theatrical fashion. This proved true in every particular.

As you will understand, a man possessed of scientific conscience cannot endure such cases without embarrassment. There ripened in me the resolve to renounce suggestion altogether rather than to allow myself passively to be transformed into a miracle-worker. I wanted to understand what really went on in the souls of people. It suddenly seemed to me incredibly childish to think of dispelling an illness with charms, and that this should be the only result of our scientific endeavours for a psychotherapy. Thus for me the discovery of Breuer and Freud was a veritable deliverance. I took up their method with unalloyed enthusiasm and soon recognised how right Freud was, when at a very early date, indeed so far back as the *Studien ueber Hysterie*, he began to direct a searchlight upon the accompanying circumstances of the so-called trauma. I too soon discovered that certainly some traumata with an obvious etiological tinge are opportunely present.

But the greater number appeared highly improbable. So many of them seemed so insignificant, even so normal, that at most one could regard them as just providing the opportunity for the neurosis to appear. But what especially spurred my criticism was the fact that so many traumata were simply inventions of phantasy which had never really existed. This perception was enough to make me sceptical about the whole trauma-theory. (But I have dealt with these matters in detail in my lectures on the theory of psychoanalysis).^[177] I could no longer suppose that the hundred and one cathartic experiences of a phantastically puffed-up or entirely invented trauma were anything but the effect of suggestion. It is well enough if it helps. If one only had not a scientific conscience and that impulsion towards the truth! I found in many cases, especially when dealing with more mentally gifted patients, that I must recognise the therapeutic limitations of this method. It is, of course, a definite plan, and convenient for the doctor, since it makes no particular demands upon his intellect for new adaptations. The theory and practice are both of the pleasantest simplicity: "The neurosis is caused by a trauma. The trauma is abreacted." When the abreaction takes place under hypnotism, or with other magical accessories (dark room, peculiar lighting, and the rest), I remember once more the wise old woman, who opened my eyes not merely to the magic influence of the mesmeric gestures, but also to the essential character of hypnotism itself. But what alienated me once for all from this relatively efficacious indirect method of suggestion, based as it is upon an equally efficacious false theory, was the perception I obtained at the same time that, behind the confused deceptive intricacies of neurotic phantasies, there stands a *conflict*, which may be best described as a *moral* one. With this there began for me a new era of understanding. Research and therapy now coincided in the attempt to discover the causes and the *rational* solution of this conflict. That is what psychoanalysis meant to me. Whilst I had been getting this insight, Freud had built up his sexual theory of the neurosis, and therewith had brought forward an enormous number of questions for discussion, all of which I thought deserved the profoundest consideration. Thus I have had the good fortune of co-operating with Freud for a long time, and working with him in the investigation of the problem of sexuality in neurosis. You, perhaps, know from some of my earlier work that I was always dubious somewhat concerning the significance of sexuality.^[178] This

has now become the exact point where I am no longer altogether of Freud's opinion.

I have preferred to answer your questions in rather non-sequent fashion. Whatever is still unanswered, let me now repeat: *light hypnosis* and *complete hypnosis* are but varying grades of intensity of unconscious attraction towards the hypnotist. Who can here venture to draw sharp distinctions? To a critical intelligence it is unthinkable that suggestibility and suggestion can be excluded in the cathartic method. They are present everywhere and are universal human attributes, even with Dubois and the psychoanalysts who think they work on purely rational lines. *No technique, no self-deception avails here—the doctor works, nolens volens—and perhaps primarily—by means of his personality, that is by suggestion.* In the cathartic treatment, what is of far more importance to the patient than the conjuring up of old phantasies is the being so often with the doctor, and having confidence and belief in him personally, and in his method. The belief, the self-confidence, perhaps also the devotion with which the doctor does his work, are far more important things to the patient (*imponderabilia* though they be) than the recalling of old traumata.^[179]

Ultimately we shall some day know from the history of medicine everything that has ever been of service; then perhaps at last we may come to the really desirable therapy, to psychotherapy. Did not even the old materia medica of filth have brilliant cures?—cures which only faded away with the belief in it!

Because I recognise that the patient does attempt to lay hold of the doctor's personality, in spite of all possible rational safeguards, I have formulated the demand that the psychotherapist shall be held just as responsible for the cleanness of his own hands as is the surgeon. I hold it to be an absolutely indispensable preliminary that the psychoanalyst should himself first undergo an analysis, for his personality is one of the chief factors in the cure.

Patients read the doctor's character intuitively and they should find in him a human being, with faults indeed, but also a man *who has striven at every point to fulfil his own human duties in the fullest sense.* I think that this is the first healing factor. Many times I have had the opportunity of seeing that the analyst is successful with his treatment just in so far as he has succeeded

in his own moral development. I think this answer will satisfy your question.

III

From Dr. Loj.

2nd February, 1913.

You answer several of my questions in a decidedly affirmative sense. You take it as proved that in the cures by the cathartic method the main *rôle* is played by faith in the doctor and in his method, and not by the "abreaction" of real or imaginary traumata. I also. Equally I am at one with your view that the cures of the old *materia medica* of filth, as well as the Lourdes cures, or those of the Mental Healers, Christian Scientists and Persuasionists, are to be attributed to faith in the miracle-worker, rather than to any of the methods employed.

Now comes the ticklish point: the augur can remain an augur so long as he himself believes the will of the gods is made manifest by the entrails of the sacrificial beast. When he no longer believes, he has to ask himself: Shall I continue to use my augur's authority to further the welfare of the State, or shall I make use of my newer, and (I hope) truer convictions of to-day? Both ways are possible. The first is called opportunism; the second the pursuit of truth, and scientific honour. For a doctor, the first way brings perhaps therapeutic success and fame; the second, reproach: such a man is not taken seriously. What I esteem most highly in Freud and his school is just this passionate desire for truth. But again, it is precisely here that people pronounce a different verdict: "It is impossible for the busy practitioner to keep pace with the development of the views of this investigator and his initiates." (Frank, "Affektstörungen Einleitung.")

One can easily disregard this little quip, but one must take more seriously one's self-criticism. We may have to ask ourselves whether, since science is an undivided, ever-flowing stream, we are justified in relinquishing on

conscientious grounds any method or combination of methods by means of which we know cures can be achieved?

Looking more closely at the fundamental grounds of your aversion to the use of hypnosis (or semi-hypnosis, the degree matters nothing) in *treatment by suggestion*, (which as a matter of fact every doctor and every therapeutic method makes use of willy-nilly, no matter what it is called), it is clear that what has disgusted you in hypnotism is at bottom nothing but the so-called "transference" to the doctor, which you, with your unalloyed psychoanalytic treatment, can get rid of as little as any one else, for indeed it plays a chief part in the success of the treatment. Your insistence that the psychoanalyst must be answerable for the cleanness of his own hands—(here I agree with you unreservedly)—is an inevitable conclusion. But, after all, does anything more "augurish" really cling to the use made of hypnosis in psychotherapeutic treatment, than to the quite inevitable use made of the "transference to the doctor" for therapeutic ends? In either case we must perforce "take shares" in faith as a healing agent. As for the feeling which the patient—whether man or woman—entertains for the doctor, is there never anything in the background save conscious or unconscious sexual desire? In many cases your view is most certainly correct; more than one woman has been frank enough to confess that the beginning of hypnosis was accompanied by voluptuous pleasure. But this is not true in all instances—or how would you explain the underlying feeling in the hypnotising of one animal by another, *e.g.* snake and bird? Surely you can say that there the feeling of *fear* reigns, fear which is an inversion of the libido, such as comes upon the bride in that hypnoidal state before she yields to her husband wherein pure sexual desire rules, though possibly it contains an element of fear. However this may be, from your three cases I cannot draw any ethical distinction between the "unconscious readiness towards the hypnotist" and the "transference to the doctor" which should avail to condemn a combination of hypnotism and psychoanalysis as a method of treatment. You will ask why I cling to the use of hypnotism; or rather of hypnoidal states. Because I think there are cases that can be much more rapidly cured thereby, than through a purely psychoanalytic treatment. For example, in no more than five or six interviews I cured a fifteen-year-old girl who had suffered from *enuresis nocturna* from infancy, but was otherwise thoroughly healthy, gifted, and pre-eminent at school: she had previously tried all sorts of treatment without any result.

Perhaps I ought to have sought out the psychoanalytic connexion between the enuresis and her psychosexual attitude and explained it to her, etc., but I could not, she had only the short Easter holidays for treatment: so I just hypnotised her and the tiresome trouble vanished. It was a lasting cure.

In psychoanalysis I use hypnosis to help the patient to overcome "resistances."

Further, I use light hypnosis in association with psychoanalysis, to hasten the advance when the "re-education" stage comes.

For example, a patient afflicted with washing-mania was sent to me after a year's psychocathartic treatment by Dr. X. The symbolic meaning of her washing-ceremonial was first made plain to her; she became more and more agitated during the "abreaction" of alleged traumata in childhood, because she had persuaded herself by auto-suggestion that she was too old to be cured, that she saw no "images," etc. So I used hypnosis to help her to diminish the number of her washings, "so that the anxiety-feeling would be banished"; and to train her to throw things on the ground and pick them up again without washing her hands afterwards, etc.

In view of these considerations, if you feel disposed to go further into the matter, I should be grateful if you would furnish me with more convincing reasons why hypnotic treatment must be dispensed with; and explain how to do without it, or with what to replace it in such cases. Were I convinced, I would give it up as you have done, but what convinced you has, so far, not convinced me. *Si duo faciunt idem, non est idem.*

Now I want to consider another important matter to which you alluded, but only cursorily, and to put one question: behind the neurotic phantasies there stands, you say, almost always (or always) a moral conflict which belongs to the present moment. That is perfectly clear to me. Research and therapy coincide; their task is to search out the foundations and the rational solution of the conflict. Good. But can the rational solution always be found? "Reasons of expediency" so often bar the way, varying with the type of patient, for instance children, young girls and women from "pious" catholic or protestant families. Again that accursed opportunism! A colleague of mine was perfectly right when he began to give sexual enlightenment to a young French patient, a boy who was indulging in masturbation.

Whereupon, like one possessed, in rushed a bigoted grandmother, and a disagreeable sequel ensued. How to act in these and similar cases? What to do in cases where there arises a moral conflict between love and duty (a conflict in married life)?—or in general between instinct and moral duty? What to do in the case of a girl afflicted with hysterical or anxiety symptoms, needing love and having no chance to marry, either because she cannot find a suitable man or because, being "well-connected," she wants to remain chaste? Simply try to get rid of the symptoms by suggestion? But that is wrong as soon as one knows of a better way. How to reconcile these two consciences: that of the man who does not want to confine his fidelity to truth within his own four walls; and that of the doctor who must cure, or if he dare not cure according to his real convictions (owing to opportunist-motives), must at least procure some alleviation? We live in the present, but with the ideas and ideals of the future. That is *our* conflict. How resolve it?

IV

From Dr. Jung.

4th February, 1913.

You have put me in some perplexity by the questions in your yesterday's letter. You have rightly grasped the spirit which dictated my last. I am glad you, too, recognise this spirit. There are not very many who can boast of such tolerance. I should deceive myself if I regarded my standpoint as that of a practical physician. First and foremost I am a scientist; naturally that gives me a different outlook upon many problems. In my last letter I certainly left out of count the doctor's practical needs, but chiefly that I might show you on what grounds we might be moved to relinquish hypnotic therapy. To remove the first objection at once, let me say that I did not give up hypnotism because I desired to avoid dealing with the basic motives of the human soul, but rather because I wanted to battle with them *directly* and *openly*. When once I understood what kind of forces play a part in hypnotism I gave it up, simply to get rid of all the indirect advantages of this method. As we psychoanalysts see regretfully every day—and our patients also—we *do not work with the "transference to the doctor,"*^[180] *but against it and in spite of it.* It is just not upon the *faith* of the sick man that we can build, but upon his *criticism*. So much would I say at the outset upon this delicate question.

As your letter shows, we are at one in regard to the theoretical aspect of treatment by suggestion. So we can now apply ourselves to the further task of coming to mutual understanding about the practical question.

Your remarks on the physician's dilemma—whether to be magician or scientist—bring us to the heart of the discussion. I strive to be no fanatic—although there are not a few who reproach me with fanaticism. I contend not for the application of the psychoanalytic method solely and at all costs, but for the recognition of every method of investigation and treatment. I was a medical practitioner quite long enough to realise that practice obeys, and should obey, other laws than does the search after truth. One might almost say practice must first and foremost submit to the laws of opportunism. The scientist does great injustice to the practitioner if he reproaches him for not using the "one true" scientific method. As I said to you in my last letter: "A truth is a truth, when it works." But on the other hand, the practitioner must not reproach the scientist if in his search for truth and for newer and better methods, he makes trial of unusual ways. After all, it is not the practitioner but the investigator, and the latter's patient, who will have to bear any injury that may arise. The practitioner must certainly use those methods which he knows how to use to greatest advantage, and which give him the best relative results. My tolerance, indeed, extends, as you see, even to Christian Science. But I deem it most uncalled for that Frank, a practising doctor, should depreciate research in which he cannot participate, and particularly the very line of research to which he owes his own method. It is surely time to cease this running down of every new idea. No one asks Frank and all whom he represents to become psychoanalysts; we grant them the right to their existence, why should they always seek to cut ours short?

As my own "cures" show you, I do not doubt the effect of suggestion. Only I had the idea that I could perhaps discover something still better. This hope has been amply justified. Not for ever shall it be said—

"The good attained is oft of fairer still
The enemy, calling it vain illusion, falsehood's snare."

I confess frankly were I doing your work I should often be in difficulties if I relied only on psychoanalysis. I can scarcely imagine a general practice, especially in a sanatorium, with no other means than psychoanalysis. At Dr. Bircher's sanatorium in Zürich the principle of psychoanalysis is adopted completely by several of the assistants, but a whole series of other important educative influences are also brought to bear upon the patients, without which matters would probably go very badly. In my own purely psychoanalytic practice I have often regretted that I could not avail myself of the other methods of re-education that are naturally at hand in an institution—this, of course, only in special cases where one is dealing with extremely uncontrolled, uneducated persons. Which of us has shown any disposition to assert that we have discovered a panacea? There are cases in which psychoanalysis operates less effectively than any other known method. But who has ever claimed psychoanalysis should be employed in every sort of case, and on every occasion? Only a fanatic could maintain such a view. Patients for whom psychoanalysis is suitable have to be selected. I unhesitatingly send cases I think unsuitable to other doctors. As a matter of fact this does not happen often, because patients have a way of sorting themselves out. Those who go to an analyst usually know quite well why they go to him and not to some one else. However, there are very many neurotics well suited for psychoanalysis. In these matters every scheme must be looked at in due perspective. It is never quite wise to try to batter down a stone wall with your head. Whether simple hypnotism, the cathartic treatment, or psychoanalysis shall be used, must be determined by the conditions of the case and the preference of the *particular* doctor. Every doctor will obtain the best results with the instrument he knows best.

But, barring exceptions, *I must say definitely that for me, and for my patients also, psychoanalysis proves itself better than any other method.* This is not merely a matter of feeling; from manifold experiences I know many cases can indeed be cured by psychoanalysis which are refractory to all other methods of treatment. I have many colleagues whose experience is the same, even men engaged exclusively in practice. It is scarcely to be supposed that a method altogether contemptible would meet with so much support.

When once psychoanalysis has been applied in a suitable case, it is *imperative* that rational solutions of the conflicts should be found. The objection is at once advanced that many conflicts are intrinsically incapable of solution. That view is sometimes taken because only an external solution is thought of—and that, at bottom, is no real solution at all. If a man cannot get on with his wife he naturally thinks the conflict would be solved if he were to marry some one else. If such marriages are examined they are seen to be no solution whatsoever. The old Adam enters upon the new marriage and bungles it just as badly as he did the earlier one. *A real solution comes only from within, and only then because the patient has been brought to a new standpoint.*

Where an external solution is possible no psychoanalysis is necessary; in seeking an internal solution we encounter the peculiar virtues of psychoanalysis. The conflict between "love and duty" must be solved upon that particular plane of character where "love and duty" are no longer in opposition, for indeed they really are not so. The familiar conflict between "instinct and conventional morality" must be solved in such a way that both factors are taken

satisfactorily into account, and this is only possible through a change of character. This change psychoanalysis can bring about. In such cases external solutions are worse than none at all. Naturally the particular situation dictates which road the doctor must ultimately follow, and what is then his duty. I regard the conscience-searching question of the doctor's remaining true to his scientific convictions as rather unimportant in comparison with the incomparably weightier question as to how he can best help his patient. The doctor *must*, on occasion, be able to play the augur. *Mundus vult decipi*—but the cure is no deception. It is true that there is a conflict between ideal conviction and concrete possibility. *But we should ill prepare the ground for the seed of the future, were we to forget the tasks of the present, and sought only to cultivate ideals.* That is but idle dreaming. Do not forget that Kepler cast horoscopes for money, and that countless artists have been condemned to work for wages.

V.

From Dr. Loj.

9th February, 1913.

The selfsame passion for truth possesses us both when we think of pure research, and the same desire to cure when we are considering therapy. For the scientist, as for the doctor, we desire the fullest freedom in all directions, fullest freedom to select and use the methods which promise the best fulfilment of their ends at any moment. Here we are at one; but there remains a postulate we must establish to the satisfaction of others if we want recognition for our views.

First and foremost there is a question that must be answered, an old question asked already in the Gospels: *What is Truth?* I think clear definitions of fundamental ideas are most necessary. How shall we contrive a working definition of the conception "Truth"? Perhaps an allegory may help us.

Imagine a gigantic prism extending in front of the sun, so that its rays are broken up, but suppose man entirely ignorant of this fact. I exclude the invisible, chemical and ultra-violet rays. Men who live in a blue-lit region will say: "The sun sends forth blue light only." They are right and yet they are wrong: from their standpoint they are capable of perceiving only a *fragment* of truth. And so too with the inhabitants of the red, yellow, and in-between regions. And they will all scourge and slay one another to force *their* belief in *their* fragment upon the others—till, grown wiser through travelling in each others' regions, they come to the harmonious agreement that the sun sends out light of varying colours. That comprehends more truth, but it is not yet *the* Truth. Only when the giant lens shall have recombined the split-up rays, and when the invisible, chemical and heat rays have given proof of their own specific effects, will a view more in accordance with the facts be able to arise, and men will perceive that the sun emits white light which is split up by the prism into differing rays with different peculiarities, which rays can be recombined by the lens into one mass of white light.

This example shows sufficiently well that the road to Truth leads through far-reaching and comparative observations, the results of which must be controlled by the help of freely chosen *experiments*, until well-grounded hypotheses and theories can be put forward; but these hypotheses and theories will fall to the ground as soon as a single new observation or experiment contradicts them.

The way is difficult, and in the end all man ever attains to is *relative* truth. But such relative truth suffices for the time being, if it serves to explain the most important actual concatenations of the past, to light up present problems, to predict those of the future, so that we are then in a position to achieve adaptation through our knowledge. But *absolute* truth could be accessible only to omniscience, aware of all possible concatenations and combinations; that is not possible, for the concatenations and their combinations are infinite. Accordingly, we shall never know more than an approximate truth. Should new relationships be discovered, new combinations built up, then the picture changes, and with it the entire possibilities in knowledge and power. To what revolutions in daily life does not every new scientific discovery lead: how absurdly little was the beginning of our first ideas of electricity, how inconceivably great the results! Time and again it is necessary to repeat this commonplace, because one sees how life is always made bitter for the innovators in every scientific field, and now is it being made especially so for the disciples of the psychoanalytic school. Of course, every one admits the truth of this platitude so long as it is a matter of "academic" discussion, but only so long; just as soon as a concrete case has to be considered, sympathies and antipathies rush into the foreground and darken judgment. And therefore the scientist must fight tirelessly, appealing to logic and honour, for freedom of research in every field, and must not permit authority, of no matter what political or religious tinge, to advance reasons of *opportunism* to destroy or restrict this freedom; opportunist reasons may be and are in place elsewhere, not here. Finally we must completely disavow that maxim of the Middle Ages: "*Philosophia ancilla Theologiæ*," and no less, too, the war-cries of the university classrooms with their partisanship of one or other religious or political party. All fanaticism is the enemy of science, which must above all things be *independent*.

And when we turn from the search for Truth back once more to therapeutics, we see immediately that here too we are in agreement. In practice expediency *must* rule: the doctor from the yellow region must adapt himself to the sick in the yellow region, as must the doctor in the blue region, to his patients; both have the same object in view. And the doctor who lives in the white light of the sun must take into consideration the past experiences of his patients from the yellow or blue region, in spite of, or perhaps rather because of, his own wider knowledge. In such cases the way to healing will be long and difficult, may indeed lead more easily into a *cul-de-sac*, than in cases where he has to do with patients who, like himself, have already come to a knowledge of the white sunlight, or, one might say, when his patient-material has "already sorted itself out." With such sorted-out material the psychoanalyst can employ psychoanalysis exclusively; and may deem himself happy in that he need not "play the augur." Now, what are these psychoanalytic methods? If I understand you aright, from beginning to end it is a question of dealing directly and openly with *the basic forces of the human soul*, so that the analysed person, be he sick or sound or in some stage between—for health and sickness flow over by imperceptible degrees into one another—shall gradually have his eyes opened to the drama that is being acted within him. He has to come to an understanding of the development of the hostile automatisms of his personality, and by

means of this understanding he must gradually learn to free himself from them; he must learn, too, how to employ and strengthen the favourable automatisms. He must learn to make his self-knowledge real, and of practical use, to control his soul's workings so that a balance may be established between the spheres of emotion and reason. And what share in all this has the physician's *suggestion*? I can scarcely believe that suggestion can be altogether avoided till the patient feels himself really *free*. Such freedom, it goes without saying, is the main thing to strive for, and it must be *active*. The sick man who simply obeys a suggestion, obeys it only just so long as the "transference to the doctor" remains potent.

But if he wishes to be able to adjust himself to all circumstances he must have fortified himself "from within." He should no longer need the crutches of faith, but be capable of encountering all theoretical and practical problems squarely, and of solving them by himself. That is surely your view? Or have I not understood correctly?

I next ask, must not every single case be treated differently, of course *within the limits of the psychoanalytic method*? For if every case is a case by itself, it must indeed demand individual treatment.

"Il n'y a pas de maladies, il n'y a que des malades," said a French doctor whose name escapes me. But *on broad lines*, what course, from a technical point of view, does analysis take, and what deviations occur most frequently? That I would gladly learn from you. I take for granted that all "augurs' tricks," darkened rooms, masquerading, chloroform, are out of the question.

Psychoanalysis—purged so far as is humanly possible from suggestive influence—appears to have an essential difference from Dubois' psychotherapy. With Dubois, from the beginning conversation about the past is forbidden, and "the moral reasons for recovery" placed in the forefront; whilst psychoanalysis uses the subconscious material from the patient's past as well as present, for present self-understanding. Another difference lies in the conception of morality: morals are above all "*relative*." But what essential forms shall they assume at those moments when one can hardly avoid suggestion? You will say, the occasion must decide. Agreed, as regards older people, or adults, who have to live in an unenlightened *milieu*. But if one is dealing with children, the seed of the future, is it not a sacred duty to enlighten them as to the shaky foundations of the so-called "moral" conceptions of the past, which have only a dogmatic basis; is it not a duty to educate them into full freedom by courageously unveiling Truth? I ask this not so much with regard to the analysing doctor as to the teacher. May not the creation of *free schools* be looked for as one task for the psychoanalyst?

VI.

From Dr. Jung.

11th February, 1913.

The idea of the relativity of "Truth" has been current for ages, but whether true or not, it does not stand in the way of anything save the beliefs of dogma and authority.

You ask me, or indeed tell me—what psychoanalysis is. Before considering your views, permit me first to try and mark out the territory and definition of psychoanalysis. Psychoanalysis is primarily just a method—but a method complying with all the rigorous demands insisted upon to-day by the conception "method." Let it be made plain at once that psychoanalysis is not an *anamnesis*, as those who know everything without learning are pleased to believe. It is essentially a method for the exploration of the unconscious associations, into which no question of the conscious self enters. Again, it is not a *kind of examination* of the nature of an intelligence test, though this mistake is common in certain circles. It is no *cathartic method*, abreacting real and phantastic "traumata," with or without hypnosis. *Psychoanalysis is a method which makes possible the analytic reduction of the psychic content to its simplest expression, and the discovery of the line of least resistance in the development of a harmonious personality.* In neurosis, straightforward direction of life's energies is lacking, because opposing tendencies traverse and hinder psychological adaptation. Psychoanalysis, so far as our present knowledge of it goes, thus appears to be simply a rational nerve-therapy.

For the technical application of psychoanalysis no programme can be formulated. There are only general principles, and, for the individual case, working rules. (Here let me refer you to Freud's work in volume I. of the *Internationale Zeitschrift für Ärztliche Psychoanalyse*.) My one working rule is to conduct the analysis as a perfectly ordinary, sensible conversation, and to avoid all appearance of medical magic.

The leading principle of the psychoanalytic technique is to analyse the *psychic material which offers itself then and there*. Every interference on the part of the analyst, with the object of inducing the analysis to follow some systematic course, is a gross mistake in technique. *So-called chance is the law and the order of psychoanalysis.*

Naturally in the beginning of the analysis the anamnesis and the diagnosis come first. The subsequent analytic process develops quite differently in every case. To give rules is well-nigh impossible. All one can say is that very frequently, quite at the beginning, a series of resistances have to be overcome, resistances against both method and man. Patients having no idea of psychoanalysis must first be given some understanding of the method. In those who already know something of it there are very often many misconceptions to set right, and frequently one has to deal also with many reproaches cast by scientific criticism. In either case the misconceptions rest upon arbitrary interpretations, superficiality, or complete ignorance of the facts.

If the patient is himself a doctor his special knowledge may prove extremely tiresome. To intelligent colleagues it is best to give a complete theoretic exposition. With foolish and limited persons you begin quietly with analysis. In the unconscious of such folk there is a confederate that never refuses help. From the analysis of the very earliest dreams the emptiness of the criticism is obvious; and ultimately of the whole beautiful edifice of supposedly scientific scepticism nothing remains, save a little heap of personal vanity. I have had amusing experiences here.

It is best to let the patient talk freely and to confine oneself to pointing out connexions here and there. When the conscious material is exhausted we come to the dreams, which furnish us with the subliminal material. If people have no dreams, as they allege, or if they forget them,

there is usually still some conscious material that ought to be produced and discussed, but is kept back owing to resistances. When the conscious is emptied then come the dreams, which are indeed, as you know, the chief material of the analysis.

How the "Analysis" is to be made and what is to be said to patients depends, firstly, upon the material to be dealt with; secondly, on the doctor's skill; and, thirdly, on the patient's capacity. I must insist that no one ought to undertake analysis except on the basis of a sound knowledge of the subject; that necessitates an intimate understanding of the existing literature. Without this, the work may be bungled.

I do not know what else to tell you beforehand. I must wait for further questions. In regard to questions of morality and education let me say that these belong to the later stages of the analysis, wherein they find—or should find—solutions for themselves. *You cannot compile recipes out of psychoanalysis.*

VII

From Dr. Löj.

10th February, 1913.

You write that a solid knowledge of the psychoanalytic literature is necessary for initiation into psychoanalysis. I should agree, but with a certain reservation: the more one reads, the more one notices how many contradictions there are among the different writers, and less and less does one know—until one has had sufficient personal experience—to which view to give adherence, since quite frequently assertions are made without any proof. For example, I had thought (strengthened in the view by my own experience of suggestion-therapy) that the transference to the doctor might be an essential condition in the patient's cure. But you write: "We psychoanalysts do not build upon the patient's faith, rather do we have to deal with his criticism." And Stekel writes, on the other hand (*Zentralblatt für Psychoanalyse*, 3rd year, vol. IV., p. 176, "Ausgänge der psychoanalytischen Kuren"): "Love for the doctor can become a power essential to recovery. Neurotics never get well for love of themselves. They recover out of love for the doctor. They give him that pleasure." Here again, surely, stress is laid on the power of suggestion? And yet Stekel too thinks he is a psychoanalyst pure and simple. On the other hand, you say in your letter of Jan. 20th that "the doctor's personality is one of the main factors in the cure." Should not this expression be translated: "When the doctor inspires respect in the patient and is worthy of his love, the patient will gladly follow his example and endeavour to recover from his neurosis and fulfil his human duties in the widest sense"? I think one can only emerge from all this uncertainty by means of much personal experience, which will indicate also which way best suits one's own personality and brings the greatest therapeutic success. This is a further reason for undergoing analysis oneself, to recognise fully what one is. I was decidedly in agreement with your definition of psychoanalysis in its first (negative) portion: psychoanalysis is neither an *anamnesis* nor a *method of examination* after the fashion of a test for intelligence, nor yet a *psychocatharsis*. In your second (positive) part, however, your definition: "Psychoanalysis is a method of discovering the line of least

resistance to the harmonious development of the whole personality," seems to me valid for the patient's inertia, but not for the releasing of the sublimated libido with a view to the new direction of life. You consider that the neurosis causes a lack of singleness of aim in life, because opposing tendencies hinder psychic adaptation. True, but will not this psychic adaptation eventuate quite differently according as the patient, when well, directs his life either to the avoidance of pain merely (line of least resistance) or to the achievement of the greatest pleasure?—In the first case he would be more passive, he would merely reconcile himself "to the emptiness of reality" (Stekel, *loc. cit.*, p. 187). In the second he would be "filled with enthusiasm" for something or other or some person or other. But what will determine this choice of his as to whether he will be passive rather than active in his "second life"? In your view, will the determining factor manifest itself spontaneously in the course of the analysis, and must the doctor carefully avoid swaying the balance to one side or other by his influence? Or must he, if he does *not* renounce the right to canalise the patient's libido in some particular direction, renounce the right to be called a psychoanalyst, and is he to be regarded as "moderate" or altogether as "wild"?^[181] (Cf. Furtmüller, "Wandlungen in der Freudschen Schule," *Zentralblatt für Psychoanalyse*, vols. IV., V., 3rd year, p. 191.) But I think you have already answered this question, since in your last letter you write: "Every interference on the part of the analyst is a gross mistake in technique. So-called chance is the law and the order of psychoanalysis." But, torn from its context, perhaps this does not quite give your whole meaning. With regard to detailed explanation of the psychoanalytic method before the beginning of the analysis, I think you agree with Freud and Stekel: give too little rather than too much. For the knowledge *instilled into* a patient remains more or less half-knowledge, and half-knowledge engenders "the desire to know better" (than the analyst), which only impedes progress. So, after brief explanation, first "let the patient talk," then and there point out connexions, then after the exhaustion of the conscious material, take dreams.

But there another difficulty confronts me which I have already pointed out in our talks: you find the patient adapting himself to the doctor's tone, language, jargon, whether from conscious imitation, transference, or even resistance, when he can fight the analyst with his own weapons; how then can you possibly prevent his beginning to produce all manner of phantasies as supposedly real traumata of early childhood, and *dreams* supposedly spontaneous which are in reality, though not designedly, directly or indirectly *suggested*? I then told you that Forel ("Der Hypnotismus") made his patients dream just what he wanted, and I have myself easily repeated the experiment. But if the analyst desires to *suggest nothing*, should he remain silent for the most part and let the patient speak—except that in interpreting dreams he may lay before the patient his own interpretation?

VIII

From Dr. Jung.

18th February, 1913.

I cannot but agree with your observation that confusion reigns in psychoanalytic literature. Just at this moment different points of view are developing in the theoretical conception of the analytic results; not to mention many individual deviations. Over against Freud's almost purely *causal* conception, there has developed, apparently in absolute contradiction, Adler's purely *final* view, but in reality the latter is an essential complement of Freud's theory. I hold rather to a middle course, taking into account both standpoints. That discord still reigns round the ultimate questions of psychoanalysis need not surprise us when we consider the difficulty. The problem of the therapeutic effect of psychoanalysis is bound up in particular with supremely difficult questions, so that it would indeed be astonishing if we had yet reached final certitude. Stekel's statement to which you refer is very characteristic. What he says about love for the doctor is obviously true, but it is a simple affirmation, and not a goal or plumb-line of the analytic therapy. If his statement were the goal, many cures, it is true, would be possible, but also many calamities might result which are avoidable. But the aim is so to educate the patient that he will get well for his own sake and by reason of his own determination, rather than to procure his doctor some sort of advantage; though of course it would be absurd from the therapeutic standpoint not to allow the patient to get better because in doing so he does the doctor a good turn also. It suffices if the patient knows it. But we must not prescribe for him which path he should take to recovery. Naturally it seems to me (from the psychoanalytic standpoint) an inadmissible use of suggestive influence if the patient is compelled to get better out of love for the doctor. And indeed such compulsion may sometimes take bitter revenge. The "you must and shall be saved" is no more to be commended in nerve-therapy than in any other department of life. It contradicts the principle of analytic treatment, which shuns all coercion and desires to let everything grow up from within. I do not, as you know, object to influencing by use of suggestion in general, but merely to a doubtful motivation. If the doctor demands that his patient shall get well from love of himself, the patient may easily reckon on reciprocal services and will without doubt try to extort them. I can but utter a warning against any such method. A far stronger motive for recovery—also a far healthier and ethically more valuable one—consists in the patient's thorough insight into the real state of affairs, the recognition of how things are now and how they ought to be. The man of any sort of worth will then discern that he can hardly sit down at ease in the quagmire of his neurosis.

With your rendering of what I said about the healing power of personality I cannot entirely agree. I wrote that the doctor's personality has a power for healing because the patient reads the doctor's personality: not that he produces a cure through *love* of the doctor. The doctor cannot prevent the patient's beginning to behave himself towards *his* conflicts just as the doctor himself behaves, for nothing is finer than a neurotic's intuition. *But every strong transference serves this same purpose.* If the doctor makes himself charming, he buys off from the patient a series of resistances which he should have overcome, and whose overcoming will certainly have to be gone through later on. Nothing is won by this technique; at most the beginning of the analysis is made easy for the patient (though this is not quite without its use in certain cases). To be able to crawl through a barbed wire fence without some enticing end in view testifies to an ascetic strength of will which you can expect neither from the ordinary person nor from the neurotic. Even the Christian religion, whose moral demands certainly reached a great height, thought it no scorn to represent the near approach of the Kingdom of Heaven as goal and reward of earthly pain. In my view, the doctor may

well speak of the rewards which follow the toils of analysis. But he must not depict himself or his friendship, in hints or promises, as reward, if he is not seriously determined to keep his word.

In regard to your criticism of my outline-definition of the conception of psychoanalysis, it must be observed that the road over the steep mountain is the line of least resistance only when a ferocious bull waits for you in the pleasant valley-road. In other words, the line of least resistance is a compromise with *all* demands, and not with inertia alone. It is prejudice to think that the line of least resistance coincides with the path of inertia. (That's what we thought in the days when we dawdled over Latin exercises.) Inertia is only an immediate advantage and leads to consequences which produce the worst resistances; as a whole, it does not lie in the direction of least resistance. Life along the line of least resistance is not synonymous with a man's regardless pursuit of his own egoistic desires. He who lives thus soon painfully perceives that he is not moving along the line of least resistance, for he is also a social being, and not merely a bundle of egoistic instincts, as some people rather like to depict him. This is best seen among primitive men and herd-animals, who all have a richly developed social sense. Without it, indeed, the herd could not exist at all. Man as herd-animal has therefore by no manner of means to subject himself to laws enforced on him from without; he carries his social imperatives within himself, *a priori*, as an inborn necessity. As you see, I here put myself in decided opposition to certain views—I think quite unjustified—which have been put forth here and there inside the psychoanalytic movement.

So the line of least resistance does not signify *eo ipso* the avoidance of unpleasure so much as the just balancing of unpleasure and pleasure. Painful activity by itself leads to no result but exhaustion. Man must be able to take pleasure in his life, or the struggle of life has no reward. What direction the patient's future life should take is not ours to judge. We must not imagine we know better than his own nature—or we prove ourselves educators of the worst kind. Psychoanalysis is but a means of removing stones from the path, and in no way a method (as hypnotism often pretends to be) of putting anything into the patient which was not there before. So we renounce any attempt to give a direction, and occupy ourselves only with setting in proper relief all that analysis brings into the light of day, in order that the patient may see clearly, and be in a position to draw the appropriate conclusions. Anything that he has not himself won, he does not in the long run believe in; and all that he has received from authority keeps him still infantile. He must rather be put in such a position as will enable him to take control of his own life. It is the art of the psychoanalyst to follow the patient's apparently mistaken paths without prejudice, and thus to discover his strayed and separated sheep. Working on a system, according to a preconceived scheme, we spoil the best results of the analysis. So I hold fast to the maxim you quote from me: "Every interference on the part of the analyst is a gross mistake in technique. So-called chance is the law and the order of psychoanalysis."

You surely recognise that the schoolmaster-view never releases us from the attempt to correct Nature and the desire to force upon her our limited "truths." In nerve-therapy we get so many wonderful experiences—unforeseen and impossible to foresee—that surely we ought to dismiss all hope of being infallibly able to point out the right path. The roundabout way and even the wrong way are necessary. If you deny this you must also deny that the errors in the

history of the whole world have been necessary. That indeed were a world-conception fit for a schoolmaster. For psychoanalysis this view suits not at all.

The question as to how much the analyst involuntarily suggests to the patient is a very ticklish one. Undoubtedly that has a much more important place than psychoanalysts have till now admitted. Experience has convinced us that the patient rapidly avails himself of the ideas won through the analysis, and of whatever comes to light through the shaping of the dreams. You may obtain all manner of such impressions from Stekel's book: "Die Sprache des Traumes" ("The Language of the Dream"). I had once a most instructive experience: a very intelligent lady had from the beginning extreme transference phantasies which appeared in well-recognised erotic forms. Nevertheless she entirely declined to admit their existence. Of course she was betrayed by the dreams in which my own person was hidden behind some other figure, and often difficult to unveil. A long series of such dreams forced me at last to say: "So you see it is always like that, and the person of whom one has really dreamt is replaced and hidden by some one else in the manifest dream." Till then the patient had obstinately contested this point. But this time she could no longer evade it, and had to admit my rule—but only that she might play me a trick. Next day she brought me a dream in which she and I appeared in a manifest lascivious situation. I was naturally perplexed and thought of my rule. Her first association to the dream was the malicious question: "It's always true, isn't it, that the person of whom one is really dreaming is replaced by some one else in the manifest dream-content?"

Clearly, she had made use of her experience to find a protective formula by means of which she secured the open expression of her phantasies in an apparently innocent way.

This example aptly shows how patients avail themselves of insight gained during analysis; they use it symbolically. You get caught in your own net if you give credence to the idea of unalterable, permanent symbols. That has already happened to more than one psychoanalyst. It is therefore fallacious to try to prove any particular theory from the dreams arising in the course of analysis. For this purpose the only conclusive dreams are those derived from demonstrably uninfluenced persons. In such cases one would only have to exclude the possibility of telepathic thought-reading. But if you concede this possibility you will have to subject very many things to a rigorous re-examination and, among others, many judicial verdicts.

But although we must do full justice to the force of suggestion, we must not overrate it. The patient is no empty sack into which you may stuff whatever you like; on the contrary, he brings his own predetermined contents which strive obstinately against suggestion and always obtrude themselves afresh. Through analytic "suggestions," only the outward *form* is determined, never the content—this is always being freshly impressed upon my notice. The form is the unlimited, the ever-changing; but the content is fixed, and only to be assailed slowly and with great difficulty. Were it not so, suggestion-therapy would be in every respect the most effective, profitable, and easiest therapy,—a real panacea. That, alas! it is not, as every honourable hypnotist will freely admit.

To return to your question as to how far it is conceivable that patients may deceive the doctor by making use—perhaps involuntarily—of his expressions: this is indeed a very serious problem. The analyst must exercise all possible care and practise unsparing self-criticism if

he would avoid, as far as possible, being led into error by patients' dreams. It may be admitted that they almost always use modes of expression in their dreams learnt in analysis—some more, some less. Interpretations of earlier symbols will themselves be used again as fresh symbols in later dreams. It happens not seldom, for instance, that sexual situations which appear in symbolic form in the earlier dreams, will appear "undisguised" in later ones, and here again they are the symbolic expression of ideas of another character capable of further analysis. The not infrequent dream of incestuous cohabitation is by no means an "undisguised" content, but a dream as freshly symbolic and capable of analysis as all others. You surely only reach the paradoxical view that such a dream is "undisguised" if you are pledged to the sexual theory of neurosis.

That the patient may mislead the doctor for a longer or shorter time by means of deliberate deception and misrepresentation is possible; just as occasionally happens in all other departments of medicine. Therewith the patient injures himself most, since he has to pay for every deception or suppression, with aggravated or additional symptoms. Deceptions are so obviously disadvantageous to himself that in the end he can scarcely avoid the definite relinquishment of such a course.

The technique of analysis we can best postpone for oral discussion.

IX

From Dr. Loj.

23rd February, 1913.

From your letter of 16th February I want first to single out the end, where you so admirably assign to its proper place the power of suggestion in psychoanalysis: "The patient is no empty sack, into which you can cram what you will; he brings his own predetermined content with him, with which one has always to reckon afresh." With this I fully agree, my own experience confirms it. And you add: "This content remains untouched by involuntary analytical suggestion, but its form is altered, proteus-fashion, beyond measure." So it becomes a matter of a sort of "mimicry" by which the patient seeks to escape the analyst, who is driving him into a corner and therefore for the moment seems to him an enemy. Until at last, through the joint work of patient and analyst—the former spontaneously yielding up his psychic content, the latter only interpreting and explaining—the analysis succeeds in bringing so much light into the darkness of the patient's psyche that he can see the true relationships and, without any preconceived plan of the analyst's, can himself draw the right conclusions and apply them to his future life. This new life will betake itself along the line of least resistance—or should we not rather say, the least resistances, as a "compromise with all the necessities," in a just balancing of pleasure and unpleasure? It is not we who must arbitrarily seek to determine how matters stand for the patient and what will benefit him; his own nature decides. In other words, we must assume the *rôle* of the accoucheur who can bring out into the light of day a child already alive, but who must avoid a series of mistakes if the child is to remain able to live and the mother is not to be injured. All this is very clear to me, since it is only the

application to the psychoanalytic method of a general principle which should have universal validity: never do violence to Nature. Hence I also see that the psychoanalyst must follow his patient's apparently "wrong roads" if the patient is ever to arrive at his own convictions and be freed once and for all from infantile reliance on authority. We ourselves as individuals have learnt or can only learn by making mistakes how to avoid them for the future, and mankind as a whole has created the conditions of its present and future stages of development quite as much by frequent travel along wrong paths as along the right road. Have not many neurotics—I do not know if you will agree, but I think so—become ill partly for the very reason that their infantile faith in authority has fallen to pieces? Now they stand before the wreckage of their faith, weeping over it, in dire distress because they cannot find a substitute which shall show them clearly whither their life's course should now turn. So they remain stuck fast betwixt infancy which they must unwillingly renounce, and the serious duties of the present and future (the moral conflict). I see, particularly in such cases, you are right in saying it is a mistake to seek to replace the lost faith in authority by another similar faith, certain to be useful only so long as the belief lasts. This applies to the deliberate use of suggestion in psychoanalysis, and the building upon the transference to the doctor as the object of the analytic therapy. I am no longer in doubt about your maxim: "Every interference on the analyst's part is a gross mistake in technique. So-called chance is the law and the order of psychoanalysis." Further, I am entirely in agreement with you when you say that *altruism necessarily must be innate in man considered as a herd-animal*. The contrary would be the thing to be wondered at.

I should be much disposed to agree that not the egoistic, but the altruistic instincts are primary. Love and trust of the child for the mother who feeds it, nurses, cherishes and pets it,—love of the man for his wife, regarded as the going out towards another's personality,—love for offspring, care for it,—love for kinsfolk, etc. The egoistic instincts owe their origin to the desire for exclusive possession of all that surrounds love, the desire to possess the mother exclusively, in opposition to the father and the brothers and sisters, the desire to have a woman for himself alone, the desire to possess exclusively ornaments, clothing, etc. But perhaps you will say I am paradoxical and that the instincts, egoistic or altruistic, arise together in the heart of man, and that every instinct is ambivalent in nature. But I have to ask if the feelings and instincts are really ambivalent? Are they exactly bipolar? Are the qualities of all emotions altogether comparable? Is love really the opposite of hate?

However that may be, in any case it is well that man bears the social law within himself, as an inborn imperative; otherwise our civilised humanity would fare badly, having to subject themselves to laws imposed on them from outside only: they would be impervious to the inheritance of the earlier religious faiths, and would soon fall into complete anarchy. Man would then have to ask himself whether it would not be better to maintain by force an extreme belief in religious authority such as prevailed in the Middle Ages. For the benefits of civilisation, which strove to grant every individual as much outward freedom as was consistent with the freedom of others, would be well worth the sacrifice of free research. But the age of this use of force against nature is past, civilised man has left this wrong track behind, not arbitrarily, but obeying an inner necessity, and we may look joyfully towards the future. Mankind, advancing in knowledge, will find its way across the ruins of faith in authority to the moral autonomy of the individual.

X

From Dr. Jung.

March, 1913.

At various places in your letters it has struck me that the problem of "transference" seems to you particularly critical. Your feeling is entirely justified. The transference is indeed at present the central problem of analysis.

You know that Freud regards the transference as the projection of infantile phantasies upon the doctor. To this extent the transference is an infantile-erotic relationship. All the same, viewed from the outside, superficially, the thing by no means always looks like an infantile-erotic situation. As long as it is a question of the so-called "positive" transference, the infantile-erotic character can usually be recognised without difficulty. But if it is a "negative" transference, you can see nothing but violent resistances which sometimes veil themselves in seemingly critical or sceptical dress. In a certain sense the determining factor in such circumstances is the patient's relation to authority, that is, in the last resort, to the father. In both forms of transference the doctor is treated as if he were the father—according to the situation either tenderly or with hostility. In this view the transference has the force of a resistance as soon as it becomes a question of resolving the infantile attitude. But this form of transference must be destroyed, inasmuch as the object of analysis is the patient's moral autonomy. A lofty aim, you will say. Indeed lofty, and far off, but still not altogether so remote, since it actually corresponds to one of the predominating tendencies of our stage of civilisation, namely, that urge towards individualisation by which our whole epoch deserves to be characterised. (Cf. Müller-Lyer: "Die Familie.") If a man does not believe in this orientation and still bows before the scientific causal view-point, he will, of course, be disposed merely to resolve this hostility, and to let the patient remain in a positive relationship towards the father, *thus expressing the ideal of an earlier epoch of civilisation*. It is commonly recognised that the Catholic Church represents one of the most powerful organisations based upon this earlier tendency. I cannot venture to doubt that there are very many individuals who feel happier under compulsion from others than when forced to discipline themselves. (Cf. Shaw: "Man and Superman.") None the less, we do our neurotic patients a grievous wrong if we try to force them all into the category of the unfree. Among neurotics, there are not a few who do not require any reminders of their social duties and obligations; rather are they born or destined to become the bearers of new social ideals. They are neurotic so long as they bow down to authority and refuse the freedom to which they are destined. Whilst we look at life only retrospectively, as is the case in the Viennese psychoanalytic writings, we shall never do justice to this type of case and never bring the longed-for deliverance. For in that fashion we can only educate them to become obedient children, and thereby strengthen the very forces that have made them ill—their conservative retardation and their submissiveness to authority. Up to a certain point this is the right way to take with the infantile resistance which cannot *yet* reconcile itself with authority. But the power which edged them out from their retrograde dependence on the father is not at all a childish desire for insubordination, but the powerful urge towards the development of an

individual personality, and this struggle is their imperative life's task. Adler's psychology does much greater justice to this situation than Freud's.

In the one case (that of infantile intractability) the positive transference signifies a highly important achievement, heralding cure; in the other (infantile submissiveness) it portends a dangerous backsliding, a convenient evasion of life's duty. The negative transference represents in the first case an increased resistance, thus a backsliding and an evasion of duty, but in the second it is an advance of healing significance. (For the two types, cf. Adler's "Trotz und Gehorsam.")

The transference then is, as you see, to be judged quite differently in different cases.

The psychological process of "transference"—be it negative or positive—consists in the libido *entrenching itself*, as it were, round the personality of the doctor, the doctor accordingly representing certain emotional values. (As you know, by *libido* I understand very much what Antiquity meant by the cosmogenic principle of *Eros*; in modern terminology simply "psychic energy.") The patient is bound to the doctor, be it in affection, be it in opposition, and cannot fail to follow and imitate the doctor's psychic adaptations. To this he finds himself urgently compelled. And with the best will in the world and all technical skill, the doctor cannot prevent him, for intuition works surely and instinctively, in despite of the conscious judgment, be it never so strong. Were the doctor himself neurotic, and inadequate in response to the demands of the external life, or inharmonious within, the patient would copy the defect and build it up into the fabric of his own presentations: you may imagine the result.

Accordingly I cannot regard the transference as merely the transference of infantile-erotic phantasies; no doubt that is what it is from one standpoint, but I see also in it, as I said in an earlier letter, the process of the *growth of feeling* and *adaptation*. From this standpoint the infantile erotic phantasies, in spite of their indisputable reality, appear rather as material for comparison or as analogous pictures of something not understood as yet, than as independent desires. This seems to me the real reason of their being unconscious. The patient, not knowing the right attitude, tries to grasp at a right relationship to the doctor by way of comparison and analogy with his infantile experiences. It is not surprising that he gropes back for just the most intimate relations of his childhood, to discover the appropriate formula for his attitude to the doctor, for this relationship also is very intimate, and to some extent different from the sexual relationship, just as is that of the child towards its parents. This relationship—child to parent—which Christianity has everywhere set up as the symbolic formula for human relationships, provides a way of restoring to the patient that directness of ordinary human emotion of which he had been deprived through the inroad of sexual and social values (from the standpoint of power, etc.). The purely sexual, more or less primitive and barbaric valuation, operates in far-reaching ways against a direct, simple human relationship, and thereupon a blocking of the libido occurs which easily gives rise to neurotic formations. By means of analysis of the infantile portion of the transference-phantasies, the patient is brought back to the remembrance of his childhood's relationship, and this—stripped of its infantile qualities—gives him a beautiful, clear picture of direct human intercourse as opposed to the purely sexual valuation. I cannot regard it as other than a misconception to judge the childish relationship retrospectively and therefore as exclusively a sexual one, even though a certain sexual content can in no wise be denied to it.

Recapitulating, let me say this much of the positive transference:—

The patient's libido fastens upon the person of the doctor, taking the shape of expectation, hope, interest, trust, friendship and love. Then the transference produces the projection upon the doctor of infantile phantasies, often of predominatingly erotic tinge. At this stage the transference is usually of a decidedly sexual character, in spite of the sexual component remaining relatively unconscious. But this phase of feeling serves the higher aspect of the growth of human feeling as a bridge, whereby the patient becomes conscious of the defectiveness of his own adaptation, through his recognition of the doctor's attitude, which is accepted as one suitable to life's demands, and normal in its human relationships. By help of the analysis, and the recalling of his childish relationships, the road is seen which leads right out of those exclusively sexual or "power" evaluations of social surroundings which were acquired in puberty and strongly reinforced by social prejudices. This road leads on towards a purely human relation and intimacy, not derived solely from the existence of a sexual or power-relation, but depending much more upon a regard for personality. That is the road to freedom which the doctor must show his patient.

Here indeed I must not omit to say that the obstinate clinging to the sexual valuation would not be maintained so tenaciously if it had not also a very deep significance for that period of life in which propagation is of primary importance. The discovery of the value of human personality belongs to a riper age. For young people the search for the valuable personality is very often merely a cloak for the evasion of their biological duty. On the other hand, an older person's exaggerated looking back towards the sexual valuation of youth, is an undiscerning and often cowardly and convenient retreat from a duty which demands the recognition of personal values and his own enrolment among the ranks of the priesthood of a newer civilisation. The young neurotic shrinks back in terror from the extension of his tasks in life, the old from the dwindling and shrinking of the treasures he has attained.

This conception of the transference is, you will have noted, most intimately connected with the acceptance of the idea of biological "*duties*." By this term you must understand those tendencies or motives in human beings giving rise to civilisation, as inevitably as in the bird they give rise to the exquisitely woven nest, and in the stag to the production of antlers. The purely causal, not to say materialistic conception of the immediately preceding decades, would conceive the organic formation as the reaction of living matter, and this doubtless provides a position heuristically useful, but, as far as any real understanding goes, leads only to a more or less ingenious and *apparent* reduction and postponement of the problem. Let me refer you to Bergson's excellent criticism of this conception. From external forces but half the result, at most, could ensue; the other half lies within the individual disposition of the living material, without which it is obvious the specific reaction-formation could never be achieved. This principle must be applied also in psychology. The psyche does not only *react*; it also gives its own individual reply to the influences at work upon it, and at least half the resulting configuration and its existing disposition is due to this. Civilisation is never, and again never, to be regarded as merely reaction to environment. That shallow explanation we may abandon peacefully to the past century. It is just these very dispositions which we must regard as imperative in the psychological sphere; it is easy to get convincing proof daily of their compulsive power. What I call "biological duty" is identical with these dispositions.

In conclusion, I must deal with a matter which seems to have caused you uneasiness, namely, the *moral* question. Among our patients we see many so-called immoral tendencies, therefore the thought involuntarily forces itself upon the psychotherapist as to how things would go if all these desires were to be gratified. You will have discerned already from my earlier letters that these desires must not be estimated too literally. As a rule it is rather a matter of unmeasured and exaggerated demands, arising out of the patient's stored-up libido, which have usurped a prominent position, usually quite against his own wish. In most cases the canalisation of the libido for the fulfilment of life's simple duties, suffices to reduce these exaggerated desires to zero. But in some cases it must be recognised that such "immoral" tendencies are in no way removed by analysis; on the contrary, they appear more often and more clearly, hence it becomes plain that they belong to the individual's biological duties. And this is particularly true of certain sexual claims, whose aim is an individual valuation of sexuality. This is not a question for pathology, it is a social question of to-day which peremptorily demands an ethical solution. For many it is a biological duty to work for the solution of this question, to discover some sort of practical solution. (Nature, it is well known, does not content herself with theories.) To-day we have no real sexual morality, only a legal attitude towards sexuality; just as the early Middle Ages had no genuine morality for financial transactions, but only prejudices and a legal standpoint. We are not yet sufficiently advanced in the domain of free sexual activity to distinguish between a moral and an immoral relationship. We have a clear expression of this in the customary treatment, or rather ill-treatment, of unmarried motherhood. For a great deal of sickening hypocrisy, for the high tide of prostitution, and for the prevalence of sexual diseases, we may thank both our barbarous, undifferentiated legal judgments about the sexual situation, and our inability to develop a finer moral perception of the immense psychologic differences that may exist in free sexual activity.

This reference to the existence of an exceedingly complicated and significant problem may suffice to explain why we by no means seldom meet with individuals among our patients who are quite specially called, because of their spiritual and social gifts, to take an active part in the work of civilisation—for this they are biologically destined. We must never forget that what to-day is deemed a moral law will to-morrow be cast into the melting-pot and transformed, so that in the near or distant future it may serve as the basis of a new ethical structure. This much we ought to have learnt from the history of civilisation, that the forms of morality belong to the category of transitory things. The finest psychological tact is required with these critical natures, so that the dangerous corners of infantile irresponsibility, indolence and uncontrolledness may be turned, and a pure, untroubled vision of the possibility of a moral autonomous activity made possible. Five per cent. on money lent is fair interest, twenty per cent. is despicable usury. That point of view we have to apply equally to the sexual situation.

So it comes about that there are many neurotics whose innermost delicacy of feeling prevents their being at one with present-day morality, and they cannot adapt themselves to civilisation as long as their moral code has gaps in it, the filling up of which is a crying need of the age. We deceive ourselves greatly if we suppose that many married women are neurotic only because they are unsatisfied sexually or because they have not found the right man, or because they still have a fixation to their infantile sexuality. The real ground of the neurosis is, in many cases, the inability to recognise the work that is waiting for them, of helping to

build up a new civilisation. We are all far too much at the standpoint of the "nothing-but" psychology; we persist in thinking we can squeeze the new future which is pressing in at the door into the framework of the old and the known. And thus the view is only of the present, never of the future. But it was of most profound psychological significance when Christianity first discovered, in the orientation towards the future, a redeeming principle for mankind. In the past nothing can be altered, and in the present little, but the future is ours and capable of raising life's intensity to its highest pitch. A little space of youth belongs to us, all the rest of life belongs to our children.

Thus does your question as to the significance of the loss of faith in authority answer itself. The neurotic is ill not because he has lost his old faith, but because he has not yet found a new form for his finest aspirations.

CHAPTER X

ON THE IMPORTANCE OF THE UNCONSCIOUS IN PSYCHOPATHOLOGY^[182]

When we speak of a thing as being "unconscious" we must not forget that from the point of view of the functioning of the brain a thing may be unconscious to us in two ways—physiologically or psychologically. I shall only deal with the subject from the latter point of view. So that for our purposes we may define the unconscious as "the sum of all those psychological events which are not apperceived, and so are unconscious."

The unconscious contains all those psychic events which, because of the lack of the necessary intensity of their functioning, are unable to pass the threshold which divides the conscious from the unconscious; so that they remain in effect below the surface of the conscious, and flit by in subliminal phantom forms.

It has been known to psychologists since the time of Leibniz that the elements—that is to say, the ideas and feelings which go to make up the conscious mind, the so-called conscious content—are of a complex nature, and rest upon far simpler and altogether unconscious elements; it is the combination of these which gives the element of consciousness. Leibniz has already mentioned the *perceptions insensibles*—those vague perceptions which Kant called "shadowy" representations, which could only attain to consciousness in an indirect manner. Later philosophers assigned the first place to the unconscious, as the foundation upon which the conscious was built.

But this is not the place to consider the many speculative theories nor the endless philosophical discussions concerning the nature and quality of the unconscious. We must be satisfied with the definition already given, which will prove quite sufficient for our purpose, namely the conception of the unconscious as the sum of all psychical processes below the threshold of consciousness.

The question of the importance of the unconscious for psychopathology may be briefly put as follows: "In what manner may we expect to find unconscious psychic material behave in cases of psychosis and neurosis?"

In order to get a better grasp of the situation in connexion with mental disorders, we may profitably consider first how unconscious psychic material behaves in the case of normal people, especially trying to visualize what in normal men is apt to be unconscious. As a preliminary to this knowledge we must get a complete understanding of what is contained in the conscious mind; and then, by a process of elimination we may expect to find what is contained in the unconscious, for obviously—*per exclusionem*—what is in the conscious cannot be unconscious. For this purpose we examine all activities, interests, passions, cares, and joys, which are conscious to the individual. All that we are thus able to discover becomes, *ipso facto*, of no further moment as a content of the unconscious, and we may then expect to

find only those things contained in the unconscious which we have not found in the conscious mind.

Let us take a concrete example: A merchant, who is happily married, father of two children, thorough and painstaking in his business affairs, and at the same time trying in a reasonable degree to improve his position in the world, carries himself with self-respect, is enlightened in religious matters, and even belongs to a society for the discussion of liberal ideas.

What can we reasonably consider to be the content of the unconscious in the case of such an individual?

Considered from the above theoretical standpoint, everything in the personality that is not contained in the conscious mind should be found in the unconscious. Let us agree, then, that this man consciously considers himself to possess all the fine attributes we have just described—no more, no less. Then it must obviously result that he is entirely unaware that a man may be not merely industrious, thorough, and painstaking, but that he may also be careless, indifferent, untrustworthy; for some of these last attributes are the common heritage of mankind and may be found to be an essential component of every character. This worthy merchant forgets that quite recently he allowed several letters to remain unanswered which he could easily have answered at once. He forgets, too, that he failed to bring a book home which his wife has asked him to get at the book-stall, where she had previously ordered it, although he might easily have made a note of her wish. But such occurrences are common with him. Therefore we are obliged to conclude that he is also lazy and untrustworthy. He is convinced that he is a thoroughly loyal subject; but for all that he failed to declare the whole of his income to the assessor, and when they raise his taxes, he votes for the Socialists.

He believes himself to be an independent thinker, yet a little while back he undertook a big deal on the Stock Exchange, and when he came to enter the details of the transaction in his books he noticed with considerable misgivings that it fell upon a Friday, the 13th of the month. Therefore, he is also superstitious and not free in his thinking.

So here we are not at all surprised to find these compensating vices to be an essential content of the unconscious. Obviously, therefore, the reverse is true—namely, that unconscious virtues compensate for conscious deficiencies. The law which ought to follow as the result of such deductions would appear to be quite simple—to wit, the conscious spendthrift is unconsciously a miser; the philanthropist is unconsciously an egoist and misanthrope. But, unfortunately, it is not quite so easy as that, although there is a basis of truth in this simple rule. For there are essential hereditary dispositions of a latent or manifest nature which upset the simple rule of compensation, and which vary greatly in individual cases. From entirely different motives a man may, for instance, be a philanthropist, but the manner of his philanthropy depends upon his originally inherited disposition, and the way in which the philanthropic attitude is compensated depends upon his motives. It is not sufficient simply to know that a certain person is philanthropic in order to diagnose an unconscious egoism. For we must also bring to such a diagnosis a careful study of the motives involved.

In the case of normal people the principal function of the unconscious is to effect a compensation and thus produce a balance. All extreme conscious tendencies are softened and toned down through an effective opposite impulse in the unconscious. This compensating agency, as I have tried to show in the case of the merchant, maintains itself through certain

unconscious, inconsequent activities, as it were, which Freud has very well described as symptomatic acts (*Symptom-handlungen*).

To Freud we owe thanks also for having called attention to the importance of dreams, for by means of them, also, we are able to learn much about this compensating function. There is a fine historical example of this in the well-known dream of Nebuchadnezzar in the fourth chapter of the Book of Daniel, where Nebuchadnezzar at the height of his power had a dream which foretold his downfall. He dreamed of a tree which had raised its head even up to heaven and now must be hewn down. This is a dream which is obviously a counterpoise to the exaggerated feeling of royal power.

Now considering states in which the mental balance is disturbed, we can easily see, from what has preceded, wherein lies the importance of the unconscious for psychopathology. Let us ponder the question of where and in what manner the unconscious manifests itself in abnormal mental conditions. The way in which the unconscious works is most clearly seen in disturbances of a psychogenic nature, such as hysteria, compulsion neurosis, etc.

We have known for a long time that certain symptoms of these disturbances are produced by unconscious psychic events. Just as clear, but less recognised, are the manifestations of the unconscious in actually insane patients. As the intuitive ideas of normal men do not spring from logical combinations of the conscious mind, so the hallucinations and delusions of the insane arise, not out of conscious but out of unconscious processes.

Formerly, when we held a more materialistic view of psychiatry we were inclined to believe that all delusions, hallucinations, stereotypic acts, etc., were provoked by morbid processes in the brain cells. Such a theory, however, ignores that delusions, hallucinations, etc., are also to be met with in certain functional disturbances, and not only in the case of functional disturbances, but also in the case of normal people. Primitive people may have visions and hear strange voices without having their mental processes at all disturbed. To seek to ascribe symptoms of that nature directly to a disease of the brain cells I hold to be superficial and unwarranted. Hallucinations show very plainly how a part of the unconscious content can force itself across the threshold of the conscious. The same is true of a delusion whose appearance is at once strange and unexpected by the patient.

The expression "mental balance" is no mere figure of speech, for its disturbance is a real disturbance of that equilibrium which actually exists between the unconscious and conscious content to a greater extent than has heretofore been recognised or understood. As a matter of fact, it amounts to this—that the normal functioning of the unconscious processes breaks through into the conscious mind in an abnormal manner, and thereby disturbs the adaptation of the individual to his environment.

If we study attentively the history of any such person coming under our observation, we shall often find that he has been living for a considerable time in a sort of peculiar individual isolation, more or less shut off from the world of reality. This constrained condition of aloofness may be traced back to certain innate or early acquired peculiarities, which show themselves in the events of his life. For instance, in the histories of those suffering from dementia præcox we often hear such a remark as this: "He was always of a pensive disposition, and much shut up in himself. After his mother died he cut himself off still more from the world, shunning his friends and acquaintances." Or again, we may hear, "Even as a

child he devised many peculiar inventions; and later, when he became an engineer, he occupied himself with most ambitious schemes."

Without discussing the matter further it must be plain that a counterpoise is produced in the unconscious as a compensation to the one-sidedness of the conscious attitude. In the first case we may expect to find an increasing pressing forward in the unconscious, of a wish for human intercourse, a longing for mother, friends, relatives; while in the second case self-criticism will try to establish a correcting balance. Among normal people a condition never arises so one-sided that the natural corrective tendencies of the unconscious entirely lose their value in the affairs of everyday life; but in the case of abnormal people, it is eminently characteristic that the individual entirely fails to recognise the compensating influences which arise in the unconscious. He even continues to accentuate his one-sidedness; this is in accord with the well-known psychological fact that the worst enemy of the wolf is the wolf-hound, the greatest despiser of the negro is the mulatto, and that the biggest fanatic is the convert; for I should be a fanatic were I to attack a thing outwardly which inwardly I am obliged to concede as right.

The mentally unbalanced man tries to defend himself against his own unconscious, that is to say, he battles against his own compensating influences. The man already dwelling in a sort of atmosphere of isolation, continues to remove himself further and further from the world of reality, and the ambitious engineer strives by increasingly morbid exaggerations of invention to disprove the correctness of his own compensating powers of self-criticism. As a result of this a condition of excitation is produced, from which results a great lack of harmony between the conscious and unconscious attitudes. The pairs of opposites are torn asunder, the resulting division or strife leads to disaster, for the unconscious soon begins to intrude itself violently upon the conscious processes. Then odd and peculiar thoughts and moods supervene, and not infrequently incipient forms of hallucination, which clearly bear the stamp of the internal conflict.

These corrective impulses or compensations which now break through into the conscious mind, should theoretically be the beginning of the healing process, because through them the previously isolated attitude should apparently be relieved. But in reality this does not result, for the reason that the unconscious corrective impulses which thus succeed in making themselves apparent to the conscious mind, do so in a form that is altogether unacceptable to consciousness.

The isolated individual begins to hear strange voices, which accuse him of murder and all sorts of crimes. These voices drive him to desperation and in the resulting agitation he attempts to get into contact with the surrounding *milieu*, and does what he formerly had anxiously avoided. The compensation, to be sure, is reached, but to the detriment of the individual.

The pathological inventor, who is unable to profit by his previous failures, by refusing to recognise the value of his own self-criticism, becomes the creator of still more preposterous designs. He wishes to accomplish the impossible but falls into the absurd. After a while he notices that people talk about him, make unfavourable remarks about him, and even scoff at him. He believes a far-reaching conspiracy exists to frustrate his discoveries and render them objects of ridicule. By this means his unconscious brings about the same results that his self-criticism could have attained, but again only to the detriment of the individual, because the criticism is projected into his surroundings.

An especially typical form of unconscious compensation—to give a further example—is the paranoia of the alcoholic. The alcoholic loses his love for his wife; the unconscious compensation tries to lead him back again to his duty, but only partially succeeds, for it causes him to become jealous of his wife as if he still loved her. As we know, he may even go so far as to kill both his wife and himself, merely out of jealousy. In other words, his love for his wife has not been entirely lost, it has simply become subliminal; but from the realm of the unconscious it can now only reappear in the form of jealousy.

We see something of a similar nature in the case of religious converts. One who turns from protestantism to catholicism has, as is well known, the tendency to be somewhat fanatical. His protestantism is not entirely relinquished, but has merely disappeared into the unconscious, where it is constantly at work as a counter-argument against the newly acquired catholicism. Therefore the new convert feels himself constrained to defend the faith he has adopted in a more or less fanatical way. It is exactly the same in the case of the paranoiac, who feels himself constantly constrained to defend himself against all external criticism, because his delusional system is too much threatened from within.

The strange manner in which these compensating influences break through into the conscious mind derives its peculiarities from the fact that they have to struggle against the resistances already existing in the conscious mind, and therefore present themselves to the patient's mind in a thoroughly distorted manner. And secondly, these compensating equivalents are obliged necessarily to present themselves in the language of the unconscious—that is, in material of a heterogeneous and subliminal nature. For all the material of the conscious mind which is of no further value, and can find no suitable employment, becomes subliminal, such as all those forgotten infantile and phantastic creations that have ever entered the heads of men, of which only the legends and myths still remain. For certain reasons which I cannot discuss further here, this latter material is frequently found in dementia præcox.

I hope I may have been able to give in this brief contribution, which I feel to be unfortunately incomplete, a glimpse of the situation as it presents itself to me of the importance of the unconscious in psychopathology. It would be impossible in a short discourse to give an adequate idea of all the work that has already been done in this field.

To sum up, I may say that the function of the unconscious in conditions of mental disturbance is essentially a compensation of the content of the conscious mind. But because of the characteristic condition of one-sidedness of the conscious striving in all such cases, the compensating correctives are rendered useless. It is, however, inevitable that these unconscious tendencies break through into the conscious mind, but in adapting themselves to the character of the one-sided conscious aims, it is only possible for them to appear in a distorted and unacceptable form.

CHAPTER XI

A CONTRIBUTION TO THE STUDY OF PSYCHOLOGICAL TYPES^[183]

It is well known that in their general physiognomy hysteria and dementia præcox present a striking contrast, which is seen particularly in the attitude of the sufferers towards the external world. The reactions provoked in the hysteric surpass the normal level of intensity of feeling, whilst this level is not reached at all by the precocious dement. The picture presented by these contrasted illnesses is one of exaggerated emotivity in the one, and extreme apathy in the other, with regard to the environment. In their personal relations this difference is very marked. Abstraction creates some exceptions here, for we remain in affective rapport with our hysterical patients, which is not the case in dementia præcox.

The opposition between these two nosological types is also seen in the rest of their symptomatology. From the intellectual point of view the products of hysterical imagination may be accounted for in a very natural and human way in each individual case by the antecedents and individual history of the patient; while the inventions of the precocious dement, on the contrary, are more nearly related to dreams than to normal consciousness, and they display moreover an incontestably archaic tendency, wherein mythological creations of primitive imagination are more in evidence than the personal memories of the patient. From the physical point of view we do not find in dementia præcox those symptoms so common in the hysteric, which simulate well known or severe organic affections.

All this clearly indicates that hysteria is characterised by a centrifugal tendency of the libido,^[184] whilst in dementia præcox its tendency is centripetal. The reverse occurs, however, where the illness has fully established its compensatory effects. In the hysteric the libido is always hampered in its movements of expansion and forced to regress upon itself; one observes that such individuals cease to partake in the common life, are

wrapped up in their phantasies, keep their beds, or are unable to live outside their sick-rooms, etc. The precocious dement, on the contrary, during the incubation of his illness turns away from the outer world in order to withdraw into himself; but when the period of morbid compensation arrives, he seems constrained to draw attention to himself, and to force himself upon the notice of those around him, by his extravagant, insupportable, or directly aggressive conduct.

I propose to use the terms "extroversion" and "introversion" to describe these two opposite directions of the libido, further qualifying them, however, as "regressive" in morbid cases where phantasies, fictions, or phantastic interpretations, inspired by emotivity, falsify the perceptions of the subject about things, or about himself. We say that he is extroverted when he gives his fundamental interest to the outer or objective world, and attributes an all-important and essential value to it: he is introverted, on the contrary, when the objective world suffers a sort of depreciation, or want of consideration, for the sake of the exaltation of the individual himself, who then monopolising all the interest, grows to believe no one but himself worthy of consideration. I will call "regressive extroversion" the phenomenon which Freud calls "transference" (Übertragung), by which the hysteric projects into the objective world the illusions, or subjective values of his feelings. In the same way I shall call "regressive introversion," the opposite pathological phenomenon which we find in dementia præcox, where the subject himself suffers these phantastical transfigurations.

It is obvious that these two contrary movements of the libido, as simple psychic mechanisms, may play a part alternately in the same individual, since after all they serve the same purpose by different methods—namely, to minister to his well-being. Freud has taught us that in the mechanism of hysterical transference the individual aims at getting rid of disagreeable memories or impressions, in order to free himself from painful complexes, by a process of "repression." Conversely in the mechanism of introversion, the personality tends to concentrate itself upon its complexes, and with them, to isolate itself from external reality, by a process which is not properly speaking "repression," but which would be better rendered perhaps by the term "depreciation" (Entwertung) of the objective world.

The existence of two mental affections so opposite in character as hysteria and dementia præcox, in which the contrast rests on the almost exclusive

supremacy of extroversion or introversion, suggests that these two psychological types may exist equally well in normal persons, who may be characterised by the relative predominance of one or other of the two mechanisms. Psychiatrists know very well that before either illness is fully declared, patients already present the characteristic type, traces of which are to be found from the earliest years of life. As Binet pointed out so well, the neurotic only accentuates and shews in relief the characteristic traits of his personality. One knows, of course, that the hysterical character is not simply the product of the illness, but pre-existed it in a measure. And Hoch has shown by his researches into the histories of his dementia præcox patients, that this is also the case with them; dissociations or eccentricities were present before the onset of the illness. If this is so, one may certainly expect to meet the same contrast between psychological temperaments outside the sphere of pathology. It is moreover easy to cull from literature numerous examples which bear witness to the actual existence of these two opposite types of mentality. Without pretending to exhaust the subject, I will give a few striking examples.

In my opinion, we owe the best observations on this subject to the philosophy of William James.^[185] He lays down the principle that no matter what may be the temperament of a "professional philosopher," it is this temperament which he feels himself forced to express and to justify in his philosophy. And starting from this idea, which is altogether in accord with the spirit of psychoanalysis, divides philosophers into two classes: the "tender-minded," who are only interested in the inner life and spiritual things; and the "tough-minded," who lay most stress on material things and objective reality. We see that these two classes are actuated by exactly opposite tendencies of the libido: the "tender-minded" represent introversion, the "tough-minded" extroversion.

James says that the tender-minded are characterised by rationalism; they are men of principles and of systems, they aspire to dominate experience and to transcend it by abstract reasoning, by their logical deductions, and purely rational conceptions. They care little for facts, and the multiplicity of phenomena hardly embarrasses them at all: they forcibly fit data into their ideal constructions, and reduce everything to their *a priori* premises. This was the method of Hegel in settling beforehand the number of the planets. In the domain of mental pathology we again meet this kind of philosopher

in paranoiacs, who, without being disquieted by the flat contradictions presented by experience, impose their delirious conceptions on the universe, and find means of interpreting everything, and according to Adler "arranging" everything, in conformity with their morbidly preconceived system.

The other traits which James depicts in this type follow naturally from its fundamental character. The tender-minded man, he says, is intellectual, idealist, optimist, religious, partisan of free-will, a monist, and a dogmatist. All these qualities betray the almost exclusive concentration of the libido upon the intellectual life. This concentration upon the inner world of thought is nothing else than introversion. In so far as experience plays a *rôle* with these philosophers, it serves only as an allurement or fillip to abstraction, in response to the imperative need to fit forcibly all the chaos of the universe within well-defined limits, which are, in the last resort, the creation of a spirit obedient to its subjective values.

The tough-minded man is positivist and empiricist. He regards only matters of fact. Experience is his master, his exclusive guide and inspiration. It is only empirical phenomena demonstrable in the outside world which count. Thought is merely a reaction to external experience. In the eyes of these philosophers principles are never of such value as facts; they can only reflect and describe the sequence of phenomena and cannot construct a system. Thus their theories are exposed to contradiction under the overwhelming accumulation of empirical material. Psychic reality for the positivist limits itself to the observation and experience of pleasure and pain; he does not go beyond that, nor does he recognise the rights of philosophical thought. Remaining on the ever-changing surface of the phenomenal world, he partakes himself of its instability; carried away in the chaotic tumult of the universe, he sees all its aspects, all its theoretical and practical possibilities, but he never arrives at the unity or the fixity of a settled system, which alone could satisfy the idealist or tender-minded. The positivist depreciates all values in reducing them to elements lower than themselves; he explains the higher by the lower, and dethrones it, by showing that it is "nothing but such another thing," which has no value in itself.

From these general characteristics, the others which James points out logically follow. The positivist is a sensualist, giving greater value to the

specific realm of the senses than to reflection which transcends it. He is a materialist and a pessimist, for he knows only too well the hopeless uncertainty of the course of things. He is irreligious, not being in a state to hold firmly to the realities of the inner world as opposed to the pressure of external facts; he is a determinist and fatalist, only able to show resignation; a pluralist, incapable of all synthesis; and finally a sceptic, as a last and inevitable consequence of all the rest.

The expressions, therefore, used by James, show clearly that the diversity of types is the result of a different localisation of the libido; this libido is the magic power in the depth of our being, which, following the personality, carries it sometimes towards internal life, and sometimes towards the objective world. James compares, for example, the religious subjectivism of the idealist, and the quasi-religious attitude of the contemporary empiricist: "Our esteem for facts has not neutralised in us all religiousness. It is itself almost religious. Our scientific temper is devout."^[186]

A second parallel is furnished by Wilhelm Ostwald,^[187] who divides "savants" and men of genius into classics and romantics. The latter are distinguished by their rapid reactions, their extremely prompt and abundant production of ideas and projects, some of which are badly digested and of doubtful value. They are admirable and brilliant masters, loving to teach, of a contagious ardour and enthusiasm, which attracts many pupils, and makes them founders of schools, exercising great personal influence. Herein our type of extroversion is easily recognised. The classics of Ostwald are, on the contrary, slow to react; they produce with much difficulty, are little capable of teaching or of exercising direct personal influence, and lacking enthusiasm are paralysed by their own severe criticism, living apart and absorbed in themselves, making scarcely any disciples, but producing works of finished perfection which often bring them posthumous fame. All these characteristics correspond to introversion.

We find a further very valuable example in the æsthetic theory of Warringer. Borrowing from A. Riegl his expression "Volonté d'art absolue" to express the internal force which inspires the artist, he distinguishes two forms, viz. sympathy (Einfühlung) and abstraction; and the term which he employs indicates that here, too, we witness the activity of the push of the libido, the stirring of the *élan vital*. "In the same way," says Warringer, "as the

sympathetic impulse finds its satisfaction in organic beauty, so abstract impulse discovers beauty in the inorganic, which is the negation of all life, in crystallised forms, and in a general manner wherever the severity of abstract law reigns." Whilst sympathy represents the warmth of passion which carries it into the presence of the object in order to assimilate it and penetrate it with emotional values; abstraction, on the other hand, despoils the object of all that could recall life, and grasps it by purely intellectual thought, crystallised and fixed into the rigid forms of law,—the universal, the typical. Bergson also makes use of these images of crystallisation, solidification, etc., to illustrate the essence of intellectual abstraction.

Warringer's "abstraction" represents the process which I have already remarked as a consequence of introversion, namely, the exaltation of the intellect, in the place of the depreciated reality of the external world. "Sympathy" corresponds in fact to extroversion, for, as Lipps has pointed out, "What I perceive sympathetically in an object is, in a general manner life, and life is power, internal work, effort, and execution. To live, in a word, is to act, and to act is to experience intimately the force which we give out; experience creates activity, which is essentially of a spontaneous character." "Æsthetic enjoyment," said Warringer, "is the enjoyment of one's own self projected into the "object," a formula which corresponds absolutely with our definition of transference. This æsthetic conception does not refer to the positivist in James's sense; it is rather the attitude of the idealist for whom psychological reality only is interesting, and worthy of consideration." Warringer adds, "what is essential lies not in the gradation of the feeling, but pre-eminently in the feeling itself; that is to say, the inner movement, the intimate life, the unfolding of the subject's own activity; the value of a line or of a form, depends in our eyes on the biological value it holds for us; that which gives beauty is solely our own vital feeling, which we unconsciously project into it." This view corresponds exactly with my own way of understanding the theory of the libido, in attempting to keep the true balance between the two psychological opposites of introversion and extroversion.

The polar opposite of sympathy is abstraction. The impulse of abstraction is conceived by Warringer "as the result of a great internal conflict of the human soul in the presence of the external world, and from the religious standpoint, it corresponds to a strong transcendental colouring of all the

representations man has made to himself of reality." We recognise clearly in this definition the primordial tendency to introversion. To the introverted type the universe does not appear beautiful and desirable, but disquieting, and even dangerous; it is a manifestation against which the subject puts himself on the defensive; he entrenches himself in his inner fastness, and fortifies himself therein by the invention of geometrical figures, full of repose, perfectly clear even in their minutest details, the primitive magic power of which assures him of domination over the surrounding world.

"The need of abstraction is the origin of all art," says Warringer. Here is a great principle, which gains weighty confirmation from the fact that precocious demented reproduce forms and figures which present the closest analogy to those of primitive humanity, not only in their thoughts but also in their drawings.

We should recall that Schiller had already tried to formulate the same presentation in what he calls the naïve and sentimental types. The latter is in quest of nature, whilst the former is itself "all nature." Schiller also saw that these two types result from the predominance of psychological mechanisms which might be met with in one and the same individual. "It is not only in the same poet," he said, "but even in the same work that these two types of mentality are found united.... The naïve poet pursues only nature and feeling in their simplicity, and all his effort is limited to the imitation and reproduction of reality. The sentimental poet, on the contrary, reflects the impression he receives from objects. The object here is allied to an idea, and the poetic power of the work depends on this alliance." These quotations shew what types Schiller had in view, and one recognises their fundamental identity with those with which we are here dealing.

We find another instance in Nietzsche's contrast between the minds of Apollo and of Dionysus. The example which Nietzsche uses to illustrate this contrast is instructive—namely, that between a dream and intoxication. In a dream the individual is shut up in himself, in intoxication, on the contrary, he forgets himself to the highest degree, and, set free from his self-consciousness, plunges into the multiplicity of the objective world. To depict Apollo, Nietzsche borrows the words of Schopenhauer, "As upon a tumultuous sea, which disgorges and swallows by turns, lost to view in the mountains of foaming waves, the mariner remains seated tranquilly on his plank, full of confidence in his frail barque; so individual man, in a world of

troubles, lives passive and serene, relying with confidence on the principle of 'individuation.'" "Yes," continues Nietzsche, "we might say that the unshakeable confidence in this principle, and the calm security of those whom it has inspired, have found in Apollo their most sublime expression, and we may always recognise in him the most splendid and divine personification of the principle of making an individual." The Apollonian state, as Nietzsche conceives it, is consequently the withdrawal into oneself, that is, introversion. Conversely in the Dionysian state, psychic intoxication, indicates in his view the unloosening of a torrent of libido which expends itself upon things. "This is not only," says Nietzsche, "the alliance of man with man, which finds itself confirmed afresh under the Dionysian enchantment; it is alienated Nature, hostile or enslaved, which also celebrates her reconciliation with her prodigal child,—man. Spontaneously Earth offers her gifts and the wild beasts from rock and desert draw near peacefully. The car of Dionysus is lost under flowers and garlands; panthers and tigers approach under his yoke."

If we change Beethoven's "Hymn of Praise" into a picture, and giving rein to our imagination, contemplate the millions of beings prostrated and trembling in the dust, at such a moment the Dionysian intoxication will be near at hand. Then is the slave free; then all the rigid and hostile barriers which poverty and arbitrary or insolent custom have established between man and man are broken down. Now, by means of this gospel of universal harmony, each feels himself not only reunited, reconciled, fused with his neighbour, but actually identified with him, as if the veil of "Maïa was torn away, nothing remaining of it but a few shreds floating before the mystery of the Primordial Unity."^[188] It would be superfluous to add comment to these quotations.

In concluding this series of examples culled outside my own special domain, I will quote the linguistic hypothesis of Finck,^[189] where we also see the duality in question. The structure of language, according to Finck, presents two principal types: in one the subject is generally conceived as active: "I see him," "I strike him down;" in the other the subject experiences and feels, and it is the object which acts: "He appears to me," "He succumbs to me." The first type clearly shews the libido as going out of the subject,—this is a centrifugal movement; the second as coming out of the object,—

this movement is centripetal. We meet with this latter introverted type especially in the primitive languages of the Esquimaux.

In the domain of psychiatry also these two types have been described by Otto Gross,^[190] who distinguishes two forms of mental debility: the one a diffuse and shallow consciousness, the other a concentrated and deep consciousness. The first is characterised by weakness of the consecutive function, the second by its excessive reinforcement. Gross has recognised that the consecutive function is in intimate relation with affectivity, from which we might infer that he is dealing once more with our two psychological types. The relation he establishes between maniac depressive insanity and the state of diffuse or extended and shallow mental disease shows that the latter represents the extroverted type; and the relation between the psychology of the paranoiac and repressed mentality, indicates the identity of the former with the introverted type.

After the foregoing considerations no one will be astonished to find that in the domain of psychoanalysis we also have to reckon with the existence of these two psychological types.

On the one side we meet with a theory which is essentially reductive, pluralist, causal and sensualist; this is Freud's standpoint. This theory limits itself rigidly to empirical facts, and traces back complexes to their antecedents and their elemental factors. It regards the psychological life as being only an effect, a reaction to the environment, and accords the greatest *rôle* and the largest place to sensation. On the other side we have the diametrically opposed theory of Adler^[191] which is an entirely philosophical and finalistic one. In it phenomena are not reducible to earlier and very primitive factors, but are conceived as "arrangements," the outcome of intentions and of ends of an extremely complex nature. It is no longer the view of causality but of finality which dominates researches: the history of the patient and the concrete influences of the environment are of much less importance than the dominating principles, the "fictions directrices," of the individual. It is not essential for him to depend upon the object, and to find in it his fill of subjective enjoyment, but to protect his own individuality and to guarantee it against the hostile influences of the environment.

Whilst Freud's psychology has for its predominant note the centrifugal tendency, which demands its happiness and satisfaction in the objective world, in that of Adler the chief *rôle* belongs to the centripetal movement, which tends to the supremacy of the subject, to his triumph and his liberty, as opposed to the overwhelming forces of existence. The expedient to which the type described by Freud has recourse is "infantile transference," by means of which he projects phantasy into the object and finds a compensation for the difficulties of life in this transfiguration. In the type described by Adler what is characteristic is, on the contrary, the "virile protest," personal resistance, the efficacious safeguard which the individual provides for himself, in affirming and stubbornly enclosing himself in his dominating ideas.

The difficult task of elaborating a psychology which should pay equal attention to the two types of mentality belongs to the future.

CHAPTER XII

THE PSYCHOLOGY OF DREAMS^[192]

A dream is a psychic structure which at first sight appears to be in striking contrast with conscious thought, because judging by its form and substance it apparently does not lie within the continuity of development of the conscious contents, it is not integral to it, but is a mere external and apparently accidental occurrence. Its mode of genesis is in itself sufficient to isolate a dream from the other contents of the conscious, for it is a survival of a peculiar psychic activity which takes place during sleep, and does not originate in the manifest and clearly logical and emotional continuity of the event experienced.

But a careful observer should have no difficulty in discovering that a dream is not entirely severed from the continuity of the conscious, for in almost every dream certain details are found which have their origin in the impressions, thoughts, or states of mind of one of the preceding days. In so far a certain continuity does exist, albeit a *retrograde* one. But any one keenly interested in the dream problem cannot have failed to observe that a dream has also a *progressive* continuity—if such an expression be permitted—since dreams occasionally exert a remarkable influence upon the conscious mental life, even of persons who cannot be considered superstitious or particularly abnormal. These occasional after-effects are usually seen in a more or less distinct change in the dreamer's frame of mind.

It is probably in consequence of this loose connection with the other conscious contents, that the recollected dream is so extremely unstable. Many dreams baffle all attempts at reproduction, even immediately after waking; others can only be remembered with doubtful accuracy, and comparatively few can be termed really distinct and clearly reproduceable. This peculiar reaction with regard to recollection may be understood by considering the characteristics of the various elements combined in a dream. The combination of ideas in dreams is essentially *phantastic*; they

are linked together in a sequence which, as a rule, is quite foreign to our current way of thinking, and in striking contrast to the logical sequence of ideas which we consider to be a special characteristic of conscious mental processes.

It is to this characteristic that dreams owe the common epithet of "meaningless." Before pronouncing this verdict, we must reflect that dreams and their chains of ideas are something that *we* do not understand. Such a verdict would therefore be merely a projection of our non-comprehension upon its object. But that would not prevent its own peculiar meaning being inherent in a dream.

In spite of the fact that for centuries endeavours have been made to extract a prophetic meaning from dreams, Freud's discovery is practically the first successful attempt to find their real significance. His work merits the term "scientific," because he has evolved a technique which, not only he, but many other investigators also assert achieves its object, namely, the understanding of the meaning of the dream. This meaning is not identical with the one which the manifest dream content seems to indicate.

This is not the place for a critical discussion of Freud's psychology of dreams. But I will try to give a brief summary of what may be regarded as more or less established facts of dream psychology to-day.

The first question we must discuss is, whence do we deduce the justification for attributing to dreams any other significance than the one indicated in the unsatisfying fragmentary meaning of the manifest dream content?

As regards this point a particularly weighty argument is the fact that Freud discovered the hidden meaning of dreams by *empiric* and not *deductive* methods. A further argument in favour of a possible hidden, as opposed to the manifest meaning of dreams, is obtained by comparing dream-phantasies with other phantasies (day-dreams and the like) in one and the same individual. It is not difficult to conceive that such day-phantasies have not merely a superficial, concrete meaning, but also a deeper psychological meaning. It is solely on account of the brevity that I must impose upon myself, that I do not submit materials in proof of this. But I should like to point out that what may be said about the meaning of phantasies, is well illustrated by an old and widely diffused type of imaginative story, of which

Æsop's Fables are typical examples, wherein, for instance, the story is some objectively impossible phantasy about the deeds of a lion and an ass. The concrete superficial meaning of the fable is an impossible phantasm, but the hidden moral meaning is plain upon reflection. It is characteristic that children are pleased and satisfied with the exoteric meaning of the story. However, the best argument for the existence of a hidden meaning in dreams is provided by conscientious application of the technical procedure to solve the manifest dream content.

This brings us to our second main point, viz.—the question of analytic procedure. Here again I desire neither to defend nor to criticise Freud's views and discoveries, but rather to confine myself to what seem to me to be firmly established facts.

The fact that a dream is a psychic structure, does not give us the slightest ground for assuming that it obeys laws and designs other than those applicable to any other psychic structure. According to the maxim: *principia explicandi præter necessitatem non sunt multiplicanda*, we have to treat dreams, in analysis, just as any other psychic structure, until experience teaches us some better way.

We know that every psychic construction considered from the standpoint of causality, is the resultant of previous psychic contents. Moreover, we know also that every psychic structure, considered from the standpoint of finality, has its own peculiar meaning and purpose in the actual psychic process. This standard must also be applied to dreams. When, therefore, we seek a psychological explanation of a dream, we must first know what were the preceding experiences out of which it is combined. We must trace the antecedents of every element in the dream picture. For example: some one dreams "*that he is walking in a street, a child is running in front of him, who is suddenly run over by a motor-car.*" We will trace the antecedents of this dream-picture, with the aid of the dreamer's recollections.

He recognises the street as one down which he had walked on the previous day. The child he acknowledges as his brother's child, whom he had seen on the previous evening when visiting his brother. The motor accident reminds him of an accident that had actually occurred a few days before, but of which he had only read an account in a newspaper. Popular opinion is

known to be satisfied with this kind of explanation. People say: "Oh, that is why I dreamt such and such a thing!"

Obviously this explanation is absolutely unsatisfactory from a scientific standpoint. The dreamer walked down many streets on the previous day; why was this particular one selected? He had read about several accidents; why did he select just this one? The mere disclosure of an antecedent is by no means sufficient; for a plausible determination of the dream presentation can only be obtained from the competition of various determinants. The collection of additional material proceeds, according to the principle of recollection that has been called the *Association Method*. The result, as will easily be understood, is the admission of a mass of multifarious and quite heterogeneous material, having apparently nothing in common but the fact of its evident associative connection with the dream contents, since it has been reproduced by means of this content.

How far the collection of such material should go, is an important question from the technical point of view. Since the entire psychic content of a life may be ultimately disclosed from any single starting point, theoretically the whole previous life-experience might be found in every dream. But we only need to assemble just so much material as is absolutely necessary in order to comprehend the dream's meaning. The limitation of the material is obviously an arbitrary proceeding, according to that principle of Kant's whereby to *comprehend* is "*to perceive to the extent necessary for our purpose.*" For instance, when undertaking a survey of the causes of the French Revolution, we could, in amassing our material, include not only the history of medieval France but also that of Rome and Greece, which certainly would not be "necessary for our purpose," since we can comprehend the historical genesis of the Revolution from much more limited material.

Except for the aforesaid arbitrary limitation, the collecting of material lies outside the investigator's discretion. The material gathered must now be sifted and examined, according to principles which are always applied to the examination of historical or any empirical scientific material. The method is an essentially comparative one, that obviously cannot be applied automatically, but is largely dependent upon the skill and aim of the investigator.

When a psychological fact has to be explained, it must be remembered that psychological data necessitate a twofold point of view, namely, that of *causality* and that of *finality*. I use the word finality intentionally, in order to avoid confusion with the idea of "teleology." I use finality to denote immanent psychological teleology. In so far as we apply the view point of causality to the material that has been associated with the dream, we reduce the manifest dream content to certain fundamental tendencies or ideas. These, as one would expect, are elementary and universal in character.

For instance, a young patient dreams as follows: "*I am standing in a strange garden, and pluck an apple from a tree. I look about cautiously, to make sure no one sees me.*"

The associated dream material is a memory of having once, when a boy, plucked a couple of pears surreptitiously from another person's garden.

The feeling of having a bad conscience, which is a prominent feature in the dream, reminds him of a situation he experienced on the previous day. He met a young lady in the street—a casual acquaintance—and exchanged a few words with her. At that moment a gentleman passed whom he knew, whereupon our patient was suddenly seized with a curious feeling of embarrassment, as if he had done something wrong. He associated the apple with the scene in Paradise, together with the fact that he had never really understood why the eating of the forbidden fruit should have been fraught with such dire consequences for our first parents. This had always made him feel angry; it seemed to him an unjust act of God, for God had made men as they were, with all their curiosity and greed.

Another association was, that sometimes his father had punished him for certain things in a way that seemed to him incomprehensible. The worst punishment had been bestowed after he had secretly watched girls bathing.

That led up to the confession that he had recently begun a love affair with a housemaid, but had not yet carried it through to a conclusion. On the day before the dream he had had a *rendezvous* with her.

Upon reviewing this material we see that the dream contains a very transparent reference to the last-named incident. The connecting associative material shows that the apple episode is palpably meant for an erotic scene. For various other reasons, too, it may be considered extremely probable that

this experience of the previous day is operative even in this dream. In the dream the young man plucks the apple of Paradise, which in reality he has not yet plucked. The remainder of the material associated with the dream is concerned with another experience of the previous day, namely, with the peculiar feeling of a *bad conscience*, which seized the dreamer when he was talking to his casual lady acquaintance; this, again, was connected with the fall of man in Paradise, and finally with an erotic misdemeanour of his childhood, for which his father had punished him severely. All these associations are linked together by the idea of *guilt*.

In the first place we will consider this material from Freud's view-point of causality; in other words, we will "interpret" it, to use Freud's expression. A wish has been left unfulfilled from the day before the dream. In the dream this wish is realised in the *symbolical* apple scene. But why is this realisation disguised and hidden under a symbolic image instead of being expressed in a distinctly sexual thought? Freud would refer to the unmistakable sense of guilt shown up by the material, and say the morality that has been inculcated in the young man from childhood is bent on repressing such wishes, and to that end brands the natural craving as immoral and reprehensible. The suppressed immoral thought can therefore only achieve expression by means of a *symbol*. As these thoughts are incompatible with the moral content of the conscious ego, a psychic factor adopted by Freud called the *Censor*, prevents this wish from passing undisguised into consciousness.

Reviewing the dream from the standpoint of finality, which I contrast with that of Freud, does not—as I wish to establish explicitly—involve a denial of the dream's *causæ*, but rather a different interpretation of the associative material collected around the dream. The material facts remain the same, but the standard by which they are measured is altered. The question may be formulated simply as follows: What is this dream's purpose? What should it effect? These questions are not arbitrary, in as much as they may be applied to every psychic activity. Everywhere the question of the "why" and "wherefore" may be raised.

It is clear that the material added by the dream to the previous day's erotic experience, chiefly emphasises the sense of guilt in the erotic act. The same association has already been shown to be operative in another experience of the previous day, in the meeting with his casual lady acquaintance, when

the feeling of a bad conscience was automatically and inexplicably aroused, as if, in that instance, too, the young man had done something wrong. This experience also plays a part in the dream, which is even intensified by the association of additional, appropriate material; the erotic experience of the day before, being depicted by the story of the Fall which was followed by such a severe punishment.

I maintain that there exists in the dreamer an unconscious propensity or *tendency to conceive his erotic experiences as guilty*. It is most characteristic that the association with the Fall of Man should ensue, the young man having never really grasped why the punishment should have been so drastic. This association throws light upon the reasons why the dreamer did not think simply, "I am doing what is not right." Obviously he does not *know* that he might condemn his own conduct as morally wrong. This is actually the case. His conscious belief is that his conduct does not matter in the least morally, as all his friends were acting in the same way; besides, for other reasons too, is unable to understand why a fuss should be made about it.

Whether this dream should be considered full or void of meaning depends upon a very important question, viz. whether the standpoint of morality, handed down to us through the ages by our forefathers is held to be full or void of meaning. I do not wish to wander off into a philosophical discussion of this question, but would merely observe that mankind must obviously have had very strong reasons for devising this morality, otherwise it would be truly incomprehensible why such restraints should be imposed upon one of man's strongest cravings. If we attach due value to this fact, we are bound to pronounce this dream to be full of meaning, for it reveals to the young man the necessity of facing his erotic conduct boldly from the view point of morality. Primitive races have in some respects extremely strict legislation concerning sexuality. This fact proves that sexual morality is a not-to-be-neglected factor in the soul's higher functions, but deserves to be taken fully into account. In the case in question it should be added, that the young man—influenced by his friends' example—somewhat thoughtlessly let himself be guided exclusively by his erotic cravings, unmindful of the fact that man is a morally responsible being and must perforce submit—voluntarily or involuntarily—to a morality that he himself has created.

In this dream we can discern a compensating function of the unconscious, consisting in the fact that *those thoughts, propensities, and tendencies of a human personality, which in conscious life are too seldom recognised, come spontaneously into action in the sleeping state, when to a large extent the conscious process is disconnected.*

The question might certainly be raised, of what use is this to the dreamer if he does not understand the dream?

To this I must remark that to understand is not an exclusively intellectual process, for—as experience proves—man may be influenced—nay, even very effectually convinced—by innumerable things, of which he has no intellectual understanding. I will merely remind my readers of the efficacy of religious symbols.

The example given above might suggest the thought that the function of dreams is a distinctly "moral" one. Such it appears to be in this case, but if we recall the formula according to which dreams contain the subliminal materials of a given moment, we cannot speak simply of a "moral" function. For it is worthy of note that the dreams of those persons whose actions are morally unexceptionable, bring materials to light that might well be characterised as "immoral" in the current meaning of that term. Thus it is significant that St. Augustine was glad that God did not hold him responsible for his dreams. The unconscious is the unknown of a given moment, therefore it is not surprising that all those aspects that are essential for a totally different point of view should be added by dreams to the conscious psychological factors of a given moment. It is evident that this function of dreams signifies a psychological adjustment, a compensation essential for properly balanced action. In the conscious process of reflection it is indispensable that, so far as possible, we should realise all the aspects and consequences of a problem, in order to find the right solution. This process is continued automatically in the more or less unconscious state of sleep, wherever—as our previous experience seems to show—all those other points of view occur to the dreamer (at least by way of allusion) that during the day were underestimated or even totally ignored; in other words, were comparatively unconscious.

As regards the much-discussed *symbolism* of dreams, the value attached to it varies according to whether the standpoint of causality or of finality is

adopted. According to Freud's causal view point it proceeds from a *craving*, viz. from the suppressed dream-wish. This craving is always somewhat simple and primitive, and is able to disguise itself under manifold forms. For instance, the young man in question might just as well have dreamt that he had to open a door with a key, or that he had to travel by aeroplane, or that he was kissing his mother, etc. From this standpoint all those things would have had the same meaning. In this way, the typical adherents of Freud's school have come to the point of interpreting—to give a gross instance—almost all long objects in dreams as phallic symbols.

From the view-point of finality, the various dream pictures have each their own peculiar value. For instance, if the young man, instead of dreaming of the apple scene, had dreamt he had to open a door with a key, the altered dream picture would have furnished associative material of an essentially different character; that, again, would have resulted in the conscious situation being supplemented by associations of a totally different kind from those connected with the apple scene. From this point of view, it is the diversity of the dream's mode of expression that is full of meaning, and not the uniformity in its significance. The causal view-point tends by its very nature towards uniformity of meaning, that is, towards a fixed significance of symbols. On the other hand, the final view-point perceives in an altered dream picture, the expression of an altered psychological situation. It recognises no fixed meaning of symbols. From this standpoint all the dream pictures are important in themselves, each one having a special significance of its own, to which it owes its inclusion in the dream. Keeping to our previous example, we see that from the standpoint of finality the symbol in this dream is approximately equivalent to a parable; it does not conceal, but it teaches. The apple scene recalls vividly the sense of guilt, at the same time disguising the real deed of our first parents.

It is obvious we reach very dissimilar interpretations of the meaning of the dream, according to the point of view adopted. The question now arises, which is the better or truer version? After all, for us therapists it is a practical and not a merely theoretical necessity that leads us to seek for some comprehension of the meaning of dreams. In treating our patients we must for practical reasons endeavour to lay hold of any means that will enable us to train them effectually. It should be quite evident from the foregoing example, that the material associated with the dream has opened

up a question calculated to make many matters clear to the young man, which, hitherto, he has heedlessly overlooked. But by disregarding these things he was really overlooking something in himself, for he possesses a moral standard and a moral need just like any other man. By trying to live without taking this fact into consideration, his life is one-sided and incomplete, so to say inco-ordinate; with the same consequences for the psychological life as a one-sided and incomplete diet would have for the physical. In order to develop a person's individuality and independence to the uttermost, we need to bring to fruition all those functions that have hitherto attained but little conscious development or none at all. In order to achieve this aim, we must for therapeutic reasons enter into all those unconscious aspects of things brought forward by the dream material. This makes it abundantly clear that the view-point of finality is singularly important as an aid to the practical development of the individual.

The view-point of causality is obviously more in accord with the scientific spirit of our time, with its strictly causalistic reasoning. Much may be said for Freud's view as a scientific explanation of dream psychology. But I must dispute its completeness, for the psyche cannot be conceived merely from the causal aspect, but necessitates also a final view-point. Only a combination of both points of view—which has not yet been attained to the satisfaction of the scientific mind, owing to great difficulties both of a practical and theoretical nature—can give us a more complete conception of the essence of dreams.

I would like to treat briefly of some further problems of dream psychology, that border on the general discussion of dreams. Firstly, as to the *classification of dreams*; I do not wish to overestimate either the practical or theoretical significance of this question. I investigate yearly some 1500-2000 dreams, and this experience enables me to state that typical dreams actually do exist. But they are not very frequent, and from the view-point of finality they lose much of the importance which attaches to them as a result of the fixed significance of symbols according to the causal view-point. It seems to me that the *typical themes* of dreams are of far greater importance, for they permit of a comparison with the themes of mythology. Many of these mythological themes—in the study of which Frobenius has rendered notable service—are also found in dreams, often with precisely the same

significance. Unfortunately the limited time at my disposal, does not permit me to lay detailed materials before you: this has been done elsewhere.^[193] But I desire to emphasise the fact that the comparison of the typical themes of dreams with those of mythology obviously suggests the idea (already put forward by Nietzsche) that from a phylogenetic point of view dream-thought should be conceived as an older form of thought. Instead of multiplying examples in explanation of my meaning, I will briefly refer you to our specimen dream. As you remember, that dream introduced the apple scene as a typical representation of erotic guilt. The gist of its purport is: "I am doing wrong in acting like this." But it is characteristic that a dream never expresses itself in a logically abstract way, but always in the language of parable or simile. This peculiarity is also a characteristic feature of primitive languages, whose flowery idioms always strike us. If you call to mind the writings of ancient literature—*e.g.* the language of simile in the Bible—you will find that what nowadays is expressed by means of abstract expressions, could then only be expressed by means of simile. Even such a philosopher as Plato did not disdain to express certain fundamental ideas by means of concrete simile.

Just as the body bears traces of its phylogenetic development, so also does the human mind. There is therefore nothing surprising in the possibility of the allegories of our dreams being a survival of archaic modes of thought.

The theft of the apple in our example is a typical theme of dreams, often recurring with various modifications. It is also a well-known theme in mythology, and is found not only in the story of the Garden of Eden, but in numerous myths and fables of all ages and climes. It is one of those universally human symbols, which can reappear in any one, at any time. Thus, dream psychology opens up a way to a general comparative psychology, from which we hope to attain the same sort of understanding of the development and structure of the human soul, as comparative anatomy has given us concerning the human body.

CHAPTER XIII

THE CONTENT OF THE PSYCHOSES^[194]

INTRODUCTION

My short sketch on the Content of the Psychoses which first appeared in the series of "Schriften zur Angewandten Seelenkunde" under Freud's editorship was designed to give the non-professional but interested public some insight into the psychological point of view of recent psychiatry. I chose by way of example a case of the mental disorder known as Dementia Præcox, which Bleuler calls Schizophrenia. Statistically this extensive group contains by far the largest number of cases of psychosis. Many psychiatrists would prefer to limit it, and accordingly make use of other nomenclature and classification. From the psychological standpoint the change of name is unimportant, for it is of less value to know what a thing is called than to know what it is. The cases of mental disorder sketched in this essay belong to well-known and frequently occurring types, familiar to the alienist. The facts will not be altered if these disorders are called by some other name than dementia præcox.

I have presented my view of the psychological basis in a work^[195] whose scientific validity has been contested upon all sorts of grounds. For me it is sufficient justification that a psychiatrist of Bleuler's standing has fully accepted, in his great monograph on the disease, all the essential points in my work. The difference between us is as to the question whether, in relation to the anatomical basis, the psychological disorders should be regarded as primary or secondary. The resolution of this weighty question depends upon the general problem as to whether the prevailing dogma in psychiatry—"disorders of the mind are disorders of the brain"—presents a final truth or not. This dogma leads to absolute sterility as soon as universal validity is ascribed to it. There are undoubted psychogenic mental diseases (the so-called hysterical) which are properly regarded as *functional* in

contrast with organic diseases which rest upon demonstrable anatomical changes. Disorders of the brain should only be called organic when the psychic symptoms depend upon an undoubtedly primary disease of the brain. Now in dementia præcox this is by no means a settled question. Definite anatomical changes are present, but we are very far from being able to relate the psychological symptoms to these changes. We have, at least, positive information as to the functional nature of early schizophrenic conditions; moreover the organic character of paranoia and many paranoid forms is still in great uncertainty. This being so it is worth while to inquire whether manifestations of degeneration could not also be provoked by psychological disturbance of function. Such an idea is only incomprehensible to those who smuggle materialistic preconceptions into their scientific theories. This question does not even rest upon some fundamental and arbitrary spiritualism, but upon the following simple reflection. Instead of assuming that some hereditary disposition, or a toxæmia, gives rise directly to organic processes of disease, I incline to the view that upon the basis of predisposition, whose nature is at present unknown to us, there arises a non-adaptable psychological function which can proceed to develop into manifest mental disorder; this may secondarily determine organic degeneration with its own train of symptoms. In favour of this conception is the fact that we have no proof of the primary nature of the organic disorder, but overwhelming proofs exist of a primary psychological fault in function, whose history can be traced back to the patient's childhood. In perfect agreement with this conception is the fact that analytic practice has given us experience of cases where patients on the borderline of dementia præcox have been brought back to normal life.

Even if anatomical lesions or organic symptoms were constantly present, science ought not to imagine the psychological standpoint could advisedly be neglected, or the undoubted psychological relationship be given up as unimportant. If, for instance, carcinoma were to prove an infectious disease the peculiar growth and degenerative process of carcinomatous cells would still be a constant factor requiring investigation on its own account. But, as I have said, the correlation between the anatomical findings and the psychological picture of the disease is so loose that it is extremely desirable to study the psychological side of it thoroughly.

PART I

Psychiatry is the stepchild of medicine. All the other branches of medicine have one great advantage over it—the scientific methods can be applied; there are things to be seen, and felt, physical and chemical methods of investigation to be followed: the microscope shows the dreaded bacillus, the surgeon's knife halts at no difficulty and gives us glimpses of most inaccessible organs of vital importance. Psychiatry, which engages in the exploration of the mind, stands ever at the door seeking in vain to weigh and measure as in the other departments of science. We have long known that we have to do with a definite organ, the brain; but only beyond the brain, beyond the morphological basis do we reach what is important for us—the mind; as indefinable as it ever was, still eluding any explanation, no matter how ingenious. Former ages, endowing the mind with substance, and personifying every incomprehensible occurrence in nature, regarded mental disorder as the work of evil spirits; the patient was looked upon as one possessed, and the methods of treatment were such as fitted this conception. This mediæval conception occasionally gains credence and expression even to-day. A classical example is the driving out of the devil which the elder Pastor Blumhardt carried out successfully in the famous case of Gottlieb in Deltus.^[196] To the honour of the Middle Ages let it also be said that there are to be found early evidences of a sound rationalism. In the sixteenth century at the Julius Hospital in Würzburg mental patients were already treated side by side with others physically ill, and the treatment seems to have been really humane. With the opening of the modern era, and with the dawn of the first scientific ideas, the original barbaric personification of the unknown Great Power gradually disappeared. A change arose in the conception of mental disease in favour of a more philosophic moral attitude. The old view that every misfortune was the revenge of the offended gods returned new-clothed to fit the times. Just as physical diseases can, in many cases, be regarded as self-inflicted on account of negligence, mental diseases were likewise considered to be due to some moral injury, or sin. Behind this conception the angry godhead also stood. Such views played a great *rôle*, right up to the beginning of last century, especially in Germany. In France, however, about the same time a new idea was appearing, destined to sway psychiatry for a hundred years. Pinel, whose statue fittingly stands at the gateway of the Salpêtrière in Paris, took

away the chains from the insane and thus freed them from the symbol of the criminal. In a very real way he formulated for the world the humane and scientific conception of modern times. A little later Esquirol and Bayle discovered that certain forms of insanity ended in death, after a relatively short time, and that certain constant changes in the brain could be demonstrated *post mortem*. Esquirol had described as an entity general paralysis of the insane, or as it was popularly called "softening of the brain," a disease which is always bound up with chronic inflammatory degeneration of the cerebral matter. Thus was laid the foundation of the dogma which you will find repeated in every text-book of psychiatry, viz. "diseases of the mind are diseases of the brain." Confirmation of this conception was added about the same time by Gall's discoveries which traced partial or complete loss of the power of speech—a psychical capacity—to a lesion in the region of the left lower frontal convolution. Somewhat later this view proved to be of general applicability. Innumerable cases of extreme idiocy or other intense mental disorders were found to be caused by tumours of the brain. Towards the end of the nineteenth century Wernicke (recently deceased) localised the speech centre in the left temporal lobe. This epoch-making discovery raised hopes to the highest pitch. It was expected that at no distant day every characteristic and every psychical activity would be assigned a place in the cortical grey matter. Gradually, increased attempts were made to trace the primary mental changes in the psychoses back to certain parallel changes in the brain. Meynert, the famous Viennese psychiatrist, described a formal scheme in which the alteration in blood-supply in certain regions was to play the chief part in the origin of the psychoses. Wernicke made a similar but far more ingenious attempt at a morphological explanation of psychical disorders. The visible result of this tendency is seen in the fact that even the smallest and least renowned asylum has, to-day, its anatomical laboratory where cerebral sections are cut, stained, and microscoped. Our numerous psychiatric journals are full of morphological contributions, investigations into the structure and distribution of cells in the cortex, and other varying source of disorders in the different mental diseases.

Psychiatry has come into fame as gross materialism. And quite rightly, for it is on the road—or rather reached it long ago—to put the organ, the instrument, above function. Function has become the dependent accessory of its organs, the mind the dependent accessory of the brain. In modern

mental therapy the mind has been the loser, whilst great progress has been made in cerebral anatomy; of the mind we know less than nothing. Current psychiatry behaves like a man who thinks he can unriddle the meaning and importance of a building by a mineralogical investigation of its stones. Let us attempt to realise in which mental diseases obvious changes in the brain are found, and what is their proportion.

In the last four years we have received 1325 patients at Burgholzi,^[197] 331 a year. Of these 9 per cent. suffered from congenital psychic anomalies. By this is understood a certain inborn defect of the psyche. Of these 9 per cent., about a quarter were imbeciles. Here we meet certain changes in the brain such as microcephalus, hydrocephalus, malformations or absence of portions of the brain. The remaining three-quarters of these congenital defects present no typical changes in the brain.

Three per cent. of our patients suffer from epileptic mental troubles. In the course of epilepsy there arises gradually a typical degeneration of the brain. The degeneration is, however, only discoverable in severe cases and when the disease has existed for some time. If the attacks have only existed for a relatively short time, not more than a few years, the brain as a rule shows nothing. Seventeen per cent. of our patients suffer from progressive paralysis and senile dementia. Both diseases present characteristic changes in the brain. In paralysis there is most extensive shrinkage of the brain, so that the cortex is often reduced by one half. The frontal portions of the brain more especially, may be reduced to a third of the normal weight. There is a similar destruction of substance in senile decay.

Fourteen per cent. of the patients annually received are cases of poisoning, at least 13 per cent. of these being due to alcohol. As a rule in slight cases nothing is to be found in the brain; in only a relatively few severe cases is there shrinkage of the cortex, generally of slight degree. The number of these severe cases amounts to less than 1 per cent. of the yearly cases of alcoholism.

Six per cent. of the patients suffer from so-called maniacal depressive insanity which includes the maniacs and the melancholics. The essence of this disease is readily intelligible to the public. Melancholia is a condition of abnormal sadness without disorder of intelligence or memory. Mania is the opposite, the rule being an abnormally excited state with great

restlessness; likewise without deep disturbance of intelligence and memory. In this disease there are no demonstrable morphological changes in the brain.

Forty-five per cent. of the patients suffer from the real and common mental disease called dementia præcox. The name is a very unhappy one, for the dementia is not always precocious, nor in all cases is there dementia. Unfortunately the disease is too often incurable; even in the best cases, in those that recover, where the outside public would not observe any abnormality, there is always present some defect in the emotional life. The picture presented by the disease is extraordinarily diverse; generally there is some disorder of feeling, frequently delusions and hallucinations. As a rule there is nothing to be found in the brain. Even in cases of a most severe type, lasting for years, an intact brain is not infrequently found *post mortem*. In a few cases only certain slight changes are present which, however, cannot as yet be reduced to any law.

To sum up: in round figures a quarter of our insane patients show more or less clearly extensive changes and destruction of the brain, while three-fourths have a brain which seems to be generally unimpaired or at most exhibit such changes as give no explanation of the psychological disturbance.

These figures offer the best possible proof that the purely morphological view-point of modern psychiatry leads only very indirectly, if at all, to the understanding of the mental disorder, which is our aim. We must take into account the fact that those mental diseases which show the most marked disturbances of the brain end in death; for this reason the chronic inmates of the asylum form its real population, consisting of some 70 to 80 per cent. of cases of dementia præcox, that is, of patients in whom anatomical changes are practically non-existent. The psychiatry of the future must come to grips with the core of the thing; the path is thus made clear—*it can only be by way of psychology*. Hence in our Zürich clinic we have entirely discarded the anatomical view and turned to the psychological investigation of insanity. As most of our patients suffer from dementia præcox we were naturally concerned with this as our chief problem.

The older asylum physicians paid great attention to the psychological precursors of mental disorder, just as the public still does, following a true instinct. We accepted this hint and carefully investigated the previous psychological history wherever possible. Our trouble was richly rewarded, for we often found, to our surprise, that the disease broke out at a moment of some great emotion which, in its turn, had arisen in a so-called normal way. We found, moreover, that in the mental disease which ensued a number of symptoms occurred which it was quite labour in vain to study from the morphological standpoint. These same symptoms, however, were comprehensible when considered from the standpoint of the individual's previous history. Freud's fundamental investigations into the psychology of hysteria and dreams afforded us the greatest stimulus and help in our work.

A few instances of the latest method in psychiatry will make the subject clearer than mere dry theory. In order to bring home to you the difference in our conception I will first describe the medical history in the older fashion, and subsequently give the solution characteristic of the new departure.

The case to be considered is that of a cook aged 32; she had no hereditary taint, was always industrious and conscientious, and had never been noticeable for eccentric behaviour or the like. Quite recently she became acquainted with a young man whom she wished to marry. From that time on she began to show certain peculiarities. She often spoke of his not liking her much, was frequently out of sorts, ill-tempered, and sat alone brooding; once she ornamented her Sunday hat very strikingly with red and green feathers, another day she bought a pair of pince-nez in order to wear them when she went out walking with her fiancé. One day the sudden idea that her teeth were rather ugly would not let her rest, and she resolved to get a plate, although there was no absolute need. She had all her teeth out under an anæsthetic. The night after the operation she suddenly had a severe anxiety-attack. She cried and moaned that she was damned for ever, for she had committed a great sin; she should not have allowed her teeth to be extracted. People must pray for her, that God might pardon her sin. In vain her friends attempted to talk her out of her fears, to assure her that the extraction of teeth was really no sin; it availed nothing. At day-break she became somewhat quieter; she worked throughout the day. On following nights the attacks were repeated. When consulted by the patient I found her quiet, but she wore a rather vacant expression. I talked to her about the operation, and she assured me it was not so dreadful to have teeth extracted, but still it was a great sin, from which position, despite every persuasion, she could not be moved. She continually repeated in plaintive, pathetic tones, "I should not have allowed my teeth to be extracted; oh yes, that was a great sin which God will never forgive me." She gave the impression of real insanity. A few days later her condition grew worse, and she had to be brought into the asylum. The anxiety-attack had extended and was persistent, and the mental disorder lasted for months.

The history shows a series of entirely unrelated symptoms. Why all the queer story of the hat and pince-nez? Why those anxiety-attacks? Why this delusion that the extraction of her teeth was an unpardonable sin? Nothing here is clear. The morphologically-minded psychiatrist would say: This is just a typical case of dementia præcox; it is the essence of insanity, of madness, to talk of nothing but mysteries; the standpoint of the diseased mind towards the world is displaced, is "mad." What is no sin for the normal, the patient finds a sin. It is a bizarre delusion characteristic of dementia præcox. The extravagant lamentation about this supposed sin is what is known as "inadequate"^[198] emotional emphasis. The queer ornamentation of the hat, the pince-nez, are bizarre notions such as are very common in these patients. Somewhere in the brain certain cells have fallen into disorder, and manufacture illogical, senseless ideas of one kind and another which are quite without psychological meaning. The patient is obviously a hereditary degenerate with a weak brain, having a kink which is the origin of the disorder. For some reason or other the disease has suddenly broken out. It could just as easily have broken out at any other time. Perhaps we should have had to capitulate to these arguments had real psychological analysis not come to our aid. In filling up the certificate required for her removal to the asylum, it transpired that many years ago she had had an affair which terminated; her lover left her with an illegitimate child. Nobody had

been told of this. When she was again in love a dilemma arose, and she asked herself, What will this new lover say about it? At first she postponed the marriage, becoming more and more worried, and then the eccentricities began. To understand these we must immerse ourselves in the psychology of a naïve soul. If we have to disclose some painful secret to a beloved person we try first to strengthen his love in order to obtain beforehand a guarantee of his forgiveness. We do it by flattery or by caresses, or we try to impress the value of our own personality in order to raise it in the eyes of the other. Our patient decked herself out with beautiful feathers, which to her simple taste seemed precious. The wearing of "pince-nez" increases the respect of children even of a mature age. And who does not know people who will have their teeth extracted, out of pure vanity, in order that they may wear a plate to improve their appearance?

After such an operation most people have a slight, nervous reaction, and then everything becomes more difficult to bear. This was, as a matter of fact, just the moment when the catastrophe did occur, in her terror lest her fiancé should break with her when he heard of her previous life. That was the first anxiety-attack. Just as the patient had not acknowledged her secret in all these years, so she now sought to guard it, and shifted the fear in her guilty conscience on to the extraction of the teeth; she thus followed a method well known to us, for when we dare not acknowledge some great sin we deplore some small sin with the greater emphasis.

The problem seemed insoluble to the weak and sensitive mind of the patient, hence the affect became insurmountably great; this is the mental desire as presented from the psychological side. The series of apparently meaningless events, the so-called madness, have now a meaning; a significance appertains to the delusions, making the patient more human to us. Here is a person like ourselves, beset by universal human problems, no longer merely a cerebral machine thrown out of gear. Hitherto we thought that the insane patient revealed nothing to us by symptoms, save the senseless products of his disordered cerebral cells, but that was academic wisdom reeking of the study. When we penetrate into the human secrets of our patients, we recognise mental disease to be an unusual reaction to emotional problems which are in no wise foreign to ourselves, and the delusion discloses the psychological system upon which it is based.

The light which shines forth from this conception seems to us so enormously powerful because it forces us into the innermost depths of that tremendous disorder which is most common in our asylums, and hitherto least understood; by reason of the craziness of the symptoms it is the type that strikes the public as madness *in excelsis*.

The case which I have just sketched is a simple one. It is transparent. My second example is somewhat more complicated. It is the case of a man between 30 and 40 years of age; he is a foreign archæologist of great learning and most unusual intelligence. He was a precocious boy of quite excellent character, great sensitiveness and rare gifts. Physically he was small, always weakly, and a stammerer. He grew up and was educated abroad, and afterwards studied for several terms at B——. So far there had been no disorder of any kind. On the completion of his university career he became zealously absorbed in his archæological work, which gradually engulfed him to such an extent that he was dead to the world and all its pleasures. He worked incessantly, and buried himself entirely in his books. He became quite unsociable; before, awkward and shy in society, he now fled from it altogether, and saw no

one beyond a few friends. He thus led the life of a hermit devoted entirely to science. A few years later, on a holiday tour, he revisited B——, where he remained a few days. He walked a great deal in the environs of the town. His few acquaintances now found him somewhat strange, taciturn, and nervous. After a somewhat protracted walk he seemed tired, and said that he did not feel very well. He then remarked he must get himself hypnotised, he felt his nerves unsteady. On top of this he was attacked by physical illness, viz. inflammation of the lungs. Very soon a peculiar state of excitement supervened which led to suicidal ideas. He was brought to the asylum, where for weeks he remained in an extremely excited state. He was completely deranged, and did not know where he was; he spoke in broken sentences which no one could understand. He was often so excited and aggressive that it took several attendants to hold him. He gradually became quieter, and one day came to himself, as if waking out of a long, confused dream. He soon completely regained his health, and was discharged as cured. He returned to his home and again immersed himself in books. In the following years he published several remarkable works, but, as before, his life was that of a hermit living entirely in his books and dead to the world. He then gradually acquired the name of a dried-up misanthrope, lost to all meaning of the beauty of life. A few years after his first illness a brief holiday brought him again to B——. As before he took his solitary walks in the environs. One day he was suddenly overcome by a faint feeling, and lay down in the street. He was carried into a neighbouring house where he immediately became extremely excited. He began to perform gymnastics, jumped over the rails of the bed, turned somersaults in the room, began to declaim in a loud, voice, sang his own improvisations, etc. He was again brought to the asylum. The excitement continued. He extolled his wonderful muscles, his beautiful figure, his enormous strength. He believed that he had discovered a natural law by which a wonderful voice could be developed. He regarded himself as a great singer, and a marvellous reciter, and at the same time he was a great inspired poet and composer to whom verse and melody came spontaneously.

All this was in pitiable and very remarkable contrast to reality. He is a small weakly man of unimposing build, with poorly developed muscles betraying at the first glance the atrophying effect of his studious life. He is unmusical, his voice is weak and he sings out of tune; he is a bad speaker, because of his stutter. For weeks he occupied himself in the asylum with peculiar jumping, and contortions of the body which he called gymnastics, he sang and declaimed. Then he became more quiet and dreamy, often stared thoughtfully in front of him for a long time, now and then sang a love song which, despite its want of musical expression, betrayed a pretty feeling for love's aspirations. This also was in complete contrast with the dryness and isolation of his normal life. He gradually became accessible for lengthy conversations.

We will break off the history of the disease here, and sum up what is furnished so far by observation of the patient.

In the first illness the delirium broke out unexpectedly, and was followed by a mental disorder with confused ideas and violence which lasted for several weeks. Complete recovery appeared to have taken place. Six years later there was a sudden outbreak of mania, grandiose delusions, bizarre actions, followed by a twilight-stage gradually leading to recovery. Here we again see a typical case of dementia præcox, of the katatonic variety, especially characterised by peculiar movements and actions. In psychiatry the views obtaining at present would regard this as localised cellular disease of some part of the cortex, exhibiting confusional states,

delusions of grandeur, peculiar contortions of the muscles, or twilight-states, which taken all together have as little psychological meaning as the bizarre shapes of a drop of lead thrown into water.

This is not my view. It was certainly no accidental freak of the brain-cells that created the dramatic contrasts shown in the second illness. We can see that these contrasts, the so-called grandiose delusions, were very subtly determined by the deficiencies in the patient's personality. Without doubt, any one of us would naturally regard these deficiencies seriously in ourselves. Who would not have the desire to find compensation for the aridness of his profession and of his life in the joys of poetry and music and to restore to his body the natural power and beauty stolen from it by the study's atmosphere? Do we not recall with envy the energy of a Demosthenes who, despite his stammering, became a great orator? If our patient thus fulfilled the obvious gaps in his physical and mental life by delusional wishes, the supposition is warranted that the whispered love-song which he sang from time to time filled up a painful blank in his being, which became more painful the more it was concealed. The explanation is not far to seek. It is simply the old story, born anew in every human soul, in a guise befitting the destined creature's highest sensibilities.

When our patient was a student he learnt to know and love a girl-student. Together they made many excursions in the environs of the town, but his exceeding timidity and bashfulness (the lot of the stammerer) never permitted him an opportunity of getting out the appropriate words. Moreover, he was poor and had nothing to offer her but hopes. The time came for the termination of his studies; she went away, and he also, and they never saw one another again. And not long afterwards he heard she had married some one else. Then he relinquished his hopes, but he did not know that Eros never emancipates his slaves.

He buried himself in abstract learning, not to forget, but to work for her in his thoughts. He wanted to keep the love in his heart quite secret, and never to betray that secret. He would dedicate his works to her without her ever knowing it. The compromise succeeded, but not for long. Once he travelled through the town where he heard she lived—it seems to have been an accident that he travelled through that town. He did not leave the train, which only made a short halt there. From the window he saw standing in the distance a young woman with a little child, and thought it was she. Impossible to say whether it was really so or not. He does not think he felt any peculiar feeling at that moment; anyway he gave himself no trouble to ascertain whether it was she, which makes the presumption strong that it was not really she. The unconscious wanted to be left in peace with its illusion. Shortly afterwards he again came to B——, the place of old memories. Then he felt something strange stir in his soul, an uneasy feeling, akin to Nietzsche's—

"Not for long shalt thou thirst, O burning heart!
There is promise in the air,
Winds come to me from unknown mouths—
The healing coolness comes."

Civilised man no longer believes in demons, he calls in the doctor. Our patient wanted to be hypnotised. Then madness overcame him. What was going on in him?

He answered this question in broken sentences, with long pauses, in that twilight-stage that heralds convalescence. I give as faithfully as may be his own words. When he fell ill he suddenly lost the well-regulated world and found himself in the chaos of an overmastering dream, a sea of blood and fire; the world was out of joint; everywhere conflagration, volcanic outbreaks, earthquakes, mountains fell in, followed by enormous battles where the peoples fell upon one another; he became involved more and more in the battle of nature, he was right in the midst of those fighting, wrestling, defending himself, enduring unutterable misery and pain; gradually he was exalted and strengthened by a strange calming feeling that some one was watching his struggles, that his loved one saw all from afar. That was the time when he showed real violence to the attendants. He felt his strength increasing and saw himself at the head of great armies which he would lead to victory. Then more great battles and at length victory. He would try to get his loved one as prize of victory. As he drew near her the illness ceased, and he awoke from a long dream.

His daily life again began to follow the regular routine. He shut himself up in his work and forgot the abyss within himself. A few years later he is again at B—— Demon or Destiny? Again he followed the old trail and again was overborne by old memories. But this time he was not immersed in the depths of confusion. He remained orientated and *en rapport* with his surroundings. The struggle was considerably milder, but he did gymnastics, practised the arts, and made good his deficiencies; then followed the dreamy stage with the love-songs, corresponding to the period of victory in the first psychosis. In this state, according to his own words, he had a dreamlike feeling as if he stood upon the borders of two worlds and knew not whether truth stood on the right or on the left. He told me, "It is said she is married, but I believe she is not, but is still waiting for me; I feel that it must be so. It is ever to me as if she were not married, and as if success were yet attainable."

Our patient here portrayed but a pale copy of the scene in the first attack of psychosis, when he, the victor, stood before his mistress. In the course of a few weeks after this conversation the scientific interests of the patient again began to predominate. He spoke with obvious unwillingness about his intimate life, he repressed it more and more, and finally turned away from it as if it did not belong to himself. Thus gradually the gate of the under-world became closed. There remained nothing but a certain tense expression, and a look which, though fixed on the outer world, was turned inwards at the same time; and this alone hinted at the silent activity of the unconscious, preparing new solutions for his insoluble problem. This is the so-called cure in dementia præcox.

Hitherto we psychiatrists used not to be able to suppress a laugh when we read an artist's attempts to portray a psychosis. These attempts have been generally regarded as quite useless, for the writer introduces into his conception of the psychosis psychological relationships quite foreign to the clinical picture of the disease. But the artist has not simply proceeded to copy a case out of a psychiatric text-book; he knows as a rule better than the psychiatrist.

The case which I have sketched is not unique, it is typical of a whole class for which the artist Spitteler has created a model of universal validity; the model is *Imago*. I may take for granted that you know his book of that name. The psychological gulf, however, between the creation of the artist and the insane person is great. The world of the artist is one of solved problems; the world of reality, that of unsolved problems. The mental patient is a faithful image of this reality. His solutions are unsatisfying illusions, his cure a temporary giving up of the problem,

which yet goes on working in the depths of the unconscious, and at the appointed time again rises to the surface and creates new illusions with new scenery; part of the history of mankind is here seen abridged.

Psychological analysis is far from being able to explain in complete and illuminating fashion all cases of the disease with which we are here concerned. On the contrary, the majority remain obscure and difficult to understand, and chiefly because only a certain proportion of patients recover. Our last patient is noteworthy because his return to a normal state afforded us a survey of the period of his illness. Unfortunately the advantage of this standpoint is not always possible to us, for a great number of persons never find their way back from their dreams. They are lost in the maze of a magic garden where the same old story is repeated again and again in a timeless present. For patients the hands of the clock of the world remain stationary; there is no time, no further development. It makes no difference to them whether they dream for two days or thirty years. I had a patient in my ward who was five years without uttering a word, in bed, and entirely buried in himself. For years I visited him twice daily, and as I reached his bedside I could see at once that there was no change. One day I was just about to leave the room when a voice I did not recognise called out—"Who are you? What do you want here?" I saw with astonishment that it was the dumb patient who had suddenly regained his voice, and obviously his senses also. I told him I was his doctor, whereupon he asked angrily, why was he kept a prisoner here, and why did no one ever speak to him? He said this in an injured voice just like a normal person whom one had neglected for a couple of days. I informed him that he had been in bed quite speechless for five years and had responded to nothing, whereat he looked at me fixedly and without understanding. Naturally I tried to discover what had gone on in him during these five years, but could learn nothing. Another patient with a similar symptom, when asked why he had remained silent for years, maintained, "Because I wanted to spare the German language."^[199] These examples show that it is often impossible to lift the veil of the secret, for the patients themselves have neither interest nor pleasure in explaining their strange experiences, in which as a rule they realise nothing peculiar.

Occasionally the symptoms themselves are a sign-post to the understanding of the psychology of the disease.

We had a patient who was for thirty-five years an inmate at Burghölzli. For decades she lay in bed, she never spoke or reacted to anything, her head was always bowed, her back bent and the knees somewhat drawn up. She was always making peculiar rubbing movements with her hands, so as to give rise during the course of years to thick horny patches on her hands. She kept the thumb and index finger of her right hand together as in the movement of sewing. When she died I tried to discover what she had been formerly. Nobody in the asylum recalled ever having seen her out of bed. Only our chief attendant had a memory of having seen her sitting in the same attitude as that she afterwards took up in bed, at which time she was making rapid movements of extension of the arm across the right knee; it was said of her that she was sewing shoes, later that she was polishing shoes. As time went on the movements became more limited till finally there remained but a slight rubbing movement, and only the finger and thumb retained the sewing position. In vain I consulted our old attendant, she knew nothing about the patient's previous history. When the seventy-year-old brother came to the funeral I asked him what had been the cause of his sister's illness; he told me that she had had

a love-affair, but for various reasons it had come to nothing. The girl had taken this so to heart that she became low-spirited. In answer to a query about her lover it was found that he was a *shoemaker*.

Unless you see here some strange play of accident, you must agree that the patient had kept the memory-picture of her lover unaltered in her heart for thirty-five years.

One might easily think that these patients who give an impression of imbecility are only burnt-out ruins of humanity. But such is probably not the case. One can often prove directly that such patients register everything going on around them even with a certain curiosity, and have an excellent memory for it all. This is the reason why many patients become for a time pretty sensible again, and develop mental powers which one believed they had long since lost. Such intervals occur occasionally during serious physical disease, or just before death. We had a patient with whom it was impossible to carry on a sane conversation; he only produced a mad medley of delusions and words. He once fell seriously ill physically, and I expected it would be very difficult to treat him. Not at all. He was quite changed, he became friendly and amiable, and carried out all his doctor's orders patiently and gratefully. His eyes lost their evil darting looks, and shone quietly and understandingly. One morning I came to his room with the usual greeting: "Good morning. How are you getting on?" The patient answered me in the well-known way: "There again comes one of the dog and monkey troupe wanting to play the Saviour." Then I knew his physical trouble was over. From that moment the whole of his reason was as if "blown away" again.

From these observations we see that reason still survives, but is pushed away into some corner by the complete preoccupation of the mind with diseased thoughts.

Why is the mind compelled to exhaust itself in the elaboration of diseased nonsense? On this difficult question our new insight throws considerable light. To-day we can say that the pathological images dominate the interests of the patient so completely, because they are simply derivatives of the most important questions that used to occupy the person when normal—what in insanity is now an incomprehensible maze of symptoms used to be fields of vital interest to the former personality.

I will cite as an example a patient who was twenty years in the asylum. She was always a puzzle to the physicians, for the absurdity of her delusions exceeded anything that the boldest imagination could create.

She was a dressmaker by trade, born in 1845, of very poor family. Her sister early went wrong and was finally lost in the swamp of prostitution. The patient herself led an industrious, respectable, reserved life. She fell ill in 1886 in her 39th year—at the threshold of the age when so many a dream is brought to naught. Her illness consisted in delusions and hallucinations which increased rapidly, and soon became so absurd that no one could understand her wishes and complaints. In 1887 she came to the asylum. In 1888 her statements, so far as the delusions were concerned, were not intelligible. She maintained such monstrous things as that: "At night her spinal marrow had been torn out; pains in the back had been caused by substances that went through the walls and were covered with magnetism." "The monopoly fixed the sorrows which are not in the body and do not fly about in the air." "Excursions are made by breathing in chemistry, and by suffocation regions are destroyed."

In 1892 the patient styled herself the "Bank Note Monopoly, Queen of the Orphans, Proprietress of the Burghölzli Asylum;" she said: "Naples and I must provide the world with macaroni" (Nudel).

In 1896 she became "Germania and Helvetia from exclusively pure butter"; she also said, "I am Noah's Ark, the boat of salvation and respect."

Since then the disease has greatly increased; her last creation is the delusion that she is the "lily red sea monster and the blue one."

These instances will show you how far the incomprehensibility of such pathological formations go. Our patient was for years the classic example of meaningless delusional ideas in dementia præcox; and many hundreds of medical students have received from the demonstration of this case a permanent impression of the sinister power of insanity. But even this case has not withstood the newer technique of psychoanalysis. What the patient says is not at all meaningless; it is full of significance, so that he who has the key can understand without overmuch difficulty.

Time does not allow me to describe the technique by means of which I succeeded in lifting the veil of her secret. I must content myself by giving a few examples to make the strange changes of thought and of speech in this patient clear to you.

She said of herself that *she was Socrates*. The analysis of this delusion presented the following ideas: Socrates was the wisest man, the man of greatest learning; he was infamously accused, and had to die in prison at the hands of strange men. She was the best dressmaker, but "never unnecessarily cut a thread, and never allowed a piece of material to lie about on the floor." She worked ceaselessly, and now she has been falsely accused, wicked men have shut her up, and she will have to die in the asylum.

Therefore she is Socrates; this is, as you see, simple metaphor, based upon obvious analogy. Take another example: "*I am the finest professor and the finest artist in the world.*"

The analysis furnishes the remarks that she is the best dressmaker and chooses the most beautiful models which show up well and waste little material; she puts on the trimming only where it can be seen. She is a professor, and an artist in her work. She makes the best clothes and calls them absurdly "The Schnecke Museum-clothes." Her customers are only such persons as frequent the Schnecke House and the Museum (the Schnecke House is the aristocratic club. It is near the Museum and the Library, another rendezvous of the aristocratic set of Zürich), for she is the best dressmaker and makes only Schnecke Museum^[200] clothing.

The patient also *calls herself Mary Stuart*. Analysis showed the same analogy as with Socrates: innocent suffering and death of a heroine.

"*I am the Lorelei.*" Analysis: This is an old and well-known song: "I know not what it means," etc. Whenever she wants to speak about her affairs people do not understand her, and say they don't know what it means; hence she is the Lorelei.

"*I am Switzerland.*" Analysis: Switzerland is free, no one can rob Switzerland of her freedom. The patient does not belong to the asylum, she would be free like Switzerland, hence she is Switzerland.

"*I am a crane.*" Analysis: In the "Cranes of Ibykus" it is said: "Whosoever is free of sin and fault shall preserve the pure soul of a child." She has been brought innocent to the asylum and has never committed a crime—hence she is a crane.

"*I am Schiller's Bell.*" Analysis: Schiller's Bell is the greatest work of the great master. She is the best and most industrious dressmaker, and has achieved the highest rung in the art of dressmaking—hence she is Schiller's Bell.

"*I am Hufeland.*" Analysis: Hufeland was the best doctor. She suffers intolerably in the asylum and is moreover treated by the worst doctors. She is, however, so prominent a personality that she had a claim to the best doctors, that is to a doctor like Hufeland—hence she is Hufeland.

The patient used the expression "I am" in a very arbitrary way. Sometimes it meant "it belongs to me" or "it is proper for me"; sometimes it means "I should have." This is seen from the following analysis:

"*I am the master-key.*" Analysis: The master-key is the key that opens all the doors of the asylum. Properly, according to all rights, the patient should long since have obtained this key for she has been for many years "the proprietress of the Burghölzli Asylum." She expresses this reflection very much simplified in the sentence, "I am the master-key."

The chief content of her delusions is concentrated in the following words:—

"*I am the monopoly.*" Analysis: The patient means the banknote monopoly, which has belonged to her for some time. She believes that she possesses the monopoly of the entire bank notes of the world, thus creating enormous riches for herself, in compensation for the poverty and lowliness of her lot. Her parents died early; hence she is the Queen of the Orphans. Her parents lived and died in great poverty. Her blessings are extended to them also, the dreamlike delusions of the patient benefit them in many ways. She says textually: "My parents are clothed by me, my sorely-tried mother, full of sorrow—I sat with her at table—covered in white with superfluity."

This is another of these malleable hallucinations which the patient had daily. It is one of those scenes of wish-fulfilment, with poverty on one side and riches on the other, recalling Hauptmann's Hannele; more especially that scene where Gottwald says: "She was clothed in rags—now she is bedeckt in silken robes; and she ran about barefoot—now she has shoes of glass to her feet. Soon she will live in a golden castle and eat each day of baked meats. Here has she lived on cold potatoes...."

The wish-fulfilments of our patient go even further. Switzerland has to furnish her with an income of 150,000 francs. The Director of the Burghölzli owes her 80,000 francs damages for wrongful incarceration. She is the proprietress of a distant island with silver mines, the "mightiest silver island in the world." Therefore she is also the greatest orator, possesses the most wonderful eloquence, for, as she says, "Speech is *silver*, silence gold." To her all the beautiful landed estates belong—all the rich quarters, towns and lands, she is the proprietress of a world, even a "threefold proprietress of the world." Whilst poor Hannele was only elevated to the side of the Heavenly Bridegroom, our patient has the "Key of Heaven," she is not only the honoured earthly queens Mary Stuart and Queen Louise of Prussia, but she is also the Queen of Heaven, the Mother of God as well as the Godhead. Even in this earthly

world where she was but a poor, ill-regarded homely dressmaker she attained fulfilments of her human wishes, for she had taken three husbands from the best families in the town and her fourth was the Emperor Francis. From these marriages there were two phantom children—a little boy and a little girl. Just as she clothed, fed and feasted her parents, so she provided for the future of her children. To her son she bequeathed the great bazaar of Zürich, therefore her son is a "Zur," for the proprietor of a *Bazaar* is a "Zur." The daughter resembles her mother; hence she becomes the proprietress of the asylum and takes her mother's place so that the mother is released from captivity. The daughter therefore receives the title of "Agency of Socrates," for she replaces Socrates in captivity.

These instances by no means exhaust the delusional fancies of the patient. But they will give you some idea, I hope, of the richness of her inner life although she was apparently so dull and apathetic, or, as was said *imbecile*, and sat for twenty years in her workroom, where she mechanically repaired her linen, occasionally uttering a complex of meaningless fragments which no one had hitherto been able to understand. Her odd lack of words can now be seen in another light; they are fragments of enigmatical inscriptions, of fairy-story phantasies, which have escaped from the hard world to found a world of their own. Here the tables are ever laden, and a thousand feasts are celebrated in golden palaces. The patient can only spare a few mysterious symbols for the gloomy dim shores of reality; they need not be understood, for our understanding has not been necessary for her for this long time.

Nor is this patient at all unique. She is one of a type. Similar phantasies are always found in patients of this kind, though not always in such profusion.

The parallels with Hauptmann's Hannele show that here likewise the artist has shown us the way with the free creation of his own phantasy. From this coincidence, which is not accidental, we may conclude that there is something common both to the artist and the insane and not to them alone. Every human being has also within himself that restless creative phantasy which is ever engaged in assuaging the harshness of reality. Whoever gives himself unsparingly and carefully to self-observation, will realise that there dwells within him something which would gladly hide and cover up all that is difficult and questionable in life, and thus procure an easy and free path. Insanity grants the upper hand to this something. When once it is uppermost, reality is more or less quickly driven out. It becomes a distant dream, and the dream which enchains the patient wholly or in part, and often for life, has now the attributes of reality. We normal persons, who have to do entirely with reality, see only the products of disordered fancy, but not the wealth of that side of the mind which is turned away from us. Unfortunately only too often no further knowledge reaches us of the things which are transpiring on that other side, because all the bridges are broken down which unite this side with that.

We do not know to-day whether these new views are of universal or only of limited validity; the more carefully and perseveringly we examine our patients, the more we shall meet cases, which, despite apparent total imbecility, will yet afford us at least some fragmentary insight into the obscurities of the psychical life. This life is far removed from that mental poverty which the prevailing theories were compelled to accept.

However far we are from being able to understand fully the concatenations of that obscure world, at least we may maintain, with complete assurance, that in dementia præcox there is no

symptom which can be described as psychologically baseless and meaningless. The most absurd things are in reality symbols of ideas which are not only generally understandable, but also universally operative in the human heart. In insanity we do not discover anything new and unknown, but we look at the foundation of our own being, the source of those life-problems in which we are all engaged.

PART II.^[201]

The number of psychoanalytic investigations into the psychology of dementia præcox has considerably increased since the publication of my book upon the subject.^[202] When, in 1903, I made the first analysis of a case of dementia præcox, there dawned on me a premonition of the possibilities of future discoveries in this sphere. This has been confirmed.

Freud first submitted a case of paranoid dementia to closer psychological investigation.^[203] This he was enabled to do by means of an analytic technique perfected through his rich experiences with neurotics. He selected the famous autobiography of P. Schreber, "Denkwürdigkeiten eines Nervenkranken." The patient could not be analysed personally, but having published his most interesting autobiography all the material wanted for an analysis was to be found in it.

In this study Freud shows out of what infantile forms of thought and instincts the delusional system was built up. The peculiar delusions which the patient had about his doctor whom he identified with God or with a god-like being, and certain other surprising and really blasphemous ideas, Freud was able to reduce most ingeniously to his infantile relationship to his father. This case also presented similar bizarre and grotesque concatenations of ideas to the one I have described. As the author himself says, his work confines itself to the task of pointing out those universally existent and undifferentiated foundations out of which we may say every psychological formation is historically developed.^[204] This reductive analytical process did not, however, furnish such enlightening results in regard to the rich and surprising symbolism in patients of this kind as we had been accustomed to expect from the same method in the realm of the psychology of hysteria. In reading certain works of the Zürich school, for example, Maeder,^[205] Spielrein,^[206] Nelken,^[207] Grebelskaja,^[208] Itten,^[209] one is powerfully impressed by the enormous symbol-formation in dementia præcox.

Some of the authors still proceed essentially by the method of analytic reduction, tracing back the complicated delusional formation into its simpler and more universal components, as I have done in the preceding pages. One cannot, however, resist the feeling that this method hardly does justice to the fulness and the almost overpowering wealth of phantastic symbol-formation, although it does undoubtedly throw a light upon the subject in certain directions.

Let me illustrate with an example. We should be thankful for a commentary upon "Faust" which traced back all the diverse material of Part II. to its historical sources, or for a psychological analysis of Part I. which pointed out how the dramatic conflict corresponds to a personal conflict in the soul of the poet; we should be glad of an exposition which pointed out how this subjective conflict is itself based upon those ultimate and universal human things which are nowise foreign to us since we all carry the seeds of them in our hearts. Nevertheless we should be a little disappointed. We do not read "Faust" just in order to

discover that also we are, in all things, "human, all too human." Alas, we know that but too well already. Let any one who has not yet learnt it go for a little while out into the world and look at it without preconceptions and with open eyes. He will turn back from the might and power of the "too human," hungrily he will pick up his "Faust," not to find again what he has just left, but to learn how a man like Goethe shakes off these elemental human things and finds freedom for his soul. When we once know who was the "Proktophantasmist," to what chronological events the mass of symbols in Part II. relates, how it is all intimately bound up with the poet's own soul and conditioned by it, we come to regard this determination as less important than the problem itself—what does the poet mean by his symbolic creation? Proceeding purely reductively, one discovers the final meaning in these universal human things; and demands nothing further from an explanation than that the unknown and complicated shall be reduced to the known and simple. I should like to designate this kind of understanding as *retrospective understanding*. But there is another kind of understanding, which is not analytic reduction, but is of a *synthetic* or *constructive* nature. I would designate this *prospective understanding*, and the corresponding method as the *Constructive method*.

It is common knowledge that present-day scientific explanation rests upon the basis of the causal principle. Scientific explanation is causal explanation. We are therefore naturally inclined, whenever we think scientifically, to explain causally, to understand a thing and to regard it as explained whenever it is reduced analytically to its cause and general principle. In so far Freud's psychological method of interpretation is strictly scientific.

If we apply this method to "Faust" it must become clear that something more is required for a true understanding. It will even seem to us that we have not gathered the poet's deepest meaning if we only see in it universal foregone human conclusions. What we really want to find out is how this man has redeemed himself as an individual, and when we arrive at this comprehension then we shall also understand the symbol given by Goethe. It is true we may then fall into the error that we understand Goethe himself. But let us be cautious and modest, simply saying we have thereby arrived at an understanding of ourselves. I am thinking here of Kant's thought-compelling definition of comprehension, as "the realisation of a thing to the extent which is sufficient for our purpose."

This understanding is, it is true, subjective, and therefore not scientific for those to whom science and explanation by the causal principle are identical. But the validity of this identification is open to question. In the sphere of psychology I must emphasise my doubt on this point.

We speak of "objective" understanding when we have given a causal explanation. But at bottom, understanding is a subjective process upon which we confer the quality "objective" really only to differentiate it from another kind of understanding which is also a psychological and subjective process, but upon which, without further ado, we bestow the quality "subjective." The attitude of to-day only grants scientific value to "objective" understanding on account of its universal validity. This standpoint is incontestably correct wherever it is not a question of the psychological process itself, and hence it is valid in all sciences apart from pure psychology.

To interpret Faust objectively, *i.e.* from the causal standpoint, is as though a man were to consider a sculpture from the historical, technical and—last but not least—from the

mineralogical standpoint. But where lurks the *real meaning* of the wondrous work? Where is the answer to that most important question: what aim had the artist in mind, and how are we ourselves to understand his work subjectively? To the scientific spirit this seems an idle question which anyhow has nothing to do with science. It comes furthermore into collision with the causal principle, for it is a purely speculative constructive view. And the modern world has overthrown this spirit of scholasticism.

But if we would approach to an understanding of psychological things we must remember the fact of the subjective conditioning of all knowledge. The world is *as we see it* and not simply objective; this holds true even more of the mind. Of course it is possible to look at the mind objectively, just as at Faust, or a Gothic Cathedral. In this objective conception there is comprised the whole worth and worthlessness of current experimental psychology and psychoanalysis. The scientific mind, thinking causally, is incapable of understanding what is ahead; it only understands what is past, that is, retrospective. Like Ahriman, the Persian devil, it has the gift of After-Knowledge. But this spirit is only one half of a complete comprehension. The other more important half is prospective or constructive; if we are not able to understand what lies ahead, then nothing is understood. If psychoanalysis, following Freud's orientation, should succeed in presenting an uninterrupted and conclusive connection between Goethe's infantile sexual development and his work, or, following Adler, between the infantile struggle for power and the adult Goethe and his work, an interesting proposition would have been solved—we should have learnt how a masterpiece can be reduced to the simplest thinkable elements, which are universal, and to be found working within the depths of everything and everybody. But did Goethe construct his work to *this* end? Was it his intention that it should be thus conceived?

It must be sufficiently clear that such an understanding, though undoubtedly scientific, would be entirely, utterly, beside the mark. This statement is valid for psychology in general. To understand the psyche causally, means to understand but half of it. The causal understanding of Faust enlightens us as to how it became a finished work of art, but reveals nothing of the living meaning of the poet. That meaning only lives if we experience it, in and through ourselves. In so far as our actual present life is for us something essentially new and not a repetition of all that has gone before, the great value of such a work is to be seen, not in its causal development, but in its living reality for our own lives. We should be indeed depreciating a work like Faust if we were only to regard it as something that has been perfected and finished; it is only understood when conceived as a becoming and as an ever new-experiencing.

Thus we must regard the human psyche. Only on one side is the mind a Has Been, and as such subordinate to the causal principle. On the other side the mind is a Becoming that can only be grasped synthetically or constructively. The causal standpoint asks how it is this actual mind has become what it appears to-day? The constructive standpoint asks how a bridge can be built from this actual psyche to its own future?

Just as the causal method finally reaches the general principles of human psychology by the analysis and reduction of individual events, so does the constructive standpoint reach aims that are general by the synthesis of individual tendencies. The mind is a point of passage and thus necessarily determined from two sides. On the one side it offers a picture of the

precipitate of the past, and on the other side a picture of the germinating knowledge of all that is to come, in so far as the psyche creates its own future.

What has been is, on the one hand, the result and apex of all that was—as such it appears to the causal standpoint; on the other hand, it is an expression of all that is to be. The future is only *apparently* like the past, but in its essence always new and unique, (the causal standpoint would like to invert this sentence) thus the actual formula is incomplete, germlike so to say, in relation to what is to be.

To get any conception of this expression of what is to be we are forced to apply a constructive interest to it. I almost felt myself tempted to say, "a scientific interest." But modern science is identical with the causal principle. So long as we consider the actual mind causally, that is scientifically, we elude the mind as a Becoming. This other side of the psyche can never be grasped by the exclusive use of the causal principle, but only by means of the constructive standpoint. The causal standpoint reduces things to their elements, the constructive standpoint elaborates them into something higher and more complicated. This latter standpoint is necessarily a speculative one.

Constructive understanding is, however, differentiated from scholastic speculation because it imposes no general validity, but only subjective validity. When the speculative philosopher believes he has comprehended the world once for all by his System, he deceives himself; he has only comprehended himself and then naïvely projected that view upon the world. In reaction against this, the scientific method of the modern world has almost put an end to speculation and gone to the other extreme. It would create an "objective" psychology. In opposition to such efforts, the stress which Freud has placed upon individual psychology is of immortal merit. The extraordinary importance of the subjective in the development of the objective mental process was thus first brought adequately into prominence.

Subjective speculation lays no claim to universal validity, it is identical with constructive understanding. It is a subjective creation, which, looked at externally, easily seems to be a so-called infantile phantasy, or at least an unmistakable derivative of it; from an objective standpoint it must be judged as such, in so far as objective is regarded as identical with scientific or causal. Looked at from within, however, constructive understanding means redemption.

"Creation—that is the great redemption from suffering and easiness of living."^[210]

Starting from these considerations as to the psychology of those mental patients to whom the Schreber case belongs, we must, from the "objective-scientific" standpoint, reduce the structural phantasy of the patient to its simple and most generally valid elements. This Freud had done. But that is only half of the work to be done. The other half is the constructive understanding of Schreber's system. The question is: What end, what freedom, did the patient hope to achieve by the creation of his system?

The scientific thinker of to-day will regard this question as inappropriate. The psychiatrist will certainly smile at it, for he is thoroughly assured of the universal validity of his causalism, he knows the psyche merely as something that is made, descendent, reactive. Not uncommonly there lurks the unconscious prejudice that the psyche is a brain-secretion.

Looking at such a morbid system without preconception, and asking ourselves what goal this delusional system is aiming at, we see, in fact, firstly, that it *is* endeavouring to get at something, and secondly, that the patient also devotes all his will-power to the service of the system. There are patients who develop their delusions with scientific thoroughness, often dragging in an immense material of comparison and proof. Schreber certainly belongs to this class. Others do not proceed so thoroughly and learnedly, but content themselves with heaping up synonymous expressions for that at which they are aiming. The case of the patient I have described, who assumes all kinds of titles, is a good instance of this.

The patient's unmistakable striving to express something through and by means of his delusion Freud conceives retrospectively, as the satisfaction of his infantile wishes by means of imagination. Adler reduces it to the desire for power.

For him the delusion-formation is a "manly protest," a means of gaining security for himself against his menaced superiority. Thus characterised, this struggle is likewise infantile and the means employed—the delusional creation—is infantile because insufficient for its purpose; one can therefore understand why Freud declines to accept Adler's point of view. Freud, rightly on the whole, subsumes this infantile struggle for power under the concept of the infantile wish.

The constructive standpoint is different. Here the delusional system is neither infantile nor, upon the whole, *eo ipso* pathological but *subjective*, and hence justified within the scope of the subjective. The constructive standpoint absolutely denies the conception that the subjective phantasy-creation is merely an infantile wish, symbolically veiled; or that it is merely that in a higher degree; it denies that it is a convulsive and egoistic adhesion to the fiction of its own superiority, in so far as these are to be regarded as finalistic explanations. The subjective activity of the mind can be judged from without, just as one can, in the end, so judge everything. But this judgment is inadequate, because it is the very essence of the subjective that it cannot be judged objectively. We cannot measure distance in pints. The subjective can be only understood and judged subjectively, that is, constructively. Any other judgment is unfair and does not meet the question.

The absolute credit which the constructive standpoint confers upon the subjective, naturally seems to the "scientific" spirit as an utter violation of reason. But this scientific spirit can only take up arms against it so long as the constructive is not avowedly *subjective*. The constructive comprehension also *analyses*, but it does not *reduce*. It decomposes the delusion into *typical* components. What is to be regarded as the type at a given time is shown from the attainment of experience and knowledge reached at that time.

Even the most individual delusional systems are not absolutely unique, occurring only once, for they offer striking and obvious analogies with other systems. From the comparative analysis of many systems the typical formations are drawn. If one can speak of reduction at all, it is only a question of reduction to general type, but not to some universal principle obtained inductively or deductively, such as "Sexuality" or "Struggle for Power." This paralleling with other typical formations only serves for a widening of the basis upon which the construction is to be built. If one were to proceed entirely subjectively one would go on constructing in the language of the patient and in his mental range. One would arrive at some structure which was illuminating to the patient and to the investigator of the case but not to

the outer scientific public. The public would be unable to enter into the peculiarities of the speech and thought of the individual case in question without further help.

The works of the Zürich school referred to contain careful and detailed expositions of individual material. In these materials there are very many typical formations which are unmistakably *analogies* with *mythological formations*^[211]. There arose from the perception of this relationship a new and valuable source for comparative study. The acceptance of the possibility of such a comparison will not be granted immediately, but the question is only whether the materials to be compared really are similar or not. It will also be contended that pathological and mythological formations are not immediately comparable. But this objection must not be raised *a priori*, for only a conscientious comparison can determine whether any true parallelism exists or not. At the present moment all we know is that they are both structures of the imagination which, like all such products, rest essentially upon the activity of the unconscious. Experience must teach us whether such a comparison is valid. The results hitherto obtained are so encouraging that further work along these lines seems to me most hopeful and important. I made practical use of the constructive method in a case which Flournoy published in the *Archives de Psychologie*, although he offered no opinion as to its nature at that time.

The case dealt with a rather neurotic young lady who, in Flournoy's publication, described how surprised she was at the connected phantasy-formations which penetrated from the unconscious into the conscious. I subjected these phantasies, which the lady herself reproduced in some detail, to my constructive methods and gave the results of these investigations in my book, "The Psychology of the Unconscious."

This book has, I regret to say, met with many perhaps inevitable misunderstandings. But I have had one precious consolation, for my book received the approval of Flournoy himself, who published the original case which he knew personally. It is to be hoped that later works will make the standpoint of the Zürich school intelligible to a wider public. Whoever, by the help of this work, has taken the trouble to grasp the essence of the constructive method, will readily imagine how great are the difficulties of investigation, and how much greater still are the difficulties of objective presentation of such investigations.

Among the many difficulties and opportunities for misunderstanding I should like to adduce one difficulty which is especially characteristic. In an intensive study of Schreber's or any similar case, it will be discovered that these patients are consumed by the desire for a new world-philosophy which may be of the most bizarre kind. Their aim is obviously to create a system such as will help them in the assimilation of unknown psychical phenomena, *i.e.* enable them to adapt their own unconscious to the world. This arrangement produces a subjective system which must be considered as a necessary transition-stage on the path to the adaptation of their personality in regard to the world in general. But the patient remains stationary at this transitory stage and assumes his subjective view is the world's, hence he remains ill. He cannot free himself from his subjectivism and does not find the link to objective thinking, *i.e.* to society. He does not reach the real summit of self-understanding, for he remains with a merely subjective understanding of himself. But a *mere* subjective understanding is not real and adequate. As Feuerbach says: *Understanding is only real when*

it is in accord with that of some other rational beings. Then it becomes objective^[212] and the link with life is reached.

I am convinced that not a few will raise the objection that in the first place the psychological process of adaptation does not proceed by the method of first creating a world-philosophy; secondly, that it is in itself a sign of unhealthy mental disposition even to make the attempt to adapt oneself by way of a "world-philosophy."

Undoubtedly there are innumerable persons who are capable of adaptation without creating any preliminary philosophy. If they ever arrive at any general theory of the world it is always subsequently. But, on the other hand, there are just as many who are only able to adapt themselves by means of a preliminary intellectual formulation. To everything which they do not understand they are unable to adapt themselves. Generally it comes about that they do adapt themselves just in so far as they can grasp the situation intellectually. To this latter group seem to belong all those patients to whom we have been giving our consideration.

Medical experience has taught us that there are two large groups of functional nervous disorders. The one embraces all those forms of disease which are designated *hysterical*, the other all those forms which the French school has designated *psychasthenic*. Although the line of demarcation is rather uncertain, one can mark off two psychological types which are obviously different; their psychology is diametrically opposed. I have called these—the *Introverted* and *Extroverted* types. The hysteric belongs to the type of *Extroversion*, the psychasthenic to the type of *Introversion*, as does dementia præcox, in so far as we know it to-day. This terminology, *Introversion* and *Extroversion*, is bound up with my way of regarding mental phenomena as forms of energy. I postulate a hypothetical fundamental striving which I designate *libido*.^[213] In the classical use of the word, *libido* never had an exclusively sexual connotation as it has in medicine. The word *interest*, as Claparède once suggested to me, could be used in this special sense, if this expression had to-day a less extensive application. Bergson's concept, *élan vital*, would also serve if this expression were less biological and more psychological. *Libido* is intended to be an energising expression for *psychological values*. The psychological value is something active and determining; hence it can be regarded from the energetic standpoint without any pretence of exact measurement.

The introverted type is characterised by the fact that his *libido* is turned towards his own personality to a certain extent—he finds within himself the unconditioned value. The extroverted type has his *libido* to a certain extent externally; he finds the unconditioned value outside himself. The introvert regards everything from the aspect of his own personality; the extrovert is dependent upon the value of his object. I must emphasise the statement that this question of types is *the* question of our psychology, and that every further advance must probably proceed by way of this question. The difference between these types is almost alarming in extent. So far there is only one small preliminary communication by myself^[214] on this theory of type, which is particularly important for the conception of dementia præcox. On the psychiatric side Gross^[215] has called attention to the existence of two psychological types. His two types are (1) those with limited but deep consciousness, and (2) those with broad but superficial consciousness. The former correspond to my introverted and the latter to my extroverted type. In my article I have collected some other instances among which I would especially call attention to the striking description of the two types given by William

James in his book on "Pragmatism." Fr. Th. Vischer has differentiated the two types very wittily by her division of the learned into "reason-mongers," and "matter-mongers." In the sphere of psychoanalysis Freud follows the psychology of Extraversion, Adler that of Introversion. The irreconcilable opposition between the views of Freud and those of Adler (see especially his book "Über den nervösen Charakter") is readily explained by the existence of two diametrically opposed psychological types which view the same things from entirely different aspects. An Extrovert can hardly, or only with great difficulty, come to any understanding with an Introvert, on any delicate psychological question.

An Extrovert can hardly conceive the necessity which compels the Introvert to conquer the world by means of a system. And yet this necessity exists, otherwise we should have no philosophical systems and dogmas, presumed to be universally valid. Civilised humanity would be only empiricists and the sciences only the experimental sciences. Causalism and empiricism are undoubtedly mighty forces in our present-day mental life but it may come to be otherwise.

This difference in type is the first great obstacle which stands in the way of an understanding concerning fundamental conceptions of our psychology. A second objection arises from the circumstance that the constructive method, faithful to itself, must adapt itself to the lines of the delusion. The direction along which the patient develops his morbid thoughts has to be accepted seriously, and followed out to its end; the investigator thus places himself at the standpoint of the psychosis. This procedure may expose him to the suspicion of being deranged himself; or at least risks a misunderstanding which is considered terribly disgraceful—he may himself have some world-philosophy! The confirmation of such a possibility is as bad as being "unscientific." But every one has a world-philosophy though not every one knows he has. And those who do not know it have simply an unconscious and therefore inadequate and archaic philosophy. But everything psychological that is allowed to remain in the mind neglected and not developed, remains in a primitive state. A striking instance of how universal theories are influenced by unconscious archaic points of view has been furnished by a famous German historian whose name matters to us not at all. This historian took it for granted that once upon a time people propagated themselves through incest, for in the first human families the brother was assigned to the sister. This theory is wholly based upon his still unconscious belief in Adam and Eve as the first and only parents of mankind. It is on the whole better to discover for oneself a modern world-philosophy, or at least to make use of some decent system which will prevent any errors of that kind.

One could put up with being despised as the possessor of a world-philosophy; but there is a greater danger. The public may come to believe the philosophy, beaten out by the constructive method, is to be regarded as a theoretical and objectively valid insight into the meaning of the world in general.

I must now again point out that it is an obstinate, scholastic misunderstanding not to be able to distinguish between a world-philosophy which is only psychological, and an extra-psychological theory, which concerns the objective thing. It is absolutely essential that the student of the results of the constructive method should be able to draw this distinction. In its first results the constructive method does not produce anything that could be called a scientific theory; it furnishes the *psychological lines of development*, a *path* so to say. I must here refer the reader to my book, "Psychology of the Unconscious."

The analytic reductive method has the advantage of being much simpler than the constructive method. The former reduces to well-known universal elements of an extremely simple nature. The latter has, with extremely complicated material, to construct the further path to some often unknown end. This obliges the psychologist to take full account of all those forces which are at work in the human mind. The reductive method strives to replace the religious and philosophical needs of man, by their more elementary components, following the principle of the "nothing but," as James so aptly calls it. But to *construct* aright, we must accept the developed aspirations as indispensable components, essential elements, of spiritual growth. Such work extends far beyond empirical concepts but that is in accordance with the nature of the human soul which has never hitherto rested content with experience alone. Everything new in the human mind proceeds from speculation. Mental development proceeds by way of speculation, never by way of limitation to mere experience. I realise that my views are parallel with those of Bergson, and that in my book the concept of the libido which I have given, is a concept parallel to that of "élan vital"; my constructive method corresponds to Bergson's "intuitive method." I, however, confine myself to the psychological side and to practical work. When I first read Bergson a year and a half ago I discovered to my great pleasure everything which I had worked out practically, but expressed by him in consummate language and in a wonderfully clear philosophic style.

Working speculatively with psychological material there is a risk of being sacrificed to the general misunderstanding which bestows the value of an objective theory upon the line of psychological evolution thus elaborated. So many people feel themselves in this way at pains to find grounds whether such a theory is correct or not. Those who are particularly brilliant even discover that the fundamental concepts can be traced back to Heraclitus or some one even earlier. Let me confide to these knowing folk that the fundamental ideas employed in the constructive method stretch back even beyond any historical philosophy, viz. to the dynamic "views" of primitive peoples. If the result of the constructive method were scientific theory, it would go very ill with it, for then it would be a falling back to the deepest superstition. But since the constructive method results in something far removed from scientific theory the great antiquity of the basic concepts therein must speak in favour of its extreme correctness. Not until the constructive method has presented us with much practical experience can we come to the construction of a *scientific theory, a theory of the psychological lines of development*. But we must first of all content ourselves with confirming these lines individually.

FOREWORD TO CHAPTER XIV

This essay was originally written in 1913, when I limited myself entirely to presenting an essential part of the psychological point of view inaugurated by *Freud*. A few months ago my Swiss publisher asked for a second and revised edition. The many and great changes which the last few years have brought about in our understanding of the psychology of the unconscious necessitated a substantial enlargement of my essay. In this new edition some expositions about *Freud's* theories are shortened, whilst *Adler's* psychological views are more fully considered, and—so far as the scope of this paper permits—a general outline of my own views are given. I must at the outset draw the reader's attention to the fact that this is no longer an easy "popular" scientific paper, but a presentation making great demands upon the patience and attention of the reader. The material is extremely complicated and difficult. I do not for a moment deceive myself into thinking this contribution is in any way conclusive or adequately convincing. Only detailed scientific treatises about the various problems touched upon in these pages could really do justice to the subject. Any one who wishes to go deeply into the questions that are raised here must be referred to the special literature of the subject. My attention is solely to give the orientation in regard to the newest concepts of the inner nature of unconscious psychology. I consider the subject of the unconscious to be specially important and opportune at this moment. In my opinion, it would be a great loss if this problem, concerning every one so closely as it does, were to disappear from the horizon of the educated lay public, by being interned in some inaccessible specialised scientific journal. The psychological events that accompany the present war—the incredible brutalisation of public opinion, the epidemic of mutual calumnies, the unsuspected mania for destruction, the unexampled flood of mendacity, and man's incapacity to arrest the bloody demon—are they not, one and all, better adapted than anything else, to force obtrusively the problem of the chaotic unconscious—which slumbers uneasily beneath the ordered world of consciousness,—before the eyes of every thinking individual? This war has inexorably shown to the man of culture that he is still a barbarian. It testifies also what an iron scourge awaits him, if ever again it should occur

to him to make his neighbour responsible for his own bad qualities. The psychology of the individual corresponds to the psychology of nations. What nations do, each individual does also, and as long as the individual does it, the nation will do it too. A metamorphosis in the attitude of the individual is the only possible beginning of a transformation in the psychology of the nation. The great problems of humanity have never been solved by universal laws, but always and only by a remodelling of the attitude of the individual. If ever there was a time when self-examination was the absolutely indispensable and the only right thing, it is now, in the present catastrophic epoch. But he who bethinks himself about his own being strikes against the confines of the unconscious, which indeed contains precisely that which it is most needful for him to know.

C. G. JUNG.

KÜSNACHT-ZÜRICH,
March, 1917.

CHAPTER XIV

THE PSYCHOLOGY OF THE UNCONSCIOUS PROCESSES^[216]

Being a Survey of the Modern Theory and Method of Analytical Psychology

I.—THE BEGINNINGS OF PSYCHOANALYSIS

In common with other sciences, psychology had to go through its scholastic-philosophic stage, and to some extent this has lasted on into the present time. This philosophic psychology has incurred our condemnation in that it decides *ex cathedra* what is the nature of the soul, and whence and how it derives its attributes. The spirit of modern scientific investigation has summarily disposed of all these phantasies and in their place has established an exact empiric method. We owe to this our present-day experimental psychology or "*psychophysiology*," as the French call it. This new direction originated with Fechner, that Janus-minded spirit, who in his remarkable *Psychophysik* (1860) embarked on the mighty enterprise of introducing the physical standpoint into the conception of psychical phenomena. The whole idea of this work—and not least its astonishing mistakes—proved most fruitful in results. For Wundt, Fechner's young contemporary, carried on his work, and it is Wundt's great erudition, enormous power of work and genius for elaborating methods of experimental research, which have given to modern psychology its prevailing direction.

Until quite recently experimental psychology remained essentially academic. The first notable attempt to utilise some few at any rate of its innumerable experimental methods in the service of practical psychology came from the psychiatrists of the former Heidelberg school (Kræpelin, Aschaffenburg, etc.); it is quite intelligible that the psychotherapists should be the first to feel the urgent need for more exact knowledge of psychic processes.

Next came pedagogy, making its own demands upon psychology. Out of this has recently grown up an "experimental pedagogy," and in this field Neumann in Germany and Binet in France have rendered signal services. The physician, the so-called "nerve-specialist," has the most urgent need of psychological knowledge if he would really help his patients, for neurotic disturbances, such as hysteria, and all things classed as "nervousness," are of psychic origin, and necessarily demand psychic treatment. Cold water, light, air, electricity, magnetism, etc., are only effective temporarily, and quite often are of no use at all. They are frequently introduced into treatment in a not very commendable fashion, simply because reliance is placed upon their suggestive effect. But it is in his soul that the patient is really sick; in those most complicated and lofty functions which we scarcely dare to include in the province of medicine. The doctor must needs, in such a case, be a psychologist, must needs understand the human soul. He cannot evade the urgent demand upon him. So he naturally turns for help to psychology, since his psychiatry text-books have nothing to offer him. But modern experimental psychology is very far from being able to afford him any connected insight into the most vital psychic processes, that is not its aim. As far as possible it tries to isolate those simple elementary phenomena which border on the physiological, and then study them in an isolated state. It quite ignores the infinite variation and movement of the mental life of the individual, and accordingly, its knowledge and its facts are so many isolated details, uninspired by any comprehensive idea capable of bringing them into co-ordination. Hence it comes about that the inquirer after the secrets of the human soul, learns rather less than nothing from experimental psychology. He would be better advised to abandon exact science, take off his scholar's gown, say farewell to his study, and then, strong in manly courage, set out to wander through the world; alike through the horrors of prisons, lunatic asylums and hospitals, through dreary outlying taverns, through brothels and gambling-halls, into elegant drawing-rooms, the Stock Exchanges, socialist meetings, churches, revival gatherings of strange religious sects, experiencing in his own person love and hate and every kind of suffering. He would return laden with richer knowledge than his yard-long text-books could ever have given him, and thus equipped, he can indeed be a physician to his patients, for he understands the soul of man. He may be pardoned if his respect for the "corner-stones" of experimental psychology is no longer very considerable.

There is a great gulf fixed between what science calls "psychology," on the one hand, and what the practice of everyday life expects from psychology on the other.

This need became the starting-point of a new psychology whose inception we owe first and foremost to the genius of Sigmund Freud, of Vienna, to his researches into functional nervous disease. The new type of psychology might be described as "analytical psychology." Professor Bleuler has coined the name "Deep Psychology,"^[217] to indicate that the Freudian psychology takes as its province the deeper regions, the "hinterland" of the soul, the "unconscious." Freud names his method of investigation "psychoanalysis."

Before we approach the matter more closely, we must first consider the relationship of the new psychology to the earlier science. Here we encounter a singular little farce which once again proves the truth of Anatole France's apothegm: "Les savants ne sont pas curieux."

The first important piece of work^[218] in this new field awakened only the faintest echo, in spite of the fact that it offered a new and fundamental conception of the neuroses. Certain writers expressed their approbation, and then, on the next page, proceeded to explain their cases of hysteria in the good old way. It was much as if a man should subscribe fully to the idea of the earth's being spherical, and yet continue to represent it as flat. Freud's next publications^[219] were practically unnoticed, although they contributed findings of immeasurable importance to the domain of psychiatry. When in 1900 he produced the first real psychological elucidation of the dream^[220] (previously there had reigned over this territory a suitable nocturnal darkness), he was ridiculed; and when in the middle of the last decade he began to illumine the psychology of sexuality itself,^[221] and at the same time the "Zürich school" decided to range itself on his side, a storm of abuse, sometimes of the coarsest kind, burst upon him, nor has it yet ceased to rage. At the last South-West German Congress of alienists in Baden-Baden, the adherents of the new psychology had the pleasure of hearing Hoche, University Professor of Psychiatry at Freiburg in Breisgau, describe the movement in a long and much-applauded address, as an outbreak of mental aberration *among doctors*. The old proverb: "Medicus medicum non decimat" was here quite put to shame. How carefully the question had been studied was shewn by the naïve remark of one of the most distinguished

neurologists of Paris, which I myself heard at the International Congress in 1907: "It is true I have not read Freud's works (he did not happen to know any German!), but as for his theories, they are nothing but a *mauvaise plaisanterie*." Freud, dignified, masterly, once said to me, I first became clearly conscious of the value of my discoveries when they were met everywhere with resistance and anger; since that time I have judged the value of my work according to the degree of opposition provoked. It is against my sexual theory that the greatest indignation is felt, so it would seem therein lies my best work. Perhaps after all the real benefactors of mankind are its false teachers, for opposition to the false doctrine pushes men willy nilly into truth. Your truth-teller is a pernicious fellow, he drives men into error."

The reader must now calmly accept the idea that in this psychology he is dealing with something quite unique, if not indeed with some altogether irrational, sectarian, or occult wisdom; for what else could possibly provoke all the scientific authorities to turn away on the very threshold and utterly refuse to cross it?

Accordingly, we must look more closely into this psychology. As long ago as Charcot's time it was recognised that neurotic symptoms are "psychogenic," that is, that they have their origin in the psyche. It was also known, thanks mainly to the work of the Nancy School, that every hysterical symptom can be exactly reproduced by means of suggestion. But *how* a hysterical system arises, and its relationship to psychic causes, were altogether unknown. In the beginning of the eighties Dr. Breuer, an old Viennese doctor, made a discovery^[222] which was really the true starting-point of the new psychology. He had a very intelligent young patient (a woman) suffering from hysteria, who exhibited the following symptoms among others: A spastic paralysis of the right arm, occasional disturbances of consciousness or twilight-states, and loss of the power of speech in so far as she no longer retained any knowledge of her mother-tongue, and could only express herself in English (so-called systematic aphasia). They sought at that time, and still seek, in such a case to establish some theory of anatomical disturbance, although there was just as little disturbance in the arm-centre in the brain as in that of any normal man who boxes another's ears. The symptomatology of hysteria is full of anatomical impossibilities; such as the case of the lady who had lost her hearing completely through

some hysterical malady. None the less she often used to sing, and once when she was singing her doctor sat down at the piano unnoticed by her and softly accompanied her. Passing from one strophe to another he suddenly altered the key, and she, quite unconscious of what she was doing, sang on in the altered key. Thus she heard—yet did not hear. The various forms of systematic blindness present similar phenomena. We have the case of a man suffering from complete hysterical blindness. In the course of the treatment he recovers his sight, but at first, and for some long time, only partially: he could see everything with one exception—people's heads. He saw all the people around him without heads. Thus he saw—yet did not see. From a large number of like experiences it has long been concluded that it is only the patient's consciousness which does not see, does not hear, but the sense-function has nothing at all the matter with it. This state of affairs is directly contradictory to the essence of an organic disturbance, which always materially involves the function.

After this digression let us return to Breuer's case. Since there was no organic cause for the disturbance, the case was clearly to be regarded as hysterical, that is, psychogenic. Dr. Breuer had noticed that if during her twilight-states (whether spontaneous or artificially induced) he let the patient freely express the reminiscences and phantasies that thronged in upon her, her condition was afterwards much improved for some hours. He made systematic use of this observation in her further treatment. The patient herself invented the appropriate name for it of "talking cure" or, in jest, "chimney sweeping."

Her illness began whilst she was nursing her dying father. It is easy to understand that her phantasies busied themselves mainly with this disturbing time. In the twilight-states memories of this period reappeared with photographic fidelity, distinct in every detail: no waking recollection is ever so plastically and exactly reproduced. The term hypermnesia is applied to this heightening of the power of memory, which occurs without difficulty in certain states of contracted consciousness. Remarkable things now came to light. Out of the many things told, one ran somewhat as follows.^[223]

On a certain night she was in a state of great anxiety about her father's high temperature. She sat by his bed, waiting for the surgeon who was coming from Vienna to perform an operation. Her mother had gone out of the room

for a little while, and Anna (the patient) sat by the bed, with her right arm hanging over the back of her chair. She fell into a kind of waking-dream in which she saw a black snake come out from the wall and approach the sick man, prepared to bite. (It is very probable that some real snakes had been seen in the fields behind the house, and that she had been frightened by them; this would furnish the material for her hallucination.) She wanted to drive the creature away, but felt paralysed; her right arm, hanging over the chair, had "gone to sleep," was anæsthetic and paretic, and as she looked her fingers turned into little snakes with death's heads (the nails). Probably she tried to drive the snake away with her paralysed right hand, and thereby the anæsthesia and paralysis became associated with the snake-hallucination. Even after the snake had disappeared, her terror remained great. She tried to pray, but found she had no words in any language, until at length she managed to remember some English nursery rhymes, and then she could go on thinking and praying in that language.

This was the actual scene in which the paralysis and speech-disturbance arose; the describing it served to remove the speech-trouble, and in this same fashion the case was finally completely cured.

I must restrict myself to this one instance. In Breuer and Freud's book there is a wealth of similar examples. It is easy to understand that scenes such as these make a very strong impression, and accordingly there is an inclination to attribute a causal significance to them in the genesis of the symptoms. The then current conception of hysteria, arising from the English "nervous shock" theory, which Charcot strongly supported, came in conveniently to elucidate Breuer's discovery, hence arose the *trauma-theory* maintaining that the hysterical symptom and in so far as the symptoms comprise the disease, hysteria itself, arises from some *psychic injury* (or *trauma*), the effect of which is retained in the unconscious indefinitely. Freud, working as Breuer's colleague, amply confirmed this discovery. It was fully demonstrated that not one out of the many hundred hysterical symptoms came down ready made from heaven; they had already been conditioned by past psychic experiences. To some extent, therefore, this new conception opened up a field of very important empirical work. But Freud's tireless spirit of inquiry could not long rest content at this superficial layer, since already there obtruded deeper and more difficult problems. It is obvious enough that moments of great fear and anxiety, such as Breuer's patient

went through, would leave behind a lasting effect, but how is it that these happenings are themselves already deeply stamped with the mark of morbidity? Must we suppose that the trying sick-nursing in itself produce such a result? If so, such effects should occur much more frequently, for there are, unfortunately, many trying cases of sick-nursing, and the nurse's nervous constitution is by no means always of the soundest. To this problem medicine gives its admirable answer; the "x" in the calculation is *predisposition*; there is a tendency to these things. But for Freud the problem was, what exactly constitutes this predisposition? This question led logically to an investigation of all that had preceded the psychic trauma. It is a matter of common observation that distressing scenes have markedly different effects upon the different participants, and that things which to some are quite indifferent or even pleasant, such as frogs, mice, snakes, cats, excite the greatest aversion in others. There are the cases of women who can calmly be present at a very bad operation, but who tremble all over with horror and nausea at the touch of a cat. By way of illustration let me give the case of a young lady suffering from severe hysteria following a sudden fright.^[224] She had been at a social gathering, and was on her way home at midnight accompanied by several acquaintances, when a carriage came up behind them at full speed. All the others moved out of the way, but she, beside herself with fright, ran down the middle of the road just in front of the horses. The coachman cracked his whip and cursed and swore in vain. She ran down the whole length of the street till a bridge was reached. There her strength failed her, and to escape the horses' feet in her despair she would have jumped into the water had not passers-by prevented her. This same lady happened to be in Petrograd during that sanguinary Revolution of the 22nd of January, and saw a street cleared by the volleys of soldiers. All around her people were dropping down dead or wounded, but she retained her calmness and self-possession, and caught sight of a door which gave her escape into another street. These terrible moments agitated her neither at the time nor later on. She was quite well afterwards, indeed felt better than usual.

Essentially similar reactions can quite often be observed. Hence it follows that the intensity of the trauma is of small pathogenic importance; the peculiar circumstances determine its pathogenic effect. Here, then, we have the key which enables us to unlock at least one of the anterooms to an

understanding of predisposition. We must now ask what were the unusual circumstances in this carriage scene? The terror and apprehension began as soon as the lady heard the trampling horses. For a moment she thought this portended some terrible fate, her death, or something equally frightful; the next, she lost all sense of what she was doing.

This powerful impression was evidently connected in some way with the horses. The predisposition of the patient to react in such an exaggerated fashion to a not very remarkable incident, might result from the fact that horses had some special significance for her. It might be suspected that she had experienced some dangerous accident with them; this actually turned out to be the case. When a child of about seven years old she was out for a drive with the coachman; the horses shied and galloped at full speed towards a steep river-bank. The coachman jumped down, and shouted to her to do the same, but in her extreme terror she could scarcely bring herself to obey. She did, however, just manage to jump out in the nick of time, whilst the horses and carriage were dashed to pieces below. No proof is needed that such an experience must leave a lasting impression behind it. But it does not offer any explanation for such an exaggerated reaction to an inadequate stimulus. So far we only know that this later symptom had its prologue in childhood, but its pathological aspect remains obscure. To penetrate into the heart of such a mystery it was necessary to accumulate further material. And the greater our experience the clearer does it become that in all cases with such traumatic experiences analysed up to the present, there co-exists a special kind of disturbance which can only be described as a derangement in the sphere of *love*. Not all of us give due credit to the anomalous nature of love, reaching high as heaven, sinking low as hell, uniting in itself all extremes of good and evil, of lofty and low.^[225]

As soon as Freud recognised this, a decisive change came about in his view. In his earlier researches, whilst more or less dominated by Charcot's trauma-theory, he had sought for the origin of the neurosis in actual traumatic experiences; but now the centre of gravity shifted to a very different point. This is best demonstrated by reference to our case; we can understand that horses might easily play a significant part in the patient's life, but it is not clear why there should be this later reaction, so exaggerated, so uncalled for. It is not her fear of horses which forms the morbid factor in this curious story; to get at the real truth we must

remember our empirical conclusion, that, side by side with traumatic experiences, there is also invariably present some disturbance in the sphere of love. We must now go on to inquire whether perhaps there is anything unsatisfactory in this respect in the case under review.

Our patient has a young man friend, to whom she is thinking of becoming engaged, she loves him and expects to be happy with him. At first nothing more is discoverable; but the investigator must not let himself be deterred by a negative result in the beginning of this preliminary questioning. When the direct way does not lead to the desired end, an indirect way may be taken. We accordingly turn our attention back to that strange moment when she ran away in front of the horses. We inquire who were her companions and what kind of social gathering was it, and find it was a farewell-party to her best friend, on her departure to a foreign health-resort on account of a nervous breakdown. We are told this friend is happily married and is the mother of one child. We may well doubt the assertion that she is happy. If she really were so, it is hardly to be supposed she would be "nervous" and in need of a cure. When I attacked the situation from a different vantage-ground, I learnt that our patient—after this episode—had been taken by her friends to the nearest safe place—her host's house. In her exhausted state he took charge of her. When the patient came to this part of her story, she suddenly broke off, was embarrassed, fidgeted and tried to turn the subject. Evidently some disagreeable reminiscences had suddenly cropped up. After obstinate resistances had been overcome, she admitted something very strange had happened that night. Her host had made her a passionate declaration of love, thus occasioning a situation that, in the absence of his wife, might well be considered both painful and difficult. Ostensibly this declaration came upon her like a "bolt from the blue." But a small dose of criticism applied to such an assertion soon apprises us that these things never do drop suddenly from the sky; they always have their previous history. It was a task of the following weeks to dig out piecemeal a long love-story. I will attempt to sketch in the picture as it appeared finally.

As a child the patient was a thorough tomboy, loved boys' boisterous games, laughed at her own sex, and would have nothing to do with feminine ways or occupations. After puberty, just when the sex-issue should have meant much to her, she began to shun all society; she seemingly hated and despised everything which could remind her even remotely of the biological

destiny of mankind, and lived in a world of phantasy which had nothing in common with rude reality. Thus, till her twenty-fourth year, she escaped all the little adventures, hopes and expectations which ordinarily move a girl at this age. But finally she got to know the two men who were destined to destroy the thorny hedge which had grown up around her. Mr. A. was her best friend's husband; Mr. B. was their bachelor-friend. She liked both; but pretty soon found B. the more sympathetic, and an intimacy grew up between them which made an engagement seem likely. Through her friendship with him and with Mrs. A., she often met Mr. A. His presence excited her inexplicably, made her nervous. Just at this time she went to a big party. All her friends were there. She became lost in thought, and in a reverie was playing with her ring, when suddenly it slipped out of her hand and rolled under the table. Both men tried to find it and Mr. B. managed to get it. With a meaning smile he put the ring back on her finger, and said, "You know what that means!" Overcome by some strange, irresistible feeling, she tore the ring from her finger and flung it out of the open window. Naturally a painful moment for all ensued, and she soon went away, much depressed. A little while after, so-called chance brought her for her summer holidays to the health-resort where A. and his wife were staying. It was then that Mrs. A. began to suffer from nerve-trouble, and frequently felt too unwell to leave the house. So our patient could often go out for walks alone with A. One day they were out in a small boat. She was boisterously merry and fell overboard. Mr. A. saved her with difficulty as she could not swim, and he managed to lift her into the boat in a half-unconscious state. Then he kissed her. This romantic event wove fast the bonds between them. In self-defence she did her best to get herself engaged to B. and to persuade herself that she loved him. Of course this queer comedy could not escape the sharp eye of feminine jealousy. Mrs. A., her friend, guessed the secret, and was so much upset by it that her nervous condition grew bad enough to necessitate her trying a cure at a foreign health-resort. At the farewell gathering the demon came to our patient and whispered: "To-night he will be alone, something must happen to you so that you can go to his house." And so indeed it came about; her strange behaviour made her friends take her to his house, and thus she achieved her desire.

After this explanation the reader will probably be inclined to assume that only diabolical subtlety could think out and set in motion such a chain of

circumstances. There is no doubt about the subtlety, but the moral evaluation is less certain. I desire to lay special emphasis upon the fact that the patient was *in no sense conscious of the motives* of this dramatic performance. The incident apparently just came about of itself without any conscious motive whatsoever. But the whole previous history makes it perfectly clear that everything was most ingeniously directed towards the other aim; whilst the conscious self was apparently working to bring about the engagement to Mr. B., the unconscious compulsion to take the other road was still stronger.

So once more we must return to our original question, whence comes the pathological, the peculiar and exaggerated reaction to the trauma? Relying on a conclusion obtained from other analogous experiences, we ventured the conjecture that in the present case we had to do with a disturbance in the love-life, in addition to the trauma. This supposition was thoroughly borne out; the trauma, which was apparently the cause of the illness, was merely the *occasion* for some factor, till then unconscious, to manifest itself. This was the *significant erotic conflict*. With this finding the trauma loses its pathogenic significance and is replaced by a much deeper and more comprehensive conception, which regards the erotic conflict as the pathogenic agent. This conception may be described as the sexual theory of the neurosis.

I am often asked why it is just the erotic conflict rather than any other which is the cause of the neurosis. There is but one answer to this. No one asserts that this ought necessarily to be the case, but as a simple matter of fact it is always found to be so, notwithstanding all the cousins and aunts, godparents, and teachers, who rage against it. Despite all the indignant assertions to the contrary, the problem and conflicts of love are of fundamental importance for humanity,^[226] and with increasingly careful study, it comes out ever more clearly that the love-life is of immensely greater importance than the individual suspects.

As a consequence of the recognition that the true root of the neurosis is not the trauma, but the hidden erotic conflict, the trauma loses its pathogenic significance.

II.—THE SEXUAL THEORY.

Thus, it will be seen, the theory had to be shifted on to an entirely different basis, for the investigation now had to face the erotic conflict itself. Our example shows that this contains extremely abnormal elements and cannot, *primâ facie*, be compared with an ordinary love conflict. It is surprising, indeed hardly credible, that only the postulated affection should be conscious, whilst the real passion remained unknown to the patient. But in this case it is beyond dispute that the real erotic relation remained unilluminated, whilst the field of consciousness was dominated by the assumption. If we try to formulate this fact, something like the following proposition results: *in a neurosis*, two erotic tendencies exist which stand in extreme opposition to one another, and one at least is unconscious. Against this formula the objection can be raised that it has obviously been derived from this one particular case, and is therefore lacking in general validity. The criticism will be the more readily urged because no one unpossessed of special reasons is willing to admit that the erotic conflict is of universal prevalence. On the contrary, it is assumed that this conflict belongs more properly to the sphere of novels, since it is generally depicted as something in the nature of such wild adventures as are described by Karin Michaelis in her "Aberrations of Marriage," or by Forel in "The Sexual Question." But indeed this is not the case; for we know the wildest and most moving dramas are not played on the stage, but every day in the hearts of ordinary men and women who pass by without exciting attention, and who betray to the world, save through the symbol of a nervous breakdown, nothing of the conflicts that rage within them. But what is so difficult for the layman to grasp is the fact that in most cases patients have no suspicion whatever of the internecine war raging in their unconscious. But remembering that there are many people who understand nothing at all about themselves, we shall be less surprised at the realisation that there are also people who are utterly unaware of their actual conflicts.

If the reader is now inclined to admit the possible existence of pathogenic, and perhaps even of unconscious conflicts, he will certainly protest that they are not erotic conflicts. If this kind reader should happen himself to be somewhat nervous, the mere suggestion will arouse his indignation, for we are all inclined, as a result of our education in school and at home, to cross ourselves three times where we meet such words as "erotic" and "sexual"—and so we are conveniently able to think that nothing of that nature exists,

or at least very seldom, and at a great distance from ourselves. But it is just this attitude which in the first instance brings about neurotic conflicts.

We recognise that the course of civilisation consists in the progressive mastering of the animal element in man; it is a process of domestication which cannot be carried through without rebellion on the part of the animal nature still thirsting for its liberty. Humanity forces itself to endure the restrictions of the civilising process; but from time to time there comes a frenzied bursting of all bonds. Antiquity had experience of it in that wave of Dionysian orgies, surging hither from the East, which became an essentially characteristic element of antique culture. Its spirit was partly instrumental in causing the numerous sects and philosophic schools of the last century before Christ, to develop the Stoic ideal into asceticism; and in producing from the polytheistic chaos of those times, the ascetic twin-religions of Mithras and of Christ. A second clearly marked wave of the Dionysian impulse towards freedom swept over the Western world during the Renaissance. It is difficult to judge of one's own time, but we gain some insight if we note how the Arts are developing, what is the prevailing type of public taste, what men read and write, what societies they found, what "questions" are the order of the day, and against what the Philistines are fighting. We find in the long list of our present social problems that the sexual question occupies by no means the last place. It agitates men and women who would shake the foundations of sexual morality, and throw off the burden of moral shame which past centuries have heaped upon Eros. The existence of these aspirations and endeavours cannot be simply denied, or declared indefensible; they exist and are therefore presumably not without justification. It is both more interesting and more useful to study carefully the basic causes of these movements than to chime in with the lamentations of the professional mourners over morals, who prophesy with unction the moral downfall of humanity. The moralist least of all trusts God, for he thinks that the beautiful tree of humanity can only thrive by dint of being pruned, bound, and trained on a trellis, whereas Father-Sun and Mother-Earth have combined to make it grow joyfully in accordance with its own laws, which are full of the deepest meaning.

Serious people are aware that a very real sexual problem does exist at the present time. The rapid development of the towns, coupled with methods of work brought about by the extraordinary division of labour, the increasing

industrialisation of the country and the growing security of life, combine to deprive humanity of many opportunities of expending emotional energy. Think of the life of the peasant, whose work so rich and full of change, affords him unconscious satisfaction by means of its symbolic content; a like satisfaction the factory-hand and the clerk can never know. Think of a life with nature; of those wonderful moments when, as lord and fructifier, man drives the plough through the earth, and with kingly gesture scatters the seed of the future harvest; see his justifiable awe before the destructive power of the elements, his joy in the fruitfulness of his wife, who gives him daughters and sons, who mean to him increased working power and enhanced prosperity. Alas! from all this we town-dwellers, we modern machines, are far, far removed.

Must we not admit that we are already deprived of the most natural and most beautiful of all satisfactions, since we can no longer contemplate the arrival of our own seed, the "blessing" of children, with unmixed pleasure? Marriages where no artifices are resorted to are rare. Is this not an all-important departure from the joys which Mother Nature gave her first-born sons? Can such a state of affairs bring satisfaction? Note how men slink to their work, watch their faces at an early morning hour in the tram-cars. One of them makes his little wheels, and another writes trivial things which do not interest him. What wonder is it if such men belong to as many clubs as there are days in the week, and that among women little societies flourish, where they pour out on some particular hero or cause those unsatisfied desires which the man dulls at his restaurant or club, imbibing beer and playing at being important? To these sources of dissatisfaction is added a more serious factor. Nature has provided defenceless, weaponless man with a great amount of energy to enable him not merely to bear passively the grave dangers of existence, but also to conquer them. Mother Nature has equipped her son for tremendous hardships and has placed a costly premium on the overcoming of them, as Schopenhauer quite understood when he said that "happiness is really but the termination of unhappiness." Civilized people are, as a rule, shielded from the immediately pressing dangers, and they are therefore daily tempted to excess, for in man the animal always becomes rampant when he is not constrained by fierce necessity. Are we then indeed unrestrained? In what orgiastic festivals do we dispose of the surplus of vital power? Our moral views do not permit us that outlet.

But reckon up in how many directions we are met by unsatisfied longings; the denial of procreation and begetting, for which purpose nature has endowed us with great energy; the unending monotony of our highly developed modern methods of "division of labour," which excludes any interest in the work itself; and above all our effortless security against war, lawlessness, robbery, epidemics, infant and woman mortality—all this gives a sum of surplus energy which must needs find an outlet. But how? A relatively few create quasi-natural dangers for themselves in reckless sport; many more, seeking to find some equivalent for their more primitive energy, take to alcoholic excess; others expend themselves in the rush of money-making, or in the morbid performance of duties, in perpetual over-work. By such means they try to escape a dangerous storing-up of energy which might force mad outlets for itself. It is for such reasons that we have to-day a *sexual question*. It is in this direction that men's energy would like to expend itself as it has done from time immemorial in periods of security and abundance. Under such circumstances it is not only rabbits that multiply; men and women, too, become the sport of these accesses of nature: the sport, because their moral views have confined them in a narrow cage, the excessive narrowness of which was not felt so long as harsh external necessity pressed upon them with even greater constraint. But now the man of the cities finds the space too circumscribed. He is surrounded by alluring temptation, and like an invisible *procureur* there slinks through society the knowledge of preventive methods which evade all consequences. Why then moral restraint? Out of religious consideration for an angry God? Apart from the prevalence of widespread unbelief, even the believing man might quietly ask himself whether, if he himself were God, he would punish the youthful erotic uncontrol of John and Mary with twice twenty-four years of imprisonment and seething in boiling oil. Such ideas are no longer compatible with our decorous conception of God. The God of our time is necessarily much too tolerant to make a great fuss over it; (knavishness and hypocrisy are a thousand times worse). In this way the somewhat ascetic and hypocritical sexual morality of our time has had the ground cut from under its feet. Or is it the case that we are now protected from dissoluteness by superior wisdom, recognition of the nothingness of human happenings? Unfortunately we are very far from that; rather does the hypnotic power of tradition keep us in bonds, and through cowardice and thoughtlessness and habit the herd goes tramping on in this same path. But

man possesses in the unconscious a fine scent for the spirit of his time; he has an inkling of his own possibilities and he feels in his innermost heart the instability of the foundations of present-day morality, no longer supported by living religious conviction. It is thus the greater number of the erotic conflicts of our time originate. Instinct thirsting for liberty thrusts itself up against the yielding barriers of morality: men are tempted, they desire and do not desire. And because they will not and cannot think out to its logical conclusion what it is they really desire, their erotic conflict is largely unconscious; whence comes neurosis. Neurosis then is most intimately bound up with the problem of our times and represents an unsuccessful attempt of the individual to solve the general problem in his own person. Neurosis is a tearing in two of the *inner self*. For most men the reason of this cleavage is the fact that their conscious self desires to hold to its moral ideal, whilst the unconscious strives after the amoral ideal, steadfastly rejected by the conscious self. People of this kind would like to appear more decent than they really are. But the conflict is often of an opposite kind. There are those who do not outwardly live a decent life at all and do not place the slightest constraint upon their sexuality, but in reality this is a sinful pose assumed for goodness knows what reasons, for down below they have a decorous soul which has somehow gone astray in their unconscious, just as has the real immoral nature in the case of apparently moral people. Extremes of conduct always arouse suspicions of the opposite tendencies in the unconscious.

It was necessary to make this general statement in order to elucidate the idea of the "erotic conflict" in analytical psychology, for it is the key to the conception of neurosis. We can now proceed to consider the psychoanalytic technique. Obviously the main problem is, how to arrive by the shortest and best path at a knowledge of the patient's "unconscious." The method first used was hypnotism, the patient being questioned, on the production of spontaneous phantasies observed while in a state of hypnotic concentration. This method is still occasionally used, but in comparison with the present technique is primitive and frequently unsatisfactory. A second method, evolved by the Psychiatric Clinic, Zürich, was the so-called association method,^[227] which is chiefly of theoretic, experimental value. Its result is an extensive, though superficial orientation, concerning the unconscious

conflict ("complex").^[228] The more penetrating method is that of dream-analysis whose discovery belongs to Sigmund Freud.^[229]

Of the dream it can be said that "the stone which the builders rejected has become the head of the corner." It is only in modern times that the dream (that fleeting and seemingly insignificant product of the soul), has met with such complete contempt. Formerly it was esteemed, as a harbinger of fate, a warning or a consolation, a messenger of the gods. Now we use it as a messenger of the unconscious; it must disclose to us the secrets which our unconscious self enviously hides from our consciousness, and it does so with astonishing completeness.

On analytical investigation it becomes plain that the dream, as we remember it, is only a façade which conceals the contents within the house. But if, observing certain technical rules, we get the dreamer to talk about the details of his dream, it soon appears that his free associations group themselves in certain directions and round certain topics. These appear to be of personal significance, and have a meaning which at first sight would not be suspected. Careful comparison shows that they are in close and subtle symbolic connection with the dream-façade.^[230] This particular complex of ideas in which all the threads of the dream unite, is the conflict for which we are seeking; is its particular form at the moment, conditioned by the immediate circumstances. What is painful and incompatible is in this way so covered up or split that we can call it a wish-fulfilment; but we must immediately add that the wishes fulfilled in the dream do not seem at first sight to be *our* wishes, but rather the very opposite. For instance, a daughter loves her mother tenderly, but she dreams that her mother is dead; this causes her great grief. Such dreams, where apparently there is no trace of any wish-fulfilment are innumerable, and are a constant stumbling-block to our learned critics, for—*incredible dictu*—they still cannot grasp the simple distinction between the *manifest* and the *latent* content of the dream. We must guard against such an error; the conflict dealt with in the dream is an unconscious one, and equally so also is the manner its solution. Our dreamer has, as a matter of fact, the wish to get away from her mother—expressed in the language of the unconscious, she wants her mother to die. Now we know that a certain section of the unconscious contains all our lost memories, and also all those infantile impulses that cannot find any application in adult life—a series, that is, of ruthless childish desires. We

may say that for the most part the unconscious bears an infantile stamp; like the child's simple wish: "Daddy, when Mummie is dead, will you marry me?" In a dream that infantile expression of a wish is the substitute for a recent wish to marry, which is painful to the dreamer for reasons still undiscovered. This thought, or rather the seriousness of its corresponding intention, is said to be "repressed into the unconscious" and must there necessarily express itself in an infantile way, for the material which is at the disposal of the unconscious consists chiefly of infantile memories. As the latest researches of the Zürich school have shown,^[231] these are not only infantile memories but also "racial" memories, extending far beyond the limits of individual existence.

Important desires which have not been sufficiently gratified, or have been "repressed," during the day find their symbolic substitution in dreams. Because moral tendencies usually predominate in waking hours, these ungratified desires which strive to realise themselves symbolically in the dream are, as rule, erotic ones. It is, therefore, somewhat rash to tell dreams before one who understands, for the symbolism is often extremely transparent to him who knows the rules! The clearest in this respect are "anxiety-dreams" which are so common, and which invariably symbolise a strong erotic desire.

Often the dream apparently deals with quite irrelevant details, thereby making a ridiculous impression; or else it is so unintelligible that we are simply amazed at it, and accordingly have to overcome considerable resistance in ourselves before we can set to work seriously to unravel its symbolic weaving by patient work. But when at last we penetrate into its real meaning we find ourselves at a bound in the very heart of the dreamer's secrets, and find to our astonishment that an apparently senseless dream is quite full of sense, and deals with extraordinarily important and serious problems of the soul. Having acquired this knowledge we cannot refrain from giving rather more credit to the old superstitions concerning the meaning of dreams for which our rationalising tendencies, until lately, had no use.

As Freud says: "Dream-analysis is the *via regia* to the unconscious." Dream-analysis leads us into the deepest personal secrets, and it is therefore an invaluable instrument in the hand of the psychotherapist and educator.

The objections of the opponents of this method are based, as might be expected, upon argument, which (setting aside undercurrents of personal feeling) show the bias of present-day Scholasticism. It so happens that it is just the analysis of dreams which mercilessly uncovers the deceptive morals and hypocritical affectations of man, and shows him the under side of his character; can we wonder if many feel that their toes have been rather painfully trodden upon? In connection with the dream-analysis I am always reminded of the striking statue of Carnal Pleasure in Bâle Cathedral, which shows in front the sweet smile of archaic sculpture, but behind is covered with toads and serpents. Dream-analysis reverses the figure and for once shows the other side. The ethical value of this reality-correction (Wirklichkeitscorrectur) cannot be disputed. It is a painful but extremely useful operation, which makes great demands on both physician and patient.

Psychoanalysis, in so far as we are considering it as a therapeutic technique, consists mainly of the analysis of many dreams; the dreams in the course of the treatment bringing up successively the contents of the unconscious in order that they may be subjected to the disinfecting power of daylight, and in this process many a valuable thing believed to have been lost is found again. It is not surprising that for those persons who have adopted a certain pose towards themselves, psychoanalysis is at times a real torture, since in accordance with the old mystic saying, "Give all thou hast, then only shalt thou receive," there is first the necessity to get rid of almost all the dearly cherished illusions, to permit the advent of something deeper, finer, and greater, for only through the mystery of self-sacrifice is it possible to be "born-again." It is indeed ancient wisdom which again sees the daylight in psychoanalytic treatment, and it is a curious thing that this kind of psychic re-education proves to be necessary at the height of our modern culture; this education which in more than one respect can be compared to the technique of Socrates, even though psychoanalysis penetrates to much greater depths.

We always find in a patient some conflict, which at a particular point, is connected with the great problems of society; so that when the analysis has arrived at this point the apparently individual conflict is revealed as a universal conflict of the environment and the epoch. Neurosis is thus, strictly speaking, nothing but an individual attempt, however unsuccessful, at a solution of the general problem; it must be so, for a general problem, a

"question," is not an end in itself; it only exists in the hearts and heads of individual men and women. The "question" which troubles the patient is—whether you like it or not—the "sexual" question, or more precisely, the problem of present-day *sexual morality*. His increased demands upon life and the joy of life, upon glowing reality, can stand the necessary limitations which *reality* sets, but not the arbitrary, ill-supported prohibitions of present-day morals, which would curb too much the creative spirit rising up from the depths of the darkness of the beasts that perish. For the *neurotic has in him the soul of a child* that can but ill-endure arbitrary limitations of which it does not see the meaning; it tries to adopt the moral standard, but thereby only falls into deeper disunion and distress within itself. On the one hand it tries to suppress itself, and on the other to free itself—this is the struggle that is called Neurosis. If this conflict were altogether clear to consciousness it would of course never give rise to neurotic symptoms; these only arise when we cannot see the other side of our character, and the urgency of the problems of that other side. In these circumstances symptoms arise which partially express what is unrecognised in the soul. The symptom is, therefore, an indirect expression of unrecognised desires, which, were they conscious, would be in violent opposition to the sufferer's moral views. As we have already said, this dark side of the soul does not come within the purview of consciousness, and therefore the patient cannot deal with it, correct it, resign himself to it, or renounce it, for he cannot be said to *possess* the unconscious impulses. By being repressed from the hierarchy of the conscious soul, they have become *autonomous complexes* which can be brought again under control by analysis of the unconscious, though not without great resistance. There are a great many patients whose great boast it is that the erotic conflict does not exist for them; they are sure that the sexual question is nonsense, that they have, so to say, no sexuality. These people do not see that other things of unknown origin cumber their path, such as hysterical whims, underhand tricks, from which they make themselves, or those nearest them, suffer; nervous stomach-catarrh, pain here and there, irritability without reason, and a whole host of nervous symptoms. All which things show what is wrong with them, for relatively, only a few specially favoured by fate, avoid the great conflict.

Analytical psychology has already been reproached with setting at liberty the animal instincts of men, hitherto happily repressed, and causing thereby untold harm. This childish apprehension clearly proves how little trust is

put in the efficacy of present-day moral principles. It is pretended that only morals can restrain men from dissoluteness; a much more efficient regulator, however, is *necessity*, which sets much more real and convincing bounds than any moral principles. It is true that analysis liberates animal instincts, but not, as some have said, just in order to let them loose, but rather to make them available for higher application, in so far as this is possible to the particular individual, and in so far as such "sublimated" application is required. Under all circumstances it is an advantage to be in full possession of one's own personality, for otherwise the repressed desires will get in the way in a most serious manner, and overthrow us just in that place where we are most vulnerable. It is surely better that a man learn to tolerate himself, and instead of making war on himself convert his inner difficulties into real experiences, rather than uselessly repeat them again and again in phantasy. Then at least he lives, and does not merely consume himself in fruitless struggles. But when men are educated to recognise the baser side of their own natures, it may be hoped they will learn to understand and love their fellow-men better too. A decrease of hypocrisy and an increase of tolerance towards oneself, can have only good results in tolerance towards one's neighbours, for men are only too easily disposed to extend to others the unfairness and violence which they do to their own natures.

Freud's theory of repression does, indeed, seem to postulate the existence only of people who, being too moral, are continually repressing the immorality of their natural instincts. According to this idea, the immoral man who allows his natural instincts an unbridled existence should be proof against neurosis. But daily experience proves this is obviously not the case; he may be just as neurotic as other men. If we analyse him, we find that it is simply his decency that has been repressed. Therefore, when an immoral man is neurotic, he represents what Nietzsche appropriately described as "the pale criminal," a man who does not stand upon the same level as his deed.^[232]

The opinion may be held, that in such a case the repressed remnants of decency are merely infantile traditional legacies, that impose unnecessary fetters upon natural instincts, for which reason they should be eradicated. The principle "écraser l'infâme" would be the natural culmination of such an absolute let-instinct-live theory.^[233] That would obviously be quite

phantastic and nonsensical. It should, indeed, never be forgotten—and the Freudian School needs this reminder—that morality was not brought down upon tables of stone from Sinai and forced upon the people, but that morality is a function of the human soul, which is as old as humanity itself. Morality is not inculcated from without. Man has it primarily within himself—not the law indeed, but the essence of morals.

After all, does a more moral view-point exist than the let-instinct-live theory? Is there a more heroic morality than this? That is why Nietzsche, the heroic, is especially partial to it. It is natural and inborn cowardice that makes people say, "God preserve me from following my instincts," thinking that they thus prove their high moral standard. They do not understand that following one's bent is really much too costly for them, too strenuous, too dangerous, and finally it cuts somewhat against that sense of decency which most people associate rather with taste than with a categorical imperative. The unpardonable fault of the let-instinct-live theory is, that it is much too heroic, too ideologic for the multitude.

There is, therefore, probably no other way for the immoral man but to accept the moral corrective of his unconscious, just as he who is moral must come to terms as best he may, with his demons of the netherworld. It cannot be gainsaid that the Freudian School is so convinced of the fundamental, and even exclusive importance of sexuality in neurosis, that it has been courageous enough to face the consequences of its convictions by heroically attacking the sexual morality of the present day. Many different opinions prevail upon this subject. What is significant is, that the problem of sexual morality is being widely discussed at the present time. This is doubtless both useful and necessary, for hitherto we have not really had any sexual morality at all, but merely a low barbaric view, quite insufficiently differentiated. In the Middle Ages, usury was considered absolutely despicable, for at that time the morality of finance was not casuistically differentiated; there was nothing but a kind of lump-morality. So nowadays, there exists nothing but sexual morality in the lump. A girl who has an illegitimate child is condemned, without any inquiry as to whether she is a decent person or not. Any form of love that has no legal sanction is immoral, no matter whether it occurs between thoughtful people of value or irresponsible scamps. People are still barbarically hypnotised by the thing itself, to such an extent that they forget the individual.

Therefore the discussion of and attack upon sexual morality of the present day signifies at bottom, a moral deed, constraining people towards a differentiated and really ethical conception of the subject.

As already stated, Freud sees the great conflict between the ego and natural instinct chiefly under its sexual aspect. This aspect does exist, but a big query should be placed behind its actuality. The question is whether what appears in a sexual form must always essentially be sexuality? It is conceivable that one instinct may disguise itself under another. Freud himself has supplied several notable instances of such a disguise, proving therewith, convincingly, that many of the deeds and aims of human kind are, at bottom, nothing but somewhat figurative expressions substituted, on account of embarrassment, in place of important elementary things. The substitution is not seen through on account of reasons of mutual consideration. There is nothing to hinder certain elementary things being also pushed conveniently into the foreground, in place of more necessary but less pleasant ones, under the illusion that the elementary things only are really in question.

The theory of sexuality although one-sided is absolutely right up to a certain point. It would, therefore, be just as false to repudiate it as to accept it as universally valid.

III.—THE OTHER VIEWPOINT: THE WILL TO POWER.

We have so far considered the problem of the psychology of unconscious processes mainly from the point of view of Freud. We have thereby doubtless gained an inkling of a real truth, which perhaps our pride, our consciousness of civilisation, tries to deny, although something else in us affirms it. This situation is extremely irritating to some people, arousing resistances, and at the same time they are terror-stricken by it, a fact which they are most unwilling to acknowledge. There is something terrible in admitting this conflict, for it is an acknowledgment of being swayed by instinct. Has it ever been understood what it means to confess to the sway of instinct? Nietzsche desired to be so swayed and advocated it most seriously. He even sacrificed himself throughout his whole life, with rare passion, to the idea of the Superman, that is to the idea of the man who, obeying his instincts, transcends even his very self. And what was the

course of his life? It turned out as Nietzsche himself prophesied in the passage in "Zarathustra" relating to the fatal fall of the rope-dancer, of the man who did not want to be "surpassed." Zarathustra says to the dying rope-dancer: "Thy soul will be dead even sooner than thy body." And later, the dwarf says to Zarathustra: "Oh, Zarathustra, thou stone of wisdom! Thou threwest thyself high, but every thrown-stone must fall! Condemned of thyself, and to thine own stoning: oh, Zarathustra, far indeed threwest thou the stone—but upon *thyself* will it recoil!"

When he cried his "ecce homo" over himself, it was again too late, and the crucifixion of the soul began even before the body was dead. He who thus taught *yea-saying* to the instincts of life, must have his own career looked at critically, in order to discover the effects of this teaching upon the teacher. But if we consider his life from this point of view, we must say that Nietzsche lived *beyond instinct*, in the lofty atmosphere of heroic "sublimity." This height could only be maintained by means of most careful diet, choice climate and above all by many opiates. Finally, the tension of this living shattered his brain. He spoke of *yea-saying*, but lived the nay. His horror of people, especially of the animal man, who lives by instinct, was too great. He could not swallow the toad of which he so often dreamt, and which he feared he must yet gulp down. The Zarathustrian lion roared all the "higher" men, who craved for life, back into the cavernous depths of the unconscious. That is why his life does not convince us of the truth of his teaching. The "higher man" should be able to sleep without chloral, and be competent to live in Naumburg or Basle despite "the fogs and shadows." He wants woman and offspring; he needs to feel he has some value and position in the herd, he longs for innumerable commonplaces, and not least for what is humdrum: it is this instinct that Nietzsche did not recognise; it is, in other words, the natural animal instinct for life.

But how did he live if it was not from natural impulse? Should Nietzsche really be accused of a practical denial of his natural instincts? He would hardly agree to that; indeed he might even prove, and that without difficulty, that he really was following his instincts in the highest sense. But we may well ask how is it possible that human instincts could have led him so far from humanity, into absolute isolation, into an aloofness from the herd which he supported with loathing and disgust? One would have thought that instinct would have united, would have coupled and begot, that it would

tend towards pleasure and good cheer, towards gratification of all sensual desires. But we have quite overlooked the fact that this is only one of the possible directions of instinct. There exists not only the instinct for the preservation of the species (the sexual instinct), but also the instinct for the preservation of the self.

Nietzsche obviously speaks of this latter instinct, that is of *the will to power*. Whatever other kinds of instinct may exist are for him only a consequence of the will to power. Viewed from the standpoint of Freud's sexual-psychology this is a gross error, a misconception of biology, a bad choice made by a decadent neurotic human being. For it would be easy for any adherent of sexual psychology to prove that all that was too lofty, too heroic, in Nietzsche's conception of the world and of life, was nothing but a consequence of the repression and misconception of "instinct," that is of the instinct that *this* psychology considers fundamental.

This brings us to the *question of perception*, or rather it were better to say of the various lenses through which the world may be perceived. For it would hardly be permissible to pronounce a judgment on a life like Nietzsche's. It was lived with rare consistency, from the beginning to the fateful end, in accordance with his underlying natural fundamental instinct for power. It would hardly do to pronounce it to be merely figurative, otherwise we should make the same unjust condemnation that Nietzsche pronounced upon his polar opposite Richard Wagner, of whom he said, "*Everything in him is false; what is genuine is hidden or disguised. He is an actor, in every bad and good meaning of the word.*" Why this judgment? Wagner is a precise representative of that other fundamental instinct, which Nietzsche overlooked, and upon which Freud's psychology is based. If we inquire whether the other main instinct—that of power—was unconsidered by Freud, we shall find that he has included it under the name of the "ego instinct." But these ego instincts drag out an obscure existence, according to his psychology, alongside the broad, all-too-broad, development of the sexual theme. In reality, however, human nature wages a cruel and hardly-to-be-ended warfare between the ego-principle and that of formless instinct. The ego is all barriers; instinct, on the other hand, is without any limits. Both principles are equally powerful. In a certain sense men may account themselves fortunate in being conscious of only one instinct: therefore he who is wise avoids getting to know the other. But if, after all, he does get to

know the other instinct, he is indeed a lost man. For then he enters upon the Faustian conflict. Goethe has shown us in the first part of "Faust" what the acceptance of instinct involves, and in the second part, what the acceptance of the ego and of his gruesome unconscious world would signify. Everything that is insignificant, *petty*, and cowardly in us shrinks from it, and would avoid it—and there is one admirable means of doing so. Namely, by discovering that the other thing in us is "another fellow," a live man who actually thinks, feels, does and desires all the things that are despicable and odious. In this way the bogey is seized, and the battle against him is begun to our satisfaction. Hence arise, also, those chronic idiosyncrasies of which the history of morals has preserved a few examples for us. The instance of Nietzsche contra Wagner, already cited, is particularly transparent. But ordinary human life is crammed full of such cases. It is by these ingenuous devices that man saves himself from the Faustian catastrophe for which he evidently lacks both courage and strength. But a sincere man knows that even his bitterest opponent, or any number of them, does not by any means equal his one worst adversary, that is his other self who "bides within his breast." Nietzsche unconsciously had Wagner *in himself*, that is why he envied him his Parsifal. But even worse, he was a Saul and also had Paul within. That is why Nietzsche became a stigmatised outcast of the Spirit; he had like Saul to experience Christification when "the other self" inspired him with his "ecce homo." Which man in him "broke down before the cross," Wagner or Nietzsche?

It was ordained by destiny that one of Freud's earliest pupils, Adler,^[234] should formulate a view of neurosis as founded exclusively upon the principle of power. It is interesting and even fascinating to observe how totally different the same things appear when viewed in another light. In order to emphasise the main contrast, I would like at once to draw attention to the fact that, according to Freud, everything is a strictly causal consequence of previously-occurring facts; Adler, on the contrary, sees everything as a finally conditioned arrangement. To take a simple example: A young woman begins to have attacks of terror. She wakes at night from some nightmare with a piercing cry; calming herself with difficulty, she clings to her husband, imploring him not to leave her, making him repeat again and again that he loves her, etc. Gradually a nervous asthma develops, attacks of which also come on during the day.

In such a case, the Freudian system begins at once to burrow in the inner causality of the illness: What did the initial anxiety-dreams contain. She recalls wild bulls, lions, tigers, bad men. What does the patient associate with them? She told a story of something that had happened to her when she was still single. It ran as follows: She was staying at a summer-resort in the mountains, a great deal of tennis was played, the usual acquaintances being made. There was a young Italian who played particularly well, and who also knew how to handle the guitar in the evenings. A harmless flirtation developed, leading once to a moon-light walk. On this occasion, the Italian temperament "unexpectedly" broke through, running away with the young man to the great terror of the unsuspecting girl. He "looked at her with such a look," that she could never forget it. This look follows her even in her dreams; the wild animals that persecuted her had it. As a matter of fact, does this look originally come from the Italian? Another reminiscence enlightens us. The patient had lost her father through an accident, when she was about fourteen years old. The father was a man of the world, and travelled a great deal. Not long before his death he took her to Paris, where, among other things, they visited the *Follies Bergères*. Something happened there that at the time made a deep impression upon her. As they were leaving the theatre, a rouged female suddenly pressed close up to her father in an impertinent way. She looked at her father in fear as to what he would do—and then she saw that look, that animal glare in his eyes. An inexplicable something clung to her day and night. From this moment her attitude to her father was quite changed. At one instant she was irritable and full of venomous moods, at another she loved him extravagantly; then causeless fits of crying suddenly began, and, for a time, whenever her father was at home, she was tormented by terrible choking at table, with apparent attacks of suffocation, which were usually followed by voicelessness lasting from one to two days. When the news of her father's sudden death arrived, she was overcome by uncontrolled grief ending in hysterical laughter. But she soon calmed down, her condition improving quickly, and the neurotic symptoms disappearing almost completely. It seemed as if a veil of forgetfulness had descended over the past. Only the experience with the Italian roused something in her of which she was afraid. She had broken off completely with the young man. A few years later she married. The present neurosis only began after the birth of her second child, that is at the moment

when she discovered that her husband took a certain tender interest in another woman.

This history raises a number of questions. For instance, what do we know about the mother? It should be said of her that she was very nervous, and had tried many kinds of sanatoria and systems of cure. She also had symptoms of fear and nervous asthma. The relations between her and her husband had been very strained as far back as the patient could remember. The mother did not understand the father; the daughter always felt that she understood him better. She was moreover her father's declared favourite, being inwardly correspondingly cool towards her mother.

These facts are indications for a survey of the meaning of the illness. Behind the present symptoms phantasies are operative, connected in the first place with the young Italian, but further clearly referring to the father, whose unhappy marriage furnished the little daughter with an early opportunity of acquiring a position that really should have been filled by her mother. Behind this conquest there lies, of course, a phantasy of being the woman who was really suited to her father. The first attack of neurosis broke out at the moment when this phantasy received a violent shock, presumably similar to that the mother had once experienced (a fact that was, however, unknown to the child). The symptoms are easily comprehensible as the expression of disappointed and rejected love. The choking is based upon a sensation of tightening in the throat that is a well-known accompanying phenomenon of violent effects which we cannot quite "swallow." The metaphors of language often refer to similar physiological occurrences. When the father died, it seemed that her consciousness sorrowed deeply but her unconscious laughed, after the manner of Till Eulenspiegel, who was sad when he went downhill but was jolly when climbing laboriously, happy in anticipation of what was coming. When the father was at home the girl was low-spirited and ill, but whenever he was away she felt much better. Herein she resembles numerous husbands and wives who as yet are mutually hiding from each other the secret that they are not under all circumstances indispensable to one another.

That the unconscious had some right to laugh was shown by the subsequent period of good health. She succeeded in letting all that had passed retire behind the trap-door. The experience with the Italian, however, threatened to bring the netherworld up again. But she quickly pulled the handle and shut the door. She remained quite well until the dragon of neurosis came creeping in, just when she imagined herself to be already safely out of her

troubles, in the so-to-say perfected state of wife and mother. Sexual psychology finds the cause of the neurosis in the fact that the patient is not at bottom free from the father. This forces her to resuscitate her former experience at the moment when she discovered in the Italian the very same disturbing something that had formerly made such a deep impression upon her when perceived in her father. These recollections were naturally revived by the analogous experience with another man, and formed the starting-point of the neurosis. It might therefore be said that the content and cause of the neurosis lay in the conflict between the phantastic infantile-erotic relation to the father on the one hand, and her love for the husband on the other.

But if we now consider the course of the same illness from the standpoint of the other instinct, that is, of the will to power, a different complexion is put upon the matter. Her parents' unhappy marriage afforded an excellent opportunity for the exhibition of childish instinct for power. The instinct for power desires that, under all circumstances, the ego should be "on top," whether by straight or crooked means. At all costs the integrity of the personality must be preserved.

Every attempt, even what appears to be an attempt of the surroundings, to bring about the slightest subjection of the individual, is retorted to by the "masculine protest," as Adler expresses it. The mother's disappointment and her taking refuge in a neurosis brought about an opportunity for the development of power and the attainment of a dominating position. Love and excellence of conduct are, as everybody knows, extremely well-adapted weapons for the purposes of the instinct for power. Virtue is not seldom made the means of *forcing* recognition from others. Already as a child she knew how to obtain a privileged position with her father by means of specially pleasing and amiable behaviour, even occasionally to supplant her mother. This was not out of love for her father, although love was a good means of obtaining the coveted superiority. The hysterical laughter at the death of her father is a striking proof of this fact. One is inclined to consider such an explanation as a deplorable depreciation of love, if not actually a malicious insinuation. But let us pause a moment, reflect, and look at the world as it really is. Have we never seen those innumerable people who love, and believe in their love, only until its purpose is achieved, and who then turn away as if they had never loved? And, after all, does not Nature

herself do the same? In fact, is a "purposeless" love possible? If so, it belongs to the highest human virtues, which confessedly are extremely rare. Perhaps there is a general disposition to reflect as little as possible about the nature and purpose of love; discoveries might be made which would show the value of one's own love to be less considerable than we had supposed. However, it were dangerous to life to subtract anything from the value of fundamental instincts, perhaps specially so to-day, when we seem to have only a minimum of values left.

So the patient had an attack of hysterical laughter at the death of her father; she had finally arrived at the top. It was hysterical laughter, therefore a psychogenic symptom, that is, something proceeding from unconscious motives and not from those of the conscious ego. That is a difference that should not be underrated, for it enables us to recognise whence and how human virtues arise. Their contraries led to hell, that is, in modern terms, to the unconscious, where the counterparts of our conscious virtue have long been gathering. That is why our very virtue makes us desire to know nothing of the unconscious; indeed, it is even the summit of virtuous wisdom to maintain that there is no unconscious at all. But unfortunately we are all in a like predicament with Brother Medardus in E. T. A. Hoffman's "The Elixir of the Devil": somewhere or other there exists a sinister, terrible brother, our own incarnate counterpart bound to us by flesh and blood, who comprehends everything, maliciously hoarding whatever we most desire should disappear beneath the table.

The first outbreak of neurosis occurred in our patient at the moment when she became aware of the fact that there was something in her father which she did not control. And then it dawned upon her of what use her mother's neurosis was. When one meets with an obstacle that cannot be overcome by sensible and charming means, there yet exists an arrangement hitherto unknown to her which her mother had been beforehand in discovering, and that is neurosis. That is the reason why she now imitates her mother. But, the astonished reader asks, what is supposed to be the use of neurosis? What does it effect? Whoever has had a pronounced case of neurosis in his immediate environment, knows all that can be "effected" by a neurosis. In fact, there is altogether no better means of tyrannising over a whole household than by a striking neurosis. Heart attacks, choking fits, convulsions of all kinds achieve enormous effects, that can hardly be

surpassed. Picture the fountains of pity let loose, the sublime anxiety of the dear kind parents, the hurried running to and fro of the servants, the incessant sounding of the call to the telephone, the hasty arrival of the physicians, the delicacy of the diagnosis, the detailed examinations, the lengthy courses of treatment, the considerable expense; and there, in the midst of all the uproar, lies the innocent sufferer, to whom the household is even overflowingly grateful, when he has recovered from the "spasms."

The girl discovered this incomparable "arrangement" (to use Adler's term), applying it on occasion when the father was there with success. It became unnecessary when the father died, for now she was finally uppermost. The Italian was soon dismissed, because he laid too much stress upon her femininity by an inopportune reminder of his manliness. When the way opened to the possibility of a suitable marriage, she loved, adapting herself without any complaint to the deplorable rôle of the queen bee. As long as she held the position of admired superiority, everything went splendidly. But when her husband evinced a small outside interest, she was obliged again to have recourse to the extremely efficacious "arrangement," that is, to the indirect application of power, because she had once again come upon that thing—this time in her husband—that had already previously withdrawn her father from her influence.

That is how the matter appears from the standpoint of the psychology of power. I fear that the reader will feel as did the Kadi, before whom the counsel of one party spoke first. When he had ended, the Kadi said: "Thou hast spoken well. I perceive that thou art right." Then spoke the counsel for the other party, and when he had ended, the Kadi scratched himself behind his ear and said: "Thou hast spoken well. I perceive that thou also art right." There is no doubt that the instinct for power plays a most extraordinary part. It is true that the complexes of neurotic symptoms are also exquisite "arrangements," that inexorably realise their aims with incredible obstinacy and unequalled cunning. The neurosis is final; that is, it is directed towards an aim. Adler merits considerable distinction for having demonstrated this.

Which of the two points of view is right? That is a question that might well cause much brain-racking. For the two explanations cannot be simply combined, being absolutely contradictory. In one case, it is love and its course that is the principal and decisive fact; and in the other case, it is the power of the ego. In the first case the ego is merely a kind of appendage to

the passion for love; and in the second love is upon occasion merely a means to the end, that of gaining the upper hand. Whoever has the power of the ego most at heart rebels against the former conception, whilst he who cares most about love, will never be able to be reconciled to the latter.

IV.—THE TWO TYPES OF PSYCHOLOGY.

It is at this point that our most recent researches may suitably be introduced. We have found, in the first place, that there are two types of human psychology.^[235] In the one type the fundamental function is feeling, and in the other it is thought. The one feels his way into the object, the other thinks about it. The one adapts himself to his surroundings by feeling, thinking coming later; whilst the other adapts himself by means of thought, preceded by understanding. The one who feels his way transfers himself to some extent to the object; whilst the other withdraws himself from the object to some extent, or pauses before it and reflects about it. The first we called the *extroverted* type, because in the main he goes outside himself to the object, the latter is called the *introverted* type, because in a major degree he turns away from the object, withdrawing into himself and thinking about it.

These remarks only give the broadest outline of the two types. But even this quite inadequate sketch enables us to recognise that the two theories are the outcome of the contrast between the two types. The sexual theory is promulgated from the standpoint of feeling, the power theory from that of thought; for the extrovert always places the accent upon the feelings that are connected with the object, whereas the introvert always puts the accent upon the ego, and is as much detached by thought from the object as possible.

The irreconcilable contradictions of the two theories are now to be understood, because both theories are the product of a one-sided psychology. We find an instance of the contrast of types in Nietzsche and Wagner. The dissension between the two is due to the contrast in their ideas of psychological values. What is most prized by the one is "affectation" for the other, and is deemed false to the very core. Each depreciates the other.

If we apply the sexual theory to an extrovert it tallies with the facts of the case; but if we apply it to an introvert, we simply maltreat and do violence to his psychology. The same applies to the contrary case. The relative

rightness of the two hostile theories is explained by the fact that each one draws its material from cases that prove the correctness of the theory. There is a remnant of persons whom neither theory fits—has not every rule its exceptions?

Criticism of both theories is indispensable. Recognition of facts showed the necessity of overcoming their contrast, and of evolving a theory that should do justice not only to one or the other type, but equally to both.

Even the layman will to some extent have been struck by the fact that in spite of their correctness both theories really have a very unpleasant character and one not altogether pertinent under all circumstances to the strict views of science. The sexual theory is unæsthetic and unsatisfying intellectually. The power theory, on the other hand, is decidedly venomous. Both inevitably reduce high-flown ideals, heroic attitudes, pathos, and deep convictions, in a painful manner to a reality which is hackneyed and trite; that is, if these theories are applied to such things—but they should certainly not be so applied. Both theories are really only therapeutic instruments out of the tool-chest of the physician, whose sharp and merciless knife cuts out all that is pernicious and diseased. It was just such a misapplication of theory Nietzsche tried with his destructive criticism of ideals. He regarded ideals as rampant diseases of the soul of humanity; as indeed they really are. However, in the hands of a good physician who really knows the human soul, who, as Nietzsche says, "has a finger for the slightest shade," who applies the treatment only to what is really diseased in a soul—in such hands both theories prove wholesome caustics. The application must be adapted to the individual case. It is a dangerous therapy in the hands of those who do not understand how to deal out the treatment. These applications of criticism do good when there is something that should and must be destroyed, dissolved or brought low, but can easily damage what is being built up, or growing in response to life's requirements.

Both theories might, therefore, be allowed to pass without attack, in so far as they, like medicinal poisons, are entrusted to the safe hands of the physician. But fate has ordained that they should not remain solely in the care of those who are qualified to use them. First of all they naturally became known to the medical public. Every practising physician has an indefinitely high percentage of neurotics among his patients; he is therefore more or less obliged to look out for new and suitable systems of treatment.

He ultimately lights upon the difficult method of psychoanalysis. He is at first not competent for this, for how should he have learnt about the secrets of the human soul? Certainly not through his academic studies. The smattering of psychiatry that he acquired for his examination barely suffices to enable him to recognise the symptoms of the commonest mental disturbances, and is far from giving him any sufficient insight into the human soul. He is, therefore, practically quite unprepared to apply the analytic method. An unusually far-reaching knowledge of the soul is indeed necessary in order to be able to apply this caustic treatment with advantage. One must be in a position to differentiate elements that are diseased and should be discarded, from those which are valuable and should be retained. This is plainly a matter of great difficulty. Any one who wishes to get a vivid impression of the way in which a psychologising physician may unwarrantably violate a patient through an ignoble pseudo-scientific prejudice, should read what Moebius has written about Nietzsche. Or he may study various psychiatric writings about the "case of Christ," and will surely not hesitate to lament the lot of the patient whose fate it is to meet with such "understanding." Psychoanalysis—greatly to the regret of the medical man who, however, had not accepted it—then passed over into the hands of the teaching profession. This is right: for it is really, when rightly understood and handled, an educational method, and one of the social sciences. I would, however, never personally recommend that Freud's purely sexual analysis should be exclusively applied as an educational method. It might do much harm because of its one-sidedness. In order to make psychoanalysis available for educational purposes, all the metamorphoses that have been the work of the last few years were needed. The method had to be expanded from a general psychological point of view.

But the two theories of which I have spoken are not general theories. They are, as I have said, caustics to be applied, so to say, "locally," for they are both destructive and reductive. They explain to the patient that his symptoms come from here or there, and are "nothing but" this or that. It would be very unjust to wish to maintain that this reductive theory is wrong in a given case, but when exalted into a general explanation of the nature of the soul—whether sick or healthy—*a reductive theory becomes impossible*. For the human soul, whether it be sick or healthy, cannot be *merely* reductively explained. Sexuality it is true is always and everywhere present; the instinct for power certainly does penetrate the heights and the depths of

the soul; but the soul itself is not solely either the one or the other, or even both together, it is also that which it has made and will make out of them both. A person is only half understood when one knows how everything in him came about. Only a dead man can be explained in terms of the past, a living one must be otherwise explained. Life is not made up of yesterdays only, nor is it understood nor explained by reducing to-day to yesterday. Life has also a to-morrow, and to-day is only understood if we are able to add the indications of to-morrow to our knowledge of what was yesterday. This holds good for all expressions of psychological life, even for symptoms of disease. Symptoms of neurosis are not merely consequences of causes that once have been, whether they were "infantile sexuality" or "infantile instinct for power." They are endeavours towards a new synthesis of life. It must immediately be added, however, they are endeavours that have miscarried. None the less they are attempts; they represent the germinal striving which has both meaning and value. They are embryos that failed to achieve life, owing to unpropitious conditions of an internal and external nature.

The reader will now probably propound the question: What possible value and meaning can a neurosis have? Is it not a most useless and repulsive pest of humanity? Can being nervous do anybody good? Possibly, in a way similar to that of flies and other vermin, which were created by God in order that man might exercise the useful virtue of patience. Stupid as this thought is from the standpoint of natural science, it might be quite shrewd from that of psychology; that is, if we substitute "nervous symptoms" in the place of "vermin." Even Nietzsche, who had an uncommon disdain for anything stupid and trite in thought, more than once acknowledged how much he owed to his illness. I have known more than one person who attributed all his usefulness, and the justification for his existence even, to a neurosis, that hindered all decisive stupidities of his life, *compelling* him to lead an existence which developed what was valuable in him; material that would have been crushed had not the neurosis with its iron grip forced the man to keep to the place where he really belonged. There are people the meaning of whose life—whose real significance—lies in the unconscious; in consciousness lies only all that is vain and delusive. With others the reverse is the case, and for them the neurosis has another significance. An extended reduction is appropriate to the one, but emphatically unsuitable to the other.

The reader will now, indeed, be inclined to agree to the possibility of certain cases of neurosis having such a significance but will nevertheless be ready to deny an expediency that is so far-reaching and full of meaning to ordinary cases of this illness. What value, for instance, might there be in the afore-mentioned case of asthma and hysterical attacks of fear? I confess that the value here is not so obvious, especially if the case be looked at from the standpoint of a reductive theory, that is, from that of a *chronique scandaleuse* of the psychological development of an individual.

We perceive that both the theories hitherto discussed have this one point in common, viz. they relentlessly disclose everything that is valueless in people. They are theories, or rather hypotheses, which explain wherein the cause of the sickness lies. They are accordingly concerned not with the *values* of a person, but with his lack of value that makes itself evident in a disturbing way. From this point of view, it is possible to be reconciled to both standpoints.

A "value" is a possibility by means of which energy may attain development. But in so far as a negative value is also a possibility through which energy may attain development—as may, for instance, be clearly seen in the very considerable manifestations of energy shown in neurosis—it also stands for a value, albeit it brings about manifestations of energy which are useless and harmful. In itself energy is neither useful nor harmful, neither full of value nor lacking in it; it is indifferent, everything depending upon the *form* into which it enters. The form gives the quality to the energy. On the other side, mere form without energy is also indifferent. Therefore in order to bring about a positive value, on the one hand energy is necessary, and upon the other a valuable form. In a neurosis psychic energy is undoubtedly present, but in an inferior and not realisable form. Both the analytic methods that have been discussed above are of service only as solvents of this inferior form. They prove themselves good here as caustics.

By these methods we gain energy that is certainly free, but which, being as yet unapplied, is indifferent. Hitherto the supposition prevailed, that this newly acquired energy was at the patient's conscious disposal, that he might apply it in any way he liked. In so far as it was thought that the energy was nothing but the sexual impulse, people spoke of a sublimated application of the same, under the presumption that the patient could, without further ado, transfer what was thought of as sexual energy into a "sublimation"; that is,

into a non-sexual form of use. It might, for instance, be transferred to the cultivation of an art, or to some other good or useful activity. According to this concept, the patient had the possibility of deciding, either arbitrarily or from inclination, how his energy should be sublimated.

This conception may be accorded a justification for its existence, in so far as it is at all possible for a human being to assign a definite direction to his life, in which its course should run. But we know that there is no human forethought nor philosophy which can enable us to give our lives a prescribed direction, except for quite a short distance. Destiny lies before us, perplexing us, and teeming with possibilities, and yet only one of these many possibilities is our own particular right way. Who should presume to designate the one possibility beforehand, even though he have the most complete knowledge of his own character that a man can have? Much can certainly be attained by means of will-power. But having regard to the fate of certain personalities with particularly strong wills, it is entirely misleading for us to want at all costs to change our own fate by power of will. Our will is a function that is directed by our *powers of reflection*; it depends, therefore, upon how our powers of reflection are constituted. In order to deserve its name reflection must be *rational*, that is, according to reason. But has it ever been proved, or can it ever be proved, that life and destiny harmonise with our human reason, that is, that they are exclusively rational? On the contrary, we have ground for supposing that they are also irrational, that is to say, that in the last resort they too are based in regions beyond the human reason. The irrationality of the great process is shown by its so-called *accidentalness*, which perforce we ought to deny, since, obviously, we cannot think of a process not being causally and necessarily conditioned. But actually, accidentality exists everywhere, and does so indeed so obtrusively that we might as well pocket our causal philosophy! The rich store of life both is, and is not, determined by law; it is at the same time rational and irrational. Therefore, the reason and the will founded upon it are only valid for a short distance. The further we extend this rationally chosen direction, the surer we may be that we are thereby excluding the irrational possibilities of life, which have, however, just as good a right to be lived. Aye, we even injure ourselves, since we cut off the wealth of accidental eventualities by a too rigid and conscious direction. It was certainly very expedient for man to be able to give his life a direction; it would, therefore, be quite right to maintain that the attainment of

reasonableness was the greatest achievement of mankind. But that is not to say that under all circumstances, this must or will always continue to be the case. The present fearful catastrophic world-war has tremendously upset the most optimistic upholder of rationalism and culture.

In 1913 Ostwald wrote^[236] as follows: "The whole world agrees that the present state of armed peace is untenable, and is gradually becoming an impossible condition. It demands tremendous sacrifices from individual nations far surpassing the outlay for cultural purposes, without any positive values being gained thereby. Therefore, if mankind could discover ways and means of putting an end to these preparations for a war *that will never come*, this conscripting of a considerable part of the nation at the best and most capable age for training for war purposes, if it could overcome all the innumerable other injuries caused by the present customs, such an enormous saving of energy would be effected, that an undreamt-of development of the evolution of culture might be expected. For like a hand-to-hand fight, war is the oldest, and also the most unsuitable of all possible means of solving a conflict between wills, being indeed accompanied by the most deplorable waste of energy. The complete setting aside of potential as well as of actual warfare is, therefore, absolutely one of the most important tasks of culture in our time, a real necessity from the point of view of energy."

But the irrationality of destiny ordained otherwise than the rationality of the well-meaning thinker; since it not only determined to use the piled-up weapons and soldiers, but much more than that, it brought about a tremendous insane devastation and unparalleled slaughter. From this catastrophe humanity may possibly draw the conclusion, that only one side of fate can be mastered by rational intention.

What can be said of mankind in general applies also to individuals, for mankind as a whole consists of nothing but individuals. And whatever the psychology of mankind is, that is also the psychology of the individual. We are experiencing in the world-war a fearful balancing-up with the rational intentionality of organised culture. What is called "will" in the individual, is termed "imperialism" among nations, for the will is a demonstration of power over fate, that is, exclusion of what is accidental. The organisation of culture is a rational and "expedient" sublimation of free and indifferent

energies, brought about by design and intention. The same is the case in the individual. And just as the hope of a universal international organisation of culture has experienced a cruel right-about through this war, so also must the individual, in the course of his life, often find that so-called "disposable" energies do not suffer themselves to be disposed of.

I was once consulted by a business man of about forty-five, whose case is a good illustration of the foregoing. He was a typical American self-made man, who had worked himself up from the bottom. He had been successful, and had founded a very extensive business. He had also gradually organised the business in such a way that he could now retire from its management. He had indeed resigned two years before I saw him. Until then he had only lived for his business, concentrating all his energy upon it, with that incredible intensity and one-sidedness that is so peculiar to the successful American man of business. He had bought himself a splendid country seat, where he thought he would "live," which he imagined to mean keeping horses, automobiles, playing golf and tennis, attending and giving parties, etc. But he had reckoned without his host. The energy that had become "disposable" did not enter into these tempting prospects, but betook itself capriciously to quite other ways. A couple of weeks after the commencement of his longed-for life of bliss, he began to brood over peculiar vague physical sensations. A few more weeks sufficed to plunge him into an unprecedented state of hypochondria. His nerves broke down completely. He, who was physically an uncommonly strong and exceptionally energetic man, became like a whining child. And that put an end to all his paradise. He fell from one apprehension to another, worrying himself almost to death. He then consulted a celebrated specialist, who immediately perceived quite rightly that there was nothing wrong with the man but lack of employment. The patient saw the sense of this, and betook himself to his former position. But to his great disappointment no interest for his business presented itself. Neither the application of patience nor determination availed to help. His energy would not by any means be forced back into the business. His condition naturally became worse than before. Energy that hitherto had been actively creative was now turned back into himself, with fearfully destructive force. His creative genius rose up, so to speak, in revolt against him, and instead of, as before, producing great organisations in the world, his demon now created equally clever systems of hypochondriac fallacies, by which the man was absolutely crushed. When I

saw him, he was already a hopeless moral ruin. I tried to make clear to him that such a gigantic amount of energy might indeed be withdrawn from business, but the problem remained as to where it should go. The finest horses, the fastest automobiles, and the most amusing parties are in themselves no inducement for energy, although it is certainly quite rational to think that a man who has devoted his whole life to serious work, has a natural right to enjoy himself. This would necessarily be the case if things happened "humanly" in destiny; first would come work, then well-earned leisure. But things happen irrationally and inconveniently enough, energy requires a congenial channel, otherwise it is dammed up and becomes destructive. My arguments met with no response, as was indeed to be expected. Such an advanced case can only be taken care of till death; it cannot be cured.

This case clearly illustrates the fact that it does not lie in our power to transfer a "disposable" energy to whatever rationally chosen object we may like. Exactly the same may be said of those apparently available energies that are made available by the fact that the psychoanalytical caustic has destroyed their unsuitable forms. These energies can be arbitrarily applied, as has already been said, at the very most only for a short time. They resist following the rationally presented possibilities for any length of time. Psychic energy is indeed a fastidious thing, that insists upon having its own conditions fulfilled. There may be ever so much energy existing, but we cannot make it useful, so long as we do not succeed in finding a congenial channel for it.

The whole of my research work for the last years has been concentrated upon this question. The *first stage* of this work was to discover the extent to which the two theories discussed above were tenable. The *second stage* consisted in the recognition of the fact, that these two theories correspond to two opposite psychological types, which I have designated the introversion and the extroversion types. William James^[237] was struck by the existence of these two types among thinkers. He differentiated them as the "tough-minded," and the "tender-minded." Similarly, Ostwald^[238] discovered an analogous difference in the classical and romantic types among great scholars. I am not therefore alone in my ideas about the types, as is testified by mentioning only these two well-known names out of many others. Historical researches have proved to me that not a few of the great

controversies in the history of thought were based upon the contrast between the types. The most significant case of this kind is the contrast between nominalism and realism, which, beginning with the difference between the Platonic and the Megarian schools, descended to scholastic philosophy, where Abelard won the immortal distinction of at least having ventured an attempt to unite the two contradictory standpoints in conceptualism. This conflict has continued down to the present day, where it finds expression in the antagonism of spiritualism and materialism.

Just as in the general history of thought, so too every individual has a share in this contrast of types. Close investigation proves that people of opposite types have an unconscious predilection for marrying each other, that they may mutually complement one another. Each type has one function that is specially well developed, the introvert using his thought as the function of adaptation, thinking beforehand about how he shall act; whilst the extrovert, on the contrary, feels his way into the object by acting. To some extent he acts beforehand. Hence by daily application the one has developed his thought, and the other his feeling. In extreme cases the one limits himself to thinking and observing, and the other to feeling and acting. It is true that the introvert feels also, very deeply indeed, almost too deeply; that is why an English investigator^[239] has gone so far as to describe his as "the emotional type." True, the emotion is there, but it all remains inside, and the more passionate and deeper his feeling is, the quieter is his outward demeanour. As the proverb puts it, "Still waters run deep." Similarly, the extrovert *thinks* also, but that likewise mostly inside, whilst his feelings visibly go outside, that is why he is held to be full of feeling whilst the introvert is considered cold and dry. But as the feeling of the thinker goes inwards, it is not developed as a function adapted to external situations, but remains in a relatively undeveloped state. Similarly the thinking of one who feels remains also relatively undeveloped.

But if comparatively well-adapted individuals are under consideration, then the introvert will normally be found to have his feeling directed outwards, and the result may be extraordinarily deceptive. He shows feelings; he is amiable, sympathetic, even emotional. But a critical examination of the expressions of his feelings reveals that they are markedly conventional. They are not individualised. He shows to every one, without any essential difference, the same friendliness and the same sympathy; whilst the

extrovert's expressions of feeling are throughout delicately graded and individualised. With the introvert the expression of feelings is really a gesture that is artificially adopted and conventional. Similarly, the extrovert may apparently think, and that even very clearly and scientifically. But upon closer investigation, his thoughts are found to be really foreign property, merely conventional forms which have been artificially acquired. They lack anything individual and original, and are just as lukewarm and colourless as the conventional feelings of the introvert. Under these conventional disguises, quite other things are slumbering in both, which occasionally when awakened by some overpowering effect, suddenly break out to the astonishment and horror of the environment.

Most civilised people incline more to one type than the other. Taken together they would supplement each other exceedingly well. That is why they are so apt to marry one another, and so long as they are fully occupied with adapting themselves to the necessities of life they suit one another splendidly. But if the man has earned a competence, or if a big legacy drop from the sky, terminating the external urgencies of life, then they have time to occupy themselves with each other. Until now they stood back to back, defending themselves against want. But now they turn to each other expecting to understand one another; and they make the discovery that they have never understood one another. They speak different languages. Thus the conflict between the two types of psychology begins. This conflict is venomous, violent and full of mutual depreciation, even if it be conducted very quietly in the utmost intimacy. *This is so because the value of the one is the worthlessness of the other.* The one, starting from the standpoint of his valuable thinking, takes for granted that the feelings of the other correspond to his own inferior feelings, this because he knows absolutely nothing of any other feelings. But the other, starting from the standpoint of his valuable feelings, assumes that his partner has the same inferior thought that he himself has. Evidently there is plenty of work here for Goethe's Homunculus, who had to find out "why husband and wife get on so badly." Now as many cases of neurosis have a basis in such differences, I, as a physician, found myself obliged to relieve the Homunculus of some of his ungrateful task. I am glad to be able to say that many a sufferer has been helped in grave difficulties by the enlightenment I could give.

The *third stage* of the path of increasing understanding consisted in formulating a theory of the psychology of types which would be of practical use for the development of man. Viewed from the newly-gained standpoint, there resulted, first of all, *a totally new theory of psychogenic disturbances*.

The foundation of the facts remains the same: the first hypothesis of every neurosis is the existence of an unconscious conflict. According to Freud's theory, this is an erotic conflict, or to speak more exactly, a battle of the moral consciousness against the unconscious infantile sexual world of phantasy and its transference to external objects. According to Adler's theory, it is a battle of the superiority of the ego against all oppressive influences, whether from inside or outside.

But the new idea asserts that *the neurotic conflict always takes place between the adapted function and the co-function that is undifferentiated, and that lies to a great extent in the unconscious*; therefore in the case of the introvert, between thought and unconscious feeling, but in that of the extrovert, between feeling and unconscious thought.^[240] Another theory of the etiological moment results from this. If a man who naturally adapts himself by thinking is faced by a demand that cannot be met by thinking alone, but which requires differentiated feeling, the traumatic or pathogenic conflict breaks out. On the contrary, the critical moment comes to the man who adapts by feeling when he is faced by a problem requiring differentiated thought. The afore-mentioned case of the business man is a clear example of this. The man was an introvert, who all through his life had left every consideration of sentiment in the background, that is, in the unconscious. But when, for the first time in his life, he found himself in a situation in which nothing could be done except by means of differentiated feeling, he failed utterly. At the same time, a very instructive phenomenon occurred; his unconscious feelings manifested themselves as *physical sensations* of a vague nature. This fact harmonises with a generally accepted experience in our psychology, to wit, that undeveloped feelings partake of the character of vague physical sensations, since undifferentiated feelings are as yet identical with subjective physical sensations. Differentiated feelings are of a more "abstract" objective nature. This phenomenon may well be the unconscious basis of the earliest statement of psychological types that is known to me; namely, the three types of the Valentinian School. They held the undifferentiated type to be the so-called

hyletic (material) man. He was ranked below the differentiated types, that is, the psychic (soulful) man, who corresponds to the extroversion type; and the pneumatic (spiritual) man, who corresponds to the introversion type. For these gnostics the "pneumatikos" stood of course the highest. Christianity, with its "psychic" (spiritual) nature (principle of love), has indeed contested this privilege of the gnosis. But even this page may be turned in the course of time: since, if the signs of the age are not deceptive, we are now in the great final settlement of the Christian epoch. We know that, evolution not being uniformly continuous, when one form of creation has been outlived, the evolutionary tendency harks back to resume that form which, after having made a beginning, was left behind in an undeveloped state.

After this brief digression to generalities, let us return to our case. If a similar disturbance were to take place in an extrovert, he would have what are called hysterical symptoms, that is, symptoms that are also of an apparently physical nature, which, as our theory indicates, would this time represent the patient's unconscious undifferentiated thought. As a matter of fact, we find also a widespread region of phantasy as the basis of hysterical symptoms, of which many have been described in detail in the literature of the subject. They are phantasies of a pronounced sexual, that is physical complexion. But in reality they are undifferentiated thoughts, which in common with the undifferentiated feelings are to some extent physical, and therefore appear as what may be called physical symptoms.

By taking up again here the thread that was dropped before, we can now clearly see why it is precisely in the neurosis that those values which are most lacking to the individual lie hidden. We might also now return to the case of the young woman, and apply to it the newly-won insight. She is an extrovert with an hysterical neurosis. Let us suppose that this patient had been "analysed," that is, that the treatment having made it clear to her what kind of unconscious thoughts lay behind her symptoms, she had regained possession of the psychic energy which by becoming unconscious had constituted the strength of the symptoms. The following practical question now arises: what can be done with the so-called available energy? It would be rational, and in accordance with the psychological type of the invalid, to extrovert this energy again, that is to transfer it to an object, as for instance to philanthropic or some other useful activities. This way is possible only in

exceptional cases—there are energetic natures who do not shrink from care and trouble in a useful cause, there are people who care immensely about just such occupations—otherwise it is not feasible. For it must not be forgotten, that in the case under consideration, the libido (that is the technical expression for the psychic energy) has found its object already unconsciously in the young Italian, or an appropriate real human substitute. Under these circumstances such a desirable sublimation, however natural, is out of the question. For the object of the energy usually affords a better channel than an ethical activity, however attractive. Unfortunately there are many people who always speak of a person, not as he is, but as he would be if their desires for him were realised. But the physician is necessarily concerned with the actual personality, which will obdurately remain the same, until its real character has been recognised on all sides. An analysis must necessarily be based upon the recognition of naked reality, not upon any arbitrarily selected phantasies about a person, however desirable.

The fact is that the so-called available energy unfortunately cannot be arbitrarily directed as desired. It follows its own channel, one which it had already found, even before we had quite released it from its bondage to the unadapted form. For we now make the discovery that the phantasies which were formerly occupied with the young Italian, have been transferred to the physician himself. The physician has therefore himself become the object of the unconscious libido. If this is not the case, or if the patient will on no account acknowledge the fact of transference, or again, if the physician either does not understand the phenomenon at all, or does so wrongly, then violent resistances make their appearance, which aim at completely breaking off relations with the doctor. At this point patients leave and look for another doctor or for people who "understand" them; or if they hopelessly relinquish this search they go to pieces.

But if the transference to the physician takes place and is accepted, a natural channel has thereby been found, which not only replaces the former, but also makes a discharge of the energetic process possible, and provides a course that is relatively free from conflict. Therefore if the libido is allowed its natural course, it will of its own accord find its way into the transference. Where this is not the case, it is always a question either of arbitrary rebellion against the laws of Nature, or of some deficiency in the physician's work.

Into the transference every conceivable infantile phantasy is first of all projected; these must then be subjected to the caustic, that is, analytically dissolved. This was formerly called the *dissolution of the transference*. Thereby the energy is freed from this unsuitable form also, and once again we are confronted by the problem of disposable energy. We shall find that an object affording the most favourable channel has been chosen by Nature even before our search began.

V.—THE PERSONAL AND THE IMPERSONAL UNCONSCIOUS

The fourth stage of our newly won insight is now reached. The analytical dissolution of the infantile transference phantasies was continued until it became sufficiently clear, even to the patient, that he was making his physician into father, mother, uncle, guardian, teacher, friend or any other kind of surrogate for parental authority conceivable. But, as experience is constantly proving, further phantasies make their appearance, representing the physician as saviour or as some other divine being. Obviously this is in flagrant contradiction to the sane reasoning of consciousness. Moreover, it appears that these divine attributes considerably overstep the bounds of the Christian conception in which we grew up. They even assume the guise of heathen allurements, and, for instance, not infrequently assume the form of animals.

The transference is in itself nothing but a projection of unconscious contents on to the analyst. At first it is the so-called superficial contents that are projected. During this stage the physician is interesting as a possible lover (somewhat after the manner of the young Italian in our case). Later on, he is a representation of the father, and is the symbol either of kindness or of severity, according to what the patient formerly imputed to his real father. Occasionally the doctor even appears to the patient as a kind of mother, which, though sounding somewhat strange, really lies well within the bounds of possibility. All these projections of phantasy have an underlying basis of personal reminiscences.

But presently other forms of phantasy appear, bearing an extravagantly effusive and impossible character. The physician now appears to be endowed with uncanny qualities; he may be either a wizard or a demoniacal criminal, or his counterpart of virtue, a saviour. Later on he appears as an

incomprehensible mixture of both sides. It should be clearly understood that the physician does not appear to the patient's consciousness in these forms, but that phantasies come up to the surface representing the doctor in this guise. If, as is not seldom the case, the patient cannot forthwith perceive that his view of the physician is a projection of his own unconscious, then he will probably behave rather foolishly. Difficulties often arise at this stage of analysis, making severe demands upon the good will and patience of both physician and patient. In a few exceptional cases, a patient cannot refrain from disseminating the stupidest tales about the physician. Such people cannot get it into their head that, as a matter of fact, their phantasies originate in themselves, and have nothing or very little to do with the physician's actual character. The pertinacity of this error arises from the circumstance that there is no foundation of personal memory for this particular kind of projection. It is occasionally possible to prove that similar phantasies, for which neither parent gave reasonable occasion, had at some time in childhood been attached to the father or mother.

In one of his shorter books, Freud has shown how Leonardo da Vinci was influenced in his later life by the fact that he had two mothers. The fact of the two mothers (or the double descent) had indeed a reality in Leonardo's case, but it plays a part with other artists as well. Benvenuto Cellini had this phantasy of a double descent. It is unquestionably a mythological theme; many heroes of legend have two mothers. The phantasy is not founded upon the actual fact of the hero's having two mothers, but is a widespread "primordial image" belonging to the secrets of the universal history of the human mind. It does not belong to the sphere of personal reminiscences.

In every individual, in addition to the personal memories, there are also, in Jacob Burckhardt's excellent phrase, the great "primordial images," the inherited potentialities of human imagination. They have always been potentially latent in the structure of the brain. The fact of this inheritance also explains the otherwise incredible phenomenon, that the matter and themes of certain legends are met with all the world over in identical forms. Further, it explains how it is that persons who are mentally deranged are able to produce precisely the same images and associations that are known to us from the study of old manuscripts. I gave some examples of this in my book on "The Psychology of the Unconscious." I do not hereby assert the

transmission of representations, but only of the *possibility of such representations*, which is a very different thing.

It is therefore in this further stage of the transference that those phantasies are produced that have no basis in personal reminiscence. Here it is a matter of the manifestation of the deeper layers of the unconscious, where the primordial universally-human images are lying dormant.

This discovery leads to the fourth stage of the new conception: that is, to the recognition of a *differentiation in the unconscious itself*. We are now obliged to differentiate a personal unconscious and an impersonal or super-personal unconscious. We also term the latter the *absolute or collective unconscious*, because it is quite detached from what is personal, and because it is also absolutely universal, wherefore its contents may be found in every head, which of course is not the case with the personal contents.

The primordial images are quite the most ancient, universal, and deep thoughts of mankind. They are feeling just as much as thought, and might therefore be termed *original thought-feelings*.

We have therewith now found the object selected by the libido when it was freed from the personal-infantile form of transference. Namely, that it sinks down into the depths of the unconscious, reviving what has been dormant there from immemorial ages. It has discovered the buried treasure out of which mankind from time to time has drawn, raising thence its gods and demons, and all those finest and most tremendous thoughts without which man would cease to be man.

Let us take as an example one of the greatest thoughts to which the nineteenth century gave birth—the idea of the *conservation of energy*. *Robert Mayer* is the originator of this idea. He was a physician, not a physicist nor a natural philosopher, to either of whom the creation of such an idea would have been more germane. It is of great importance to realise that in the real sense of the word, Robert Mayer's idea was not *created*. Neither was it brought about through the fusion of the then-existent conceptions and scientific hypotheses. It grew in the originator, and was conditioned by him. Robert Mayer wrote (1841) to Griesinger as follows: "I by no means concocted the theory at the writing-desk." He goes on to report about certain physiological investigations that he made in 1840-41 as doctor

on board ship, and continues: "If one wishes to be enlightened about physiological matters, some knowledge of physical processes is indispensable, unless one prefers to work from the metaphysical side, which is immensely distasteful to me. I therefore kept to physics, clinging to the subject with such ardour that, although it may well seem ridiculous to say so, I cared little about what part of the world we were in. I preferred to remain aboard where I could work uninterruptedly, and where many an hour gave me such a feeling of *being inspired* in a way I can never remember having experienced either before or since.

"A few flashes of thought that thrilled through me"—this was in the harbour of Surabaja—"were immediately diligently pursued, leading again in their turn to new subjects. Those times are passed, but subsequent quiet examination of *what then emerged*, has taught me that it was a truth which can *not only be subjectively felt*, but also proved objectively; whether this could be done by *one who has so little knowledge* of physics as I have, is a matter which obviously, I must leave undecided."

Heim, in his book on Energetics, expresses the opinion: "that Robert Mayer's new thought did not gradually detach itself by dint of revolving it in his mind, from the conceptions of power transmitted from the past, *but belongs to those ideas that are intuitively conceived, which, originating in other spheres of a mental kind, surprise thought, as it were, compelling it to transform its inherited notions conformably with those ideas.*"

The question now arises, whence did this new idea that forced itself upon consciousness with such elemental power spring? And whence did it derive such strength that it was able to effect consciousness so forcibly that it could be completely withdrawn from all the manifold impressions of a first voyage in the tropics? These questions are not easy to answer. If we apply our theory to this case the explanation would run as follows: *The idea of energy and of its conservation must be a primordial image that lay dormant in the absolute unconscious.* This conclusion obviously compels us to prove that a similar primordial image did really exist in the history of the human mind, and continued to be effective through thousands of years. As a matter of fact, evidence of this can be produced without difficulty. *Primitive religions, in the most dissimilar regions of the earth, are founded upon this image.* These are the so-called *dynamistic religions*, whose sole and distinctive thought is the existence of some universal magical power upon

which everything depends. The well-known English scholars, Taylor and Frazer, both wrongly interpreted this idea as animism. Primitive peoples do not mean souls or spirits by their conception of power, but in reality something that the American investigator *Lovejoy*^[241] most aptly terms "primitive energetics."

In an investigation appertaining to this subject, I showed that this notion comprises the idea of soul, spirit, God, health, physical strength, fertility, magic power, influence, might, prestige, curative remedies, as well as certain states of mind which are characterised by the setting loose of affects. Among certain Polynesians "Melungu" (that is this primitive concept of energy) is spirit, soul, demoniacal being, magic, prestige. If anything astonishing happens, the people cry "Melungu." This notion of power is also the first rendering of the concept of God among primitive peoples. The image has undergone many variations in the course of history. In the Old Testament this magic power is seen in the burning bush, and shines in the face of Moses. It is manifest in the Gospels as the outpouring of the Holy Spirit, as cloven tongues of fire from heaven. In Heraclitus it appears as universal energy, as "eternally living fire"; for the Persians it is the fiery brightness, haôma, divine mercy; for the Stoics it is heimarmene, the power of destiny. In mediæval legend it is seen as the aura, or the halo of the saint. It blazes forth in great flames from the hut where the saint is lying in ecstasy. The saints reflect the sum of this power, the storehouse of light, in their faces. According to ancient concepts this power is the soul itself; the idea of its immortality contains that of its *conservation*. The Buddhistic and primitive conception of the metempsychosis (transmigration of souls) contains the idea of its *unlimited capacity for transformation under constant conservation*.

This thought has obviously therefore been imprinted on the human brain for untold ages. That is why it lies ready in the unconscious of every one. Only certain conditions are needed in order to let it appear again. These conditions were obviously fulfilled in the example of Robert Mayer. The greatest and best thoughts form themselves upon these primordial images, which are the ancient common property of humanity.

After this instance of the nascence of new ideas out of the treasury of primordial images, we will resume the further delineation of the process of

transference. It was seen that the libido of the patient seizes upon its new object in those apparently preposterous and peculiar phantasies, namely the contents of the absolute unconscious. As I already observed, the unacknowledged projection of primordial images upon the physician constitutes a danger for further treatment which should not be undervalued. The images contain not only every beautiful and great thought and feeling of humanity, but also every deed of shame and devilry of which human beings have ever been capable. Now, if the patient cannot differentiate the physician's personality from these projections, there is an end to mutual understanding, and human relations become impossible. If however the patient avoids this Charybdis, he falls into the Scylla of *introjecting* these images, that is, he does not ascribe their qualities to the physician but to himself. This peril is just as great. If he projects, he vacillates between an extravagant and morbid deification, and a spiteful contempt of his physician. In the case of introjection, he falls into a ludicrous self-deification or moral self-laceration. The mistake that he makes in both cases consists in attributing the contents of the absolute unconscious to himself personally. Thus he makes himself into both God and devil. This is the psychological reason why human beings have always needed demons, and could not live without gods. There is the exception, of course, of a few specially clever specimens of the *homo occidentalis* of yesterday and the day before—supermen whose God is dead, wherefore they themselves become gods. There is also the example of Nietzsche, who confessedly required chloral in order to be able to exist. These supermen even become rationalistic petty gods, with thick skulls and cold hearts. The concept of God is simply a necessary psychological function of an irrational nature that has altogether no connection with the question of God's existence. This latter question is one of the most fatuous that can be put. It is indeed sufficiently evident that man cannot conceive a God, much less realise that he actually exists, so little is he able to imagine a process that is not causally conditioned. Theoretically, of course, no accidentality can exist, that is certain, once and for all. On the other hand, in practical life, we are continually stumbling upon accidental happenings. It is similar with the existence of God; it is once and for all an absurd problem. But the *consensus gentium* has spoken of gods for æons past, and will be speaking of them in æons to come. Beautiful and perfect as man may think his reason, he may nevertheless assure himself that it is only one of the possible

mental functions, coinciding merely with the corresponding side of the phenomena of the universe. All around is the irrational, that which is not congruous with reason. And this irrationalism is likewise a psychological function, namely the absolute unconscious; whilst the function of consciousness is essentially rational. Consciousness must have rational relations, first of all in order to discover some order in the chaos of disordered individual phenomena in the universe; and secondly, in order to labour at whatever lies within the area of human possibility. We are laudably and usefully endeavouring to exterminate so far as is practicable the chaos of what is irrational, both in and around us. Apparently we are making considerable progress with this process. A mental patient once said to me, "Last night, doctor, I disinfected the whole heavens with sublimate, and yet did not discover any God." Something of the kind has happened to us. Heraclitus, the ancient, that really very wise man, discovered the most wonderful of all psychological laws, namely, the *regulating function of antithesis*. He termed this "enantiodromia" (clashing together), by which he meant that at some time everything meets with its opposite. (Here I beg to remind the reader of the case of the American business man, which shows the enantiodromia most distinctly.) The rational attitude of civilisation necessarily terminates in its antithesis, namely in the irrational devastation of civilisation. Man may not *identify* himself with reason, for he is not wholly a rational being, and never can or ever will become one. That is a fact of which every pedant of civilisation should take note. What is irrational cannot and may not be stamped out. The gods cannot and may not die. Woe betide those men who have disinfected heaven with rationalism; God-Almightiness has entered into them, because they would not admit God as an absolute function. They are identified with their unconscious, and are therefore its sport. (For where God is nearest, there the danger is greatest.) Is the present war supposed to be a war of economics? That is a neutral American "business-like" standpoint, that does not take the blood, tears, unprecedented deeds of infamy and great distress into account, and which completely ignores the fact that this war is really an *epidemic of madness*. The several parties project their unconscious upon each other, hence the mad confusion of ideas in every head. This is the enantiodromia that occurs in the individual life of man, as well as in that of peoples. The legend of the Tower of Babel turns out to be a tenable truth.

Only he escapes from the cruel law of enantiodromia who knows how to separate himself from the unconscious—not by repressing it, for then it seizes him from behind—but *by presenting it visibly to himself as something that is totally different from him.*

This gives the solution of the Scylla and Charybdis problem which I described above. The patient must learn to differentiate in his thoughts between what is the ego and what is the non-ego. The latter is the collective psyche or absolute unconscious. By this means he will acquire the material with which henceforward, for a long time, he will have to come to terms. Thereby the energy, that before was invested in unsuitable pathological forms, will have found its appropriate sphere. In order to differentiate the psychological ego from the psychological non-ego, man must necessarily stand *upon firm feet* in his ego-function; that is, *he must fulfil his duty towards life completely, so that he may in every respect be a vitally living member of human society.* Anything that he neglects in this respect descends into the unconscious and reinforces its position, so that he is in danger of being swallowed up by it, if his ego-function is not established. Severe penalties are attached to that. As indicated by old Synesius, the "spiritualised soul (pneumatike psyché) becomes god and demon, a state in which it suffers the divine penalties," that is, it suffers being torn asunder by the Zagreus, an experience which Nietzsche also underwent at the beginning of his insanity, where, in "Ecce Homo," the God whom he was despairingly resisting in front assailed him from behind. Enantiodromia is the being torn asunder into the pairs of opposites, which opposites are only proper to "the god," and therefore also to the deified man, who owes likeness to God to his having prevailed over his gods.

VI.—THE SYNTHETIC OR CONSTRUCTIVE METHOD

We now reach the fifth stage of progressive understanding. The coming to terms with the unconscious is a technical performance to which the name of *transcendental function* has been given because a new function is produced, which being based upon both real and imaginary, or rational and irrational data, makes a bridge between the rational and irrational functions of the psyche. The basis of the transcendental function is a *new method of treating psychological materials* such as dreams and phantasies. The theories previously discussed were based upon an exclusively causal-reductive procedure, which reduces the dream or phantasy to its component

reminiscences, and the instinctive processes that underlie them. I have already stated the justification as well as the limitations of this proceeding. It reaches the end of its usefulness at the moment when the dream symbols no longer permit of a reduction to personal reminiscences or aspirations; that is when the images of the absolute unconscious begin to be produced. It would be quite inappropriate to reduce these collective ideas to what is personal, and not only inappropriate but even actually pernicious, a fact that has been impressed upon me by disagreeable experiences. The values of the images or symbols of the absolute unconscious are only disclosed if they are subjected to a synthetic (not analytical) treatment. Just as analysis (the causally reductive procedure) disintegrates the symbol into its components, so the synthetic procedure synthesises the symbol into a universal and comprehensible expression. The synthetic procedure is by no means easy; I will therefore give an example, by means of which I can explain the whole process.

A patient had the following dream. She was just at the critical juncture between the analysis of the personal unconscious and the commencement of the production of the absolute unconscious. "*I am on the point of crossing a broad and rapid stream. There is no bridge, but I find a ford where I can cross. As I am just on the point of doing so, a big crab that lay hidden in the water seizes my foot and does not let it go.*" She awoke in fear. Associations with the dream were as follows:—

1. *Stream*.—It forms a boundary that is difficult to cross. I must surmount an obstacle; I suppose it refers to the fact that I am getting on very slowly; I suppose I ought to reach the other side.
2. *Ford*.—An opportunity for getting safely across, a possible way; otherwise the stream would be too difficult. The possibility of surmounting the obstacle lies in the analytical treatment.
3. *Crab*.—The crab lay quite hidden in the water; I did not see it at first. Cancer is a fearful incurable illness. (A series of recollections of Mrs. X., who died of cancer, followed.) I am afraid of this illness. A crab^[242] is an animal that walks backwards; obviously it wants to pull me down into the stream. It clutched me in a gruesome way, and I was awfully afraid. What prevents my getting across? Oh yes, I had another great scene with my friend.

It must be explained that there is something special about this friendship. We have here an ardent attachment, bordering on the homosexual. It has been going on for years. The friend is in many respects like the patient, and is also nervous. They have pronounced artistic interests in common. But the patient is the stronger personality of the two. They are both nervous, and their mutual relation being too engrossing, cuts them off too much from other possibilities of life. In spite of an "ideal friendship" they have at times tremendous scenes, owing to their mutual irritability. Evidently the unconscious wishes to put some distance between them, but they refuse to pay attention to it. A "scene" usually begins by one of them finding that she does not yet understand the other well enough, and that they ought to talk more openly together; whereupon both make enthusiastic endeavours to talk things out. Misunderstandings supervene almost directly, provoking fresh scenes, each worse than the last. The quarrel was in its way and *faute de mieux* a pleasure to both of them, which they were unwilling to relinquish. My patient, especially, was unable for a very long time to renounce the sweet pain of not being understood by her best friend, although, as she said, every scene "tired her to death." She had long since realised that this friendship had become superfluous, and that it was only from mistaken ambition that she clung to the belief that she could yet make something ideal out of it. The patient had formerly had an extravagant, fantastic relation to her mother, and after her mother's death had transferred her feelings to her friend.

VII.—ANALYTICAL (CAUSAL-REDUCTIVE) INTERPRETATION. [243]

This interpretation may be summed up in a sentence: "I understand that I ought to get to the other side of the stream (that is, give up the relation with the friend), but I would much rather that my friend did not let me out of her claws (embrace)." That is, expressed as an *infantile wish*: Mother would like to attract me to herself again by the well-known mode of enthusiastic embraces. The incompatibility of the wish lies in the strong under-current of *homosexuality*, the existence of which had been abundantly proved by obvious facts. The crab seizes her foot. The patient having big, "manly" feet, she plays a masculine part towards her friend, having also corresponding sexual fantasies. The foot is known to have phallic significance. (Detailed evidence of this is to be found in *Aigremont's*

writings.) The complete interpretation would run as follows: The reason why she will not let her friend go is because her unconscious homosexual wishes are set upon her. As these wishes are morally and aesthetically incompatible with the tendency of the conscious personality, they are repressed, and therefore unconscious. The fear is an expression of this repressed wish.

This interpretation is exceedingly depreciative of the patient's high-pitched conscious ideal of friendship. It is true at this point in analysis she would no longer have taken this interpretation amiss. Some time before certain facts had sufficiently convinced her of her homosexual tendency, so that she was able to acknowledge the existence of this inclination frankly, although it was of course painful for her to do so. Therefore if, at this stage of the treatment, I had informed her that this was the interpretation, I should not have encountered resistances from her. She had already overcome the painfulness of this unwelcome tendency by understanding it. But she would have said to me: "Why do we analyse this dream at all? It is only repeating what I have now known for a long while." It is true this interpretation does not reveal anything new to the patient, and it is therefore uninteresting and ineffective. This kind of interpretation would at the beginning of the treatment have been impossible in this case, because the patient's prudishness would under no circumstances have acknowledged it. The "venom" of understanding had to be instilled very carefully, and in the smallest of doses, until the patient gradually became more enlightened. But when the analytical or causal-reductive interpretation, instead of furnishing something new, persistently brings the same material in different variations, then the moment has come when another mode of interpretation is called for. The causal-reductive procedure has certain drawbacks. First, it does not take strictly into account the patient's associations—*e.g.* in this case the association of the illness ("cancer") with "crab" (Krebs = cancer). Second, the particular choice of symbol remains obscure. For instance, why does the friend-mother appear as a crab? A prettier and more plastic representation would have been a nymph. ("Half dragged she him, half sank he down,"^[244] etc.) An octopus, a dragon, a serpent, or a fish could have performed the same services. Third, the causal-reductive procedure completely ignores that a dream is a subjective phenomenon, and that consequently even an exhaustive interpretation can never connect the crab with the mother or the

friend, but only with the dreamer's idea of them. The whole dream is the dreamer; she is the stream, the crossing, and the crab. That is to say these details are expressions of psychological conditions and tendencies in the subject's unconscious.

I have therefore introduced the following terminology. I call interpretations in which the dream symbols are treated as representations of the real objects *interpretation upon the objective plane*. The opposite interpretation is that which connects every fragment of the dream (e.g. all the persons who do anything) with the dreamer himself. This is *interpretation upon the subjective plane*. Objective interpretation is *analytical*, because it dissects the dream contents into complexes of reminiscence, and finds their relation to real conditions. Subjective interpretation is *synthetic*, because it detaches the fundamental underlying complexes of reminiscence from their actual causes, regarding them as tendencies or parts of the subject, and reintegrating them with the subject. (In experiencing something I do not merely experience the object, but in the first place myself, although this is only the case if I render myself account of the experience.)

The synthetic or constructive procedure of interpretation^[245] is therefore based upon the version on the subjective plane.

VIII.—THE SYNTHETIC (CONSTRUCTIVE) INTERPRETATION.

The patient is unconscious of the fact that it is in herself that the obstacle lies which should be overcome, the boundary that is difficult to cross which impedes further progress. But it is possible to cross the boundary. It is true that just here a peculiar and unexpected peril threatens, namely, something "animal" (non-human or super-human) which moves backwards and goes into the depths of the stream, wanting to draw down the dreamer as a whole personality. This danger is, moreover, like the deadly disease of cancer, which begins secretly somewhere, and is incurable (overpowering). The patient imagines that her friend hinders her, pulling her down. So long as this is her belief she must perforce influence her friend, "draw her up," teach, improve, educate her, and make futile and impractically idealistic efforts in order to avoid being dragged down herself. Of course, the friend makes similar endeavours, being in a like case with the patient. So both of them keep jumping upon each other like fighting cocks, each trying to fly over the other's head. The higher the point to which the one screws herself, the higher must the other also try to get. Why? Because each thinks the fault lies in the other, in the object. Interpretation of the dream on the subjective plane brings deliverance from this absurdity, for it shows the patient that

she has something in herself that is hindering her from crossing the boundary; that is, from getting out of the one position or attitude into another. To interpret change of place as change of attitude is supported by the mode of expression in certain primitive languages, where, *e.g.*, the phrase "I am on the point of going," is "I am at the place of going." In order to understand the language of dreams, we need plenty of parallels from the psychology of primitive peoples, as well as from historical symbolism. This is so because dreams originate in the unconscious, which contains the residual potentialities of function of all preceding epochs of the history of the evolution of man.

Obviously, in our interpretation everything now depends upon understanding what is meant by the crab. We know that it symbolizes something that comes to light in the friend (she connects the crab with the friend), and also something that came to light in the mother. Whether both mother and friend really have this quality in them is irrelevant as regards the patient. The situation will only be changed when the patient herself has changed. Nothing can be changed in the mother because she is dead. The friend cannot be urged to alter; if she wants to alter herself, that is her own affair. The fact that the quality in question is associated with the mother indicates that it is something infantile. What is there in common in the patient's relation both to her mother and her friend? What is common to both is a violently extravagant demand for love, the patient feeling herself overwhelmed by its passion. This claim is an overpowering infantile craving which is characteristically blind. What is in question here is a part of her libido that has not been educated, differentiated, nor humanized, retaining still the compulsive character of an instinct, because it has not yet been tamed by domestication. An *animal* is a perfectly appropriate symbol for this rôle of libido. But why is the animal a crab in this particular instance? The patient associates cancer with it, of which disease Mrs. X. died at the age the patient has just reached. It may, therefore, well be that this is an allusion to an identification with Mrs. X. We must therefore make inquiries about this Mrs. X. The patient relates the following facts about her: Mrs. X. was widowed early; she was very cheerful and enjoyed life. She had a number of adventures with men, especially with one particular man, a gifted artist, who the patient herself knew personally and who always impressed her as very fascinating and weird.

An identification can only result from an unrecognized unconscious resemblance. Now what is the resemblance between our patient and Mrs. X.? I was able here to remind the patient of a series of former fantasies and dreams, which had shown plainly that she also had a frivolous vein in her, although anxiously repressing it, because she vaguely feared it might seduce her to an immoral life. We have now gained a further essential contribution for a right understanding of the "animal" rôle, which evidently represents an untamed, instinctive greed, which in this case is directed to men. At the same time we understand a further reason why she cannot let go of her friend. She must cling to her in order not to fall a prey to this other tendency, which seems so much more dangerous. By these means she remains at an infantile homosexual stage, which serves her as a defence. (Experience proves this erection of defences to be one of the most effective motives for the retention of unadapted, infantile relations.) But in this missing libido in the animal rôle lies her well-being, the germ of her future healthy personality, which does not shrink from the hazards of human life.

But the patient had drawn another conclusion from the fate of Mrs. X., having conceived her severe illness and early death as a punishment of fate for her gay life which the patient, although certainly not confessing to this feeling, always envied her. When Mrs. X. died, the patient pulled a long face, beneath which a "human, all too human," malicious satisfaction was hidden. As a punishment for this tendency the patient, taking Mrs. X.'s example as a warning, deterred herself from living and from further development, and burdened herself with the misery of this unsatisfying friendship. Of course this concatenation had not been consciously clear to her, otherwise she would never have acted as she had done. The truth of this conclusion can be proved by the material.

The history of this identification by no means ends here. The patient subsequently emphasized the fact that Mrs. X. had a not inconsiderable artistic capacity which developed only after her husband's death and which led to her friendship with the artist. This fact seems to be one of the essential incentives to the identification, if we call to mind that the patient had already told us what a striking impression she had received from the artist. A fascination of this kind is never exclusively exercised by one person only upon the other. It is a phenomenon of reciprocal relation between two persons in so far as the fascinated person must provide a

suitable predisposition. But she must be unconscious of this predisposition, otherwise there will be no fascination. Fascination is a phenomenon of compulsion which lacks conscious ground; that is, it is not a process of the will, but a phenomenon coming to the surface from the unconscious, and forcing itself compulsorily upon consciousness. All compulsions arise from unconscious motives. It must therefore be assumed that the patient possesses a similar unconscious predisposition to that of the artist. She becomes identified with this artist, and is also identified with him *as man*. Here we are at once reminded of the analysis of the dream, where we met an allusion to the "masculine" foot. As a matter of fact, the patient plays a thoroughly masculine part towards her friend, being the active one who continually takes the lead, commanding her friend and occasionally even forcing her somewhat violently to some course that only the patient desires. Her friend is distinctly feminine both in her external appearance and otherwise, whilst the patient is also externally of a somewhat masculine type. Her voice is stronger and deeper than that of her friend. She now describes Mrs. X. as a very feminine woman, her gentleness and amiability being comparable to that of her friend, so she thinks. This gives us a new clue. The patient is obviously playing towards her friend the artist's part towards Mrs. X. Thus she unconsciously completes her identification with Mrs. X. and her lover. In this way she is giving expression to her frivolous vein which she had repressed so carefully. She is not living it consciously, however, but is herself played upon by her own unconscious tendency.

We now know a great deal about the crab: it represents the inner psychology of this untamed part of the libido. The unconscious identifications always keep drawing her on. They have this power because being unconscious they cannot be subjected to insight and correction. The crab is the symbol of the unconscious contents. These contents are always seducing the patient to retain her relation to the friend. (The "crab goes backwards.") But the relation to the friend is synonymous with illness, she became nervous through it (hence the association of illness).

Strictly speaking, this really belongs to the analysis on the objective plane. But we must not forget that we only arrive at understanding by applying the *subjective* interpretation, which thereby proves itself to be an important heuristic principle. For practical purposes we might rest quite satisfied with the result we have already reached. But we seek here to satisfy all the

requirements of the theory. Not all the associations have yet been used; neither is the significance of the choice of symbols yet demonstrated sufficiently.

We will now recur to the patient's remark that the crab lay hidden under the water in the stream, and that she had not seen it at first. She had not at first perceived the unconscious relations that have just been elucidated; they lay hidden in the water. But the stream is the obstacle preventing her from going across. It is precisely the unconscious relations binding her to her friend that have been hindering her. The unconscious was the obstacle. In this case, therefore, the water signifies the unconscious, or, it were better to say, the *being unconscious* the being hidden, for the crab is also something unconscious, namely, the portion of the libido that was hidden in the unconscious.

IX.—THE DOMINANTS OF THE SUPER-PERSONAL UNCONSCIOUS.

The task now lies before us of raising the unconscious data and their relations that have been hitherto understood upon the objective plane, to the *subjective* plane. To this end we must once more separate them from their objects, conceiving them as images, related in a subjective way to function-complexes in the patient's own unconscious. Raised to the subjective plane, Mrs. X. is the person who showed the patient the way to do something that the patient herself feared while unconsciously desiring it. Mrs. X. therefore represents that which the patient would like to become, and yet does not quite want to. In a certain sense Mrs. X. is a picture of the patient's future character. The fascinating artist cannot be raised to the subjective plane, because the unconscious artistic gift lying dormant in the patient has already been covered over by Mrs. X. It would be quite right to say that the artist is the image of the masculine element in the patient, which not being consciously realised, is still lying in the unconscious. In a certain sense this is indeed true, the patient actually deluding herself as regards this matter. That is, she seems to herself to be particularly tender, sensitive and feminine, with nothing in the least masculine about her. She was indignantly amazed when I drew her attention to her masculine traits. But the reason why she is fascinated by something mysterious in the artist cannot be attributed to what is masculine in her. That seems to be

completely unknown to her. And yet it must be hiding somewhere, for she has produced this feeling out of herself.

Whenever a part of libido similar to this cannot be found, experience teaches us that it has always been *projected*. But into whom? Is it still attached to the artist? He has long ago disappeared from her horizon, and can hardly have taken the projection with him, because it was firmly fixed in the patient's unconscious. A similar projection is always actually present, that is, there must somewhere be some one upon whom this amount of libido is actually projected, otherwise she would have felt it consciously.

Thus we once more reach the objective plane, for we cannot discover this missing projection in any other way. The patient does not know any man except myself who means anything at all to her, and as her doctor I mean a good deal to her. Therefore she has probably projected this part upon me. It is true I had never noticed anything of the kind. But the exquisitely deceptive rôles are never presented to the analyst on the surface, coming to light always only outside the hour of treatment. I therefore carefully inquire: "Tell me what do I seem like to you when you are not with me? Am I just the same then?" Reply: "When I am with you, you are very pleasant and kind; but when I am alone, or have not seen you for rather a long time, then the picture I have in my mind of you changes in an extraordinary way. Sometimes you seem quite idealized, and then again different." She hesitates; I help by saying: "Yes, what am I like then?" Reply: "Sometimes quite dangerous, sinister like an evil magician or demon. I do not know how I get hold of such ideas. You are not really a bit like that."

So this part was attached to me as part of a transference; that is why it was lacking in her inventory. Therewith we recognize a further important thing. I was confused with (identified with) the artist, and in her unconscious fantasy she is Mrs. X. I was easily able to prove this fact by means of material that had previously been brought to light (sexual fantasies). But I myself then am the obstacle, the crab, that is hindering her from getting across. The state of affairs would be critical if at this particular point we were to limit ourselves to the objective plane of interpretation. What would be the use of my explaining: "But I am not this artist at all, I am not in the least weird as he is, nor am I like an evil magician." That would leave the patient quite unconvinced because she would know as well I do that the projection would continue to exist all the same, and that it is really I who

am hindering her further progress. It is at this point that many a treatment has come to a standstill. For there is no other way for the patient here of escaping from the embrace of the unconscious, but for the physician to raise himself to the subjective plane, where he is to be regarded as an image. But an image of what? This is where the greatest difficulty lies. The doctor will say: "An image of something in the patient's unconscious." But the patient may object: "What, am I to suppose myself to be a man, a mysteriously fascinating one to boot, a wicked wizard and a demon? No, I cannot accept that; it is nonsense. I'd sooner believe that you are all that." She is really, so to speak, quite right. It is too preposterous to want to transfer such things to herself. She cannot permit herself to be made into a demon, any more than can the physician. Her eyes flash, a wicked expression appears upon her face, a glimmer of an unknown hate never seen before, something snake-like seeming to creep into her. I am suddenly faced by the possibility of a fatal misunderstanding with her. What is it? Is it disappointed love? Is she offended? Does she feel depreciated? There seems to lurk something of the beast of prey, something really demoniac in her glance. Is she then after all a demon? Or am I myself the beast of prey, the demon, and is this a terrified victim sitting before me, who is trying to defend herself with the brute force of despair against my wicked spells? But either idea must be nonsense, phantastical delusion. What have I come in contact with? What new string is vibrating? But it is only for a passing moment. The expression upon the patient's face becoming quiet again, she says, as if relieved: "It is extraordinary. I feel as if you had touched the point which I could never get over in relation to my friend. It is a horrible feeling, something non-human, wicked, and cruel. I cannot describe how queer this feeling is. At such moments it makes me hate and despise my friend, although I struggle against it with all my might and main."

An explanatory light is thrown upon what has happened by this observation. I have now taken the friend's place. The friendship has been overcome, the ice of repression is broken. The patient has without knowing it entered upon a new phase of her existence. I know that now upon me will fall everything painful and bad in the relation to the friend. So also will whatever was good in it, although in violent conflict with the mysterious unknown quantity X, about which the patient could never get clear. A new phase, therefore, of the transference supervenes, which, however, does not as yet make clearly apparent what the X that is projected upon me consists of.

It is quite certain, that the most troublesome misunderstandings threaten if the patient should stick at this stage of the transference. In that case she will necessarily treat me as she treated her friend; that is the X will continually be somewhere in the air giving rise to misunderstandings. The end would probably be that she would see the evil demon in me, because she is quite unable to accept the fact that she is herself the demon. All insoluble conflicts are brought about in this way. And an insoluble conflict signifies a standstill in life.

Another possibility is, that the patient should disregard the obscure point by applying her old preventative against this new difficulty. That is, she would repress it again, instead of keeping it conscious, which is the necessary and obvious demand of the whole method. Nothing is gained by such repression; on the contrary, the X threatens more from the unconscious where it is considerably more unpleasant.

Whenever such an unacceptable image emerges, one must decide whether at bottom it is destined to represent a human quality or not. "Magician" and "demon" may represent qualities that are described in this particular fashion, in order that they may speedily be recognized as *not human but mythological qualities*. Magician and demon being mythological figures aptly express the unknown "non-human" feelings which had surprised the patient. These attributes are not applicable to a human personality; being as a rule judgments of character *intuitively* and not critically approved, which are projected upon our fellow-beings, inevitably doing serious injury to human relations.

Such attributes always indicate that contents of the super-personal or absolute unconscious are being projected. Neither demons nor wicked magicians are reminiscences of personal experiences, although every one has, of course, at some time or other heard or read of them. Although one has heard of a rattle-snake, it would hardly be appropriate to describe a lizard or a blind-worm as a rattle-snake, simply because one was startled by their rustling. Similarly, one would hardly term a fellow-being a demon, unless some kind of demoniacal influence were closely associated with him. If, however, the demoniacal influence were really part of his personal character, it would show itself everywhere, and then this human being would be a demon, a kind of werewolf. But such an ascription is mythology; in other words, it is from the collective and not from the individual psyche.

Inasmuch as through our unconscious we have a share in the historical collective psyche, we naturally dwell unconsciously in a world of werwolves, demons, magicians, etc., these being things which have always affected man most profoundly. We have just as much a part in gods and devils, saviours and criminals. But it would be absurd to want to ascribe to one's personal self the possibilities that are potentially existing in the human unconscious. It is, therefore, essential to make as clear a distinction as possible between the personal and the impersonal assets of our psyche. This is by no means intended to nullify the occasional great effects due to the existence of the contents of the absolute unconscious; but these contents of the collective psyche should be differentiated from those belonging to the individual psyche. For simple-minded people, of course, these things were never separated, the projection of gods, demons, etc., not having been understood as a psychological function were simply accounted concretistical realities. Their projectional character was never perceived. It was only with the advent of the epoch of scepticism that it was realized that the gods did not really exist except as projections. With that the matter was set at rest. But the psychological function corresponding to it was by no means set at rest, for it lapsed into the unconscious and began to poison men with a surplus of libido that had hitherto been invested in the cult of idols or gods. Obviously, the depreciation and repression of such a powerful function as that of religion has serious consequences for the psychology of the individual. The reflux of this libido strengthens the unconscious prodigiously, so that it begins to exercise a powerful compulsory influence upon consciousness and its archaic collective contents. One period of scepticism came to a close with the horrors of the French Revolution. At the present time we are again experiencing an ebullition of the unconscious destructive powers of the collective psyche. The result is an unparalleled general slaughter. That is just what the unconscious was tending towards. This tendency had previously been inordinately strengthened by the rationalism of modern life, which by depreciating everything irrational, caused the function of irrationalism to sink into the unconscious. But the function once in the unconscious will from thence work unceasing havoc, like an incurable disease whose centre cannot be eradicated. For then the individual and the nation alike are compelled to live irrationally, and even to apply their highest idealism and their best wit to make this madness of irrationalism as complete as possible. We see examples of this on a small

scale in our patient. She turned from a possibility of life that seemed to her irrational (Mrs. X.) in order to live it in a pathological form, to her own loss, and with an unsuitable object.

There is, indeed, no possible alternative but to acknowledge irrationalism as a psychological function that is necessary and always existent. Its results are not to be taken as concrete realities (that would involve repression), but as *psychological realities*. They are realities because they are *effective* things, that is, they are *actualities*.

The collective unconscious is the sediment of all the experience of the universe of all time, and is also an image of the universe that has been in process of formation for untold ages. In the course of time certain features have become prominent in this image, the so-called *dominants*. These dominants are the ruling powers, the gods; that is, the representations resulting from dominating laws and principles, from average regularities in the issue of the images that the brain has received as a consequence of secular processes.

In so far as the images formed in the brain are relatively faithful portrayals of psychic happenings they will correspond to their dominants; that is, their general characteristic features, made prominent by the accumulation of similar experiences, will correspond to certain physical fundamental facts that are also universal. Hence it is possible to transfer unconscious images to physical events direct as intuitive ideas; *e.g. ether* the primeval breath or soul-substance appears in man's conceptions the whole world over; so, too, *energy*, the magic force, which is equally widespread.

On account of their connection with physical things the dominants usually make their appearance as projections, appearing, indeed—if the projections are unconscious—in the persons of the immediate environment, as a rule in the form of abnormal under- or over-valuations, which excite misunderstandings, conflict, infatuations, and various kinds of folly. People say: "He makes a god of So-and-so," or "So-and-so is X.'s *bête noire*." They also give rise to the formation of modern myths, that is, fantastic rumours, suspicions and prejudices.

The dominants of the collective unconscious are therefore extremely important things of significant effect, to which great attention should be

paid. They must not be repressed, but must be given most careful consideration. They usually appear as projections, and since projections are only attached where there is some external stimulus, it is very difficult to appraise them aright, on account of the relation of the unconscious images with the object. If some one projects the dominant of "devil" into a fellow-being, this occurs because this other person has something in him that makes the attachment of the devil dominant possible. But that is by no means to say that this person is therefore, so to speak, a devil; on the contrary, he may be a particularly good fellow, but being antipathetic to the one who projects, a "devilish effect" is brought about between the two. This does not mean that the one who projects is a devil, although he must recognize that he too, just as much, has something devilish in him, and has been gulled by it, inasmuch as he projected it; but that does not make him a devil; indeed, he may be just as decent a man as the other. In such a case the appearance of the devil dominant means: the two persons are incompatible (for the moment and for the near future), wherefore the unconscious splits them asunder and holds them apart from each other.

One of the dominants that is almost always met in the analysis of projections of collective unconscious contents is the "magical demon;" it is of preponderating sinister effect. "The Golem," by *Meyrink*, is a good example of this; also the Thibetan wizard in Meyrink's "Fledermäusen," who lets the world-war loose by magic. Obviously Meyrink formed this image independently and freely out of his unconscious, by giving word and picture to a feeling similar to the one that my patient had projected upon me. The dominant of magic also appears in "Zarathustra," whilst in "Faust" it is, so to say, the hero himself.

The picture of this demon is the lowest and most elementary concept of God. It is the dominant of the primitive tribal magic-man, or a singularly gifted personality endowed with magic power. This figure very frequently makes an appearance in my patient's unconscious as a *dark-skinned being of Mongolian type*.

An important step forward has been taken by the recognition of the dominants of the absolute unconscious. The magical or demoniac effect of the fellow-being is made to disappear by the feeling being realised as a definite projection of the absolute unconscious. On the other hand, a completely new and unsuspected task now lies before us: namely, the

question in what way the ego should come to terms with this psychological non-ego. Should one rest satisfied with having verified the effective existence of unconscious dominants, leaving the matter to take care of itself?

To leave it at this point would be the means of creating a permanent state of dissociation in the subject, a conflict between the individual psyche and the collective psyche. Upon the one side we should have the differentiated modern ego, whilst upon the other a kind of uncivilized negro representative of a thoroughly primitive state. That would mean that we should have what really does exist, a crust of civilization over a dark-skinned brute; the cleavage would be distinct and demonstrable before our very eyes. But such a dissociation requires immediate synthesis and cultivation of what is undeveloped. There must be a union of these two aspects.

Before entering upon this new question let us first return to the dream from which we started. The discussion has given us a broader understanding of the dream, and especially of an essential part of it, namely, the fear. This fear is a demoniac fear of the dominants of the collective unconscious. We saw that the patient identifies herself with Mrs. X., expressing thereby that she also has some relation to the mysterious artist. It was apparent also that she identified the physician (myself) with the artist; and further that when taken upon the subjective plane, the image of the wizard dominants of the collective unconscious represented me.

All this is covered in the dream by the symbol of the crab which walks backwards. The crab stands for the living content of the unconscious that can by no means be exhausted or rendered inoperative by analysis on the objective plane. But what we were able to do was to *detach the mythological or collective psychological contents from the objects of consciousness, and to consolidate them as psychological realities outside the individual psyche.*

So long as the absolute unconscious and the individual psyche are coupled together without differentiation, no progress can be made, or, as the dream expresses it, no boundary be crossed. If the dreamer does nevertheless prepare to cross the boundary, the unconscious that was hitherto unnoticed becomes animated, seizing her and dragging her down. The dream and its

material characterize the absolute unconscious, on the one side as a lower animal living hidden in the depths of the water; and on the other side, as a dangerous disease that can only be cured by a timely operation. To what extent this characterization is appropriate has already been seen. As was pointed out, the animal symbol specially refers to what is *extra* human, that is super-personal; for the contents of the absolute unconscious are not merely the residue of archaic human functions, but also the residue of functions of the animal ancestry of mankind, whose duration of life was indeed vastly greater than the relatively brief epoch of specifically human existence. If such residues are active, they are apt, as nothing else is, not merely to arrest the progress of development, but also to divert the libido into regressive channels, until the quantity which the absolute unconscious has activated has been absorbed. The energy becomes profitable again after it has been consciously contrasted with the absolute unconscious, a process which enables it to be converted into a valuable source from which to draw. This transference of energy was established by religions in a concretistic manner through cultural communication with the gods (the dominants of the absolute unconscious). But these modes and customs are too much at variance with our intellect and our moral sense for us to be able to declare this solution of the problem as still binding, or even possible. If, on the other hand, we apprehend the images of the unconscious as collective unconscious dominants, therefore as collective-psychological phenomena or functions, this hypothesis is in no way opposed to our intellect and conscience. This solution is rationally acceptable. We have thus gained the possibility of coming to terms with the activated residues of our ancestral history. This mode of settlement makes it possible to traverse the boundary line hitherto limiting us, and is therefore appropriately termed the *transcendental function*, which is synonymous with progressive development to a new attitude. In the dream this development is indicated by the other side of the stream.

The similarity to hero-myths is striking. The typical combat of the hero with the monster (the unconscious content) frequently takes place on the banks of some water; sometimes at a ford. This circumstance is prominent in legends of Red Indians, as, for example, in Longfellow's "Hiawatha." In the decisive battle the hero is swallowed by a monster (*cf.* story of Jonah), as Frobenius^[246] has shown by means of extensive material. But inside the

monster the hero begins to come to terms with the beast in his own way: whilst the creature swims with him towards the sunrise, he cuts off a valuable piece of the viscera, *e.g.* the heart, by which the monster lived, that is, the valuable energy by which the unconscious was activated. Through this deed he kills the monster, who then drifts to land, where the hero, born anew through the transcendental function (the "night-journey under the sea" of Frobenius), steps forth, often in company with all those beings whom the monster had previously swallowed. This enables the normal state to be restored, as the unconscious having been robbed of its energy no longer occupies a preponderating position. In this way the myth—which is the dream of a people—graphically describes the problem with which our patient is concerned.^[247]

The problem of how to come to terms with the absolute unconscious is a question apart. I must content myself here with a general survey of the new theory of the unconscious up to the transcendental function, leaving the presentation of the transcendental function itself to a later work.

X.—THE DEVELOPMENT OF THE TYPES OF INTROVERSION AND EXTROVERSION IN THE ANALYTICAL PROCESS.

The description of the analysis of the unconscious would be incomplete if a word were not said about the question whether this method is equally applicable to the two types. As a matter of fact, both the development and the conception of the unconscious are different for each type. Although making every effort to find out a formulation that shall be as universally valid as possible, we must emphatically impress upon our minds the fact that the two modes of conception of the types are essentially different; a universal formulation that is just, only becomes possible when both standpoints are given equal consideration. I do not conceal from myself the fact that this subject is of less interest to the layman than to the specialist. Nevertheless, certain aspects of the question are of such a general character that the layman should not find the perusal of this last section entirely without interest.

Let us first consider the concept of the unconscious. I have here introduced the unconscious under the conception of a psychological function, namely, the function of the sum of all those psychic contents which do not reach the

threshold of consciousness. I have divided the unconscious materials into *personal*—that is to reminiscences attributable to personal experiences, combinations and tendencies—and into *impersonal* collective contents, that is, those whose contents cannot be attributed to personal experiences.

The contents of the psyche are fundamentally images indicating function on the one hand, and upon the other objects and the world generally. The conscious contains the recent object-images; the personal unconscious, the object-images of the individual past, so far as they have either been forgotten or repressed; whilst the absolute or collective unconscious contains the inherited world-images generally, under the form of primordial images or mythical themes. All psychic images have two sides: the one, being directed towards the object, is as faithful a likeness of the object as possible, framed without any intention or obligation to be anything else. The other side is directed towards the soul, that is towards the psychic function and the laws peculiar to it.

Let us take as an example, a primordial image out of a hero-myth. There is in the West a demon ancestress with a large mouth. The hero creeps into it, and at the same moment a certain little bird sings; the ancient dame shuts her mouth with a bang, and the hero disappears.

The side of the image directed towards the physical object means, the sun goes down in the evening into the mouth of the ocean. At this hour a certain little bird sings (which is an objective fact), and the sun disappears into the depths of the sea.

The side of the image directed towards the soul, that is the *idea*, signifies: The energy contained in consciousness disappears (like the sun in the evening) into the monster of the unconscious.

If we consider the collective-unconscious from the side of the soul or idea, it is something entirely distinct, and it must be differentiated, *abstracted* from the object, if its contents are to attain the perfection of an idea. If, on the other hand, we consider the collective-unconscious from the side of the physical object, that is as an image of the object, it is weaker and less clear than the object itself, and can only be brought to perfection if it is objectified, that is projected on to the object itself.

As previously explained, there are two types of human psychology that can be clearly distinguished, viz. introversion and extroversion. The introvert is characterised by the thought standpoint; the extrovert by the feeling standpoint. As I showed, they are quite different in their relation to the object: the introvert abstracting from the object and thinking about it, whilst the extrovert goes to the object and feels himself into it. The accent of value lies upon the ego for the introvert, but upon the object for the extrovert. The former's chief concern is the preservation of the ego; that of the latter the preservation of the object. The two types will adopt a different attitude towards the unconscious, namely, the introvert will and must seize the idea-side of the unconscious image; the extrovert, on the other hand, seizing the side of the physical reflection. The introvert will purify as far as possible the idea-side from the "alloy" of the concretistic admixture of the physical image, in order to arrive at the abstract idea; whilst, on the other hand, the extrovert will purify the physical image as far as possible from the "phantastic" admixture of the enveloping ideas. The former, by raising himself to a world of idea, will endeavour to overcome the disturbing influence of the unconscious; whilst the latter will approach the object as near as possible and project the unconscious image into the physical object, thus freeing himself from the grip of the unconscious.

What for the extrovert is a phantastic and disturbing admixture in the unconscious picture, is for the introvert precisely that which has the most value, for it is the germ of the pure idea, and *vice versa*; what for the introvert are merely concretistical "imperfections," survivals of a physical origin, are for the extrovert a most valuable hint, the bridge by which the unconscious can be united with the object.

This description makes it manifest that the two types go contrary ways in the course of the development of their unconscious, arriving therefore at opposite extremes: the one at the idea, the other at the object of his feeling. The psychological characteristics of the types are eventually pushed to extremes, where according to the enantiomorphic law the moment has arrived when in each case the "other" function enters into its fully acknowledged right, that is, feeling in the case of the introvert, and thought in that of the extrovert. The introvert attains the lacking function of autonomous feeling by means of a differentiation and enhancement of his thought; whilst the extrovert, on the other hand, attains his thinking by the

way of an increasingly differentiated love. These functions that hitherto were secondary are found at first in the unconscious, gradually reaching consciousness in the course of development. At first they are unconscious functions in a state that is more or less incompatible with consciousness and have the typical qualities of unconscious contents. These qualities are such as are not tolerated in consciousness. The lunatic Schreber^[248] says most aptly that the language of God (the unconscious) is a somewhat archaic but vigorous German, of which he gives a few striking examples. As the contrary function that emerges from the unconscious into consciousness differs to such an extent from what appears to be acceptable to consciousness, the necessity arises of a technique for coming to terms with the contrary function. It is impossible to accept the contrary function as it stands, as it always drags extraneous qualities and accompanying circumstances with it from the absolute unconscious. Through the above-described development the extrovert has acquired an adaptation to the object that is absolutely real and free from all phantasies; he will therefore be able to turn his attention towards the "alloy" which for the introvert was the valuable germ of idea. From this he will then develop similar ideas to those which the introvert has already developed. *Vice versâ*, the introvert will now be able to turn his attention to those materials which before he was obliged to reject, as being side-tracks on the road to physical reality; that is, he will carry out the same clearing and winnowing in his feeling-relations, that the extrovert has already completed.

The development of the contrary function that was hitherto unconscious, leads to individuation beyond the type, and thereby to a new relation to the world and mind. The process which begins with the complementation of the types is the transcendental function, which leads to the new adaptation by means of the clearing and winnowing of unconscious feelings and thoughts that have been brought up by the contrary function that had been neglected.

Following the old maxim: "naturam si sequemur ducem nunquam aberrabimus," we have obeyed the natural impulse of the thinker to carry the principle of thought through to its utmost perfection attainable, as also that of the feeler, of carrying the principle of feeling through to the end. By these means the salutary extreme was produced, to wit, the hunger, the desire for the compensatory function. For, by means of thought, the one is landed in a lifeless ice-cold world of crystalline ideas; whereas, by means of

feeling, the other reaches a limitless ocean of never ending flood of sentiment. The former will, therefore, yearn for living warmth of feeling, and the latter for the restrictive precision and solidity of thought.

An enrichment of the individual is attained by this compensatory process, giving him greater decision and the possibility of a harmony that is complete in itself. The assimilation of the contrary function discloses new inner springs, which guarantee to the individual considerably greater independence from external conditions. This acquisition is an indisputable advantage that none would like to surrender in face of the fact so unavoidably connected with it, that a new adaptation and orientation of this kind places the individual in a certain contrast to the great bulk of people who yet have the old attitude. This contrast is no drawback; it is rather a welcome and effective spur to life and work, for thereby is created the channel required by our psychic energy for its development.

XI.—GENERAL REMARKS ON THE THERAPY.

I have still to draw the reader's attention to an important fact. Throughout the course of this paper, I have seemed to associate the idea of disturbance or even of peril with the unconscious. But it would give a false impression if we were only to emphasize the dangerous side of the unconscious. *The unconscious is a source of danger when the individual is not at one with it.* If we succeed in establishing the function or attitude that I call transcendental, the disharmony ceases, and we are permitted to enjoy the favourable side of the unconscious. In such case the unconscious vouchsafes us that furtherance and assistance which bountiful Nature is always ready to give to man in overflowing abundance. The unconscious possesses possibilities of wisdom that are completely closed to consciousness, for the unconscious has at its disposal not only all the psychic contents that are under the threshold because they had been forgotten or overlooked, but also the wisdom of the experience of untold ages, deposited in the course of time and lying potential in the human brain. The unconscious is continually active, creating combinations of its materials; these serve to indicate the future path of the individual. It creates prospective combinations just as our consciousness does, only they are considerably superior to the conscious combinations both in refinement and

extent. The unconscious may therefore be an unparalleled guide for human beings.

The reader must on no account suppose that the complicated psychological changes described must all be passed through in every individual case. In practice the treatment is adjusted according to the therapeutic result attained. The particular result arrived at may be reached at any stage of the treatment, quite apart from the seriousness or duration of the malady. The treatment of a serious case may last a long time, without the higher phases of the evolution ever being reached, or needing to be reached. There are comparatively few people who, after attaining the desired therapeutical result, pursue the further stages of evolution for the sake of their own development. It is, therefore, not the seriousness of the case which obliges one to pass through the whole development. In any case, only those people attain a higher degree of differentiation who are by nature destined and called to it, that is, who have both a capacity and tendency towards the higher differentiation. This is a matter in which people are extremely different, just as among species of animals there are some that are stationary and conservative, and others that are evolutionary. Nature is aristocratic, but not in the sense of having reserved the possibility of differentiation exclusively for those species that stand high. Similarly, the possibility of the psychological development of human beings is not reserved for specially *gifted* individuals. In other words: neither special intelligence nor any other talent is necessary in order to achieve a far-reaching psychological development, inasmuch as in this development moral qualities step in to supplement where intellect does not suffice. But it must not be supposed under any circumstances that the treatment consists in grafting general formulas and complicated doctrines on to people; this is not so. Each one can acquire that which he needs, after his own fashion and in his own language. What I have here presented is only the intellectual formulation of the subject, founded upon preliminary scientific study of an empirical as well as a theoretical nature; but this formulation does not become a subject of discussion in the ordinary practical analytical work. The brief notes of cases that I have inserted give an approximate idea of the practical side of analysis.

The reader should realize that our new understanding of psychology has a side that is entirely practical, and another that is entirely theoretical. It is not

merely a practical method of treatment or education, but it is also a scientific theory, that is closely related to other co-ordinated sciences.

CONCLUSION.

In conclusion, I must beg the reader to pardon me for having ventured to say so many new and abstruse things in such a brief compass. I lay myself open to adverse criticism, because I conceive it to be the duty of every one who isolates himself by taking his own path, to tell others what he has found or discovered, whether it be a refreshing spring for the thirsty, or a sandy desert of sterile error. The one helps, the other warns. Not the opinion of any individual contemporary will decide the truth and error of what has been discovered, but rather future generations and destiny. There are things that are not yet true to-day, perhaps we are not yet permitted to recognize them as true, although they may be true to-morrow. Therefore every pioneer must take his own path, alone but hopeful, with the open eyes of one who is conscious of its solitude and of the perils of its dim precipices. Our age is seeking a new spring of life. I found one and drank of it and the water tasted good. That is all that I can or want to say. My intention and my duty to society is fulfilled when I have described, as well as I can, the way that led me to the spring; the reproaches of those who do not follow this way have never troubled me, nor ever will. New ideas always encounter resistance from the old. That always was and always will be the case; it appertains to the self-regulation of mental progress.

CHAPTER XV

THE CONCEPTION OF THE UNCONSCIOUS^[249]

I.—THE DISTINCTION BETWEEN THE PERSONAL AND THE IMPERSONAL UNCONSCIOUS

Since the breach with the Viennese school upon the question of the fundamental explanatory principle of analysis—that is, the question if it be sexuality or energy—our concepts have undergone considerable development. After the prejudice concerning the explanatory basis had been removed by the acceptance of a purely abstract view of it, the nature of which was not anticipated, interest was directed to the concept of the unconscious.

According to Freud's theory the contents of the unconscious are limited to infantile wish-tendencies, which are repressed on account of the incompatibility of their character. Repression is a process which begins in early childhood under the moral influence of environment; it continues throughout life. These repressions are done away with by means of analysis, and the repressed wishes are made conscious. That should theoretically empty the unconscious, and, so to say, do away with it; but in reality the production of infantile sexual wish-fantasies continues into old age.

According to this theory, the unconscious contains only those parts of the personality which might just as well be conscious, and have really only been repressed by the processes of civilisation. According to Freud the essential content of the unconscious would therefore be *personal*. But although, from such a view-point the infantile tendencies of the unconscious are the more prominent, it would be a mistake to estimate or define the unconscious from this alone, for it has another side.

Not only must the repressed materials be included in the periphery of the unconscious, but also all the psychic material that does not reach the threshold of consciousness. It is impossible to explain all these materials by

the principle of repression, for in that case by the removal of the repression a phenomenal memory would be acquired, one that never forgets anything. As a matter of fact repression exists, but it is a special phenomenon. If a so-called bad memory were only the consequence of repression, then those persons who have an excellent memory should have no repression, that is, be incapable of being neurotic. But experience teaches us that this is not the case. There are, undoubtedly, cases with abnormally bad memories, where it is clear that the main cause must be attributed to repression. But such cases are comparatively rare.

We therefore emphatically say that the unconscious contains all that part of the psyche that is found under the threshold, including subliminal sense-perceptions, in addition to the repressed material. We also know—not only on account of accumulated experience, but also for theoretical reasons—that the unconscious must contain all the material that has *not yet* reached the level of consciousness. These are the germs of future conscious contents. We have also every reason to suppose that the unconscious is far from being quiescent, in the sense that it is inactive, but that it is probably constantly busied with the formation and re-formation of so-called unconscious phantasies. Only in pathological cases should this activity be thought of as comparatively autonomous, for normally it is co-ordinated with consciousness.

It may be assumed that all these contents are of a personal nature in so far as they are acquisitions of the individual life. As this life is limited, the number of acquisitions of the unconscious must also be limited, wherefore an exhaustion of the contents of the unconscious through analysis might be held to be possible. In other words, by the analysis of the unconscious the inventory of unconscious contents might be completed, possibly in the sense that the unconscious cannot produce anything besides what is already known and accepted in the conscious. Also, as has already been said, we should have to accept the fact that the unconscious activity had thereby been paralysed, and that by the removal of the repression we could stop the conscious contents from descending into the unconscious. Experience teaches us that is only possible to a very limited extent. We urge our patients to retain their hold upon repressed contents that have been brought to consciousness, and to insert them in their scheme of life. But, as we may daily convince ourselves, this procedure seems to make no impression upon

the unconscious, inasmuch as it goes on producing apparently the same phantasies, namely, the so-called infantile-sexual ones, which according to the earlier theory were based upon personal repressions. If in such cases analysis be systematically continued, an inventory of incompatible wish-phantasies is gradually revealed, whose combinations amaze us. In addition to all the sexual perversions every conceivable kind of crime is discovered, as well as every conceivable heroic action and great thought, whose existence in the analysed person no one would have suspected.

In order to give an example of this, I would like to refer to Maeder's Schizophrenic patient who called the world his picture-book. He was a locksmith's apprentice who fell ill very early in life; he had never been blessed with intellectual gifts. As regards his idea that the world was his picture-book and that he was turning its pages over when he looked about in the world, it is just Schopenhauer's world, conceived as will and representation, expressed in primitive picture-language. This idea has just as universal a character as Schopenhauer's. The difference consists in the fact that the patient's notion has stood still at an embryonic stage in a process of growth, whereas with Schopenhauer the same idea has been changed from a mere image into an abstraction expressed in terms that are universally valid.

It would be false to assume that the patient's idea had a personal character and value. That would be to attribute to him the dignity of a philosopher. But he alone is a philosopher who raises an image that has naturally sprung up into an abstract idea, thereby translating it into terms of universal validity. Schopenhauer's philosophical conception is his personal value, whereas the notion of the patient has merely an impersonal value of natural growth, in which personal proprietary rights can only be acquired by making an abstraction of the images, and translating them into terms that are universally valid. But it would be wrong if an exaggerated sense of the value of this achievement led us to ascribe to the philosopher the merit of having made or conceived the original image itself. The primordial image has also sprung up naturally in the philosopher, and is nothing but a part of the universal human heritage in which, theoretically at least, every one has a share. The golden apples come from the same tree whether they are gathered by a locksmith's apprentice or a Schopenhauer.

The recognition of such primordial images obliges me to differentiate between the contents of the unconscious; a differentiation of another kind than that between the pre-conscious and unconscious, or between the subconscious and unconscious. The justification for those distinctions cannot be discussed here; they have a value of their own and probably merit to be carried further as affording a point of view. The differentiation which I propose follows obviously from what has previously been said, namely, that in the so-called unconscious we must differentiate a layer which may be termed the *personal unconscious*. The materials contained in this layer are of a personal kind, inasmuch as on the one hand they may be characterised as acquisitions of the individual existence, and on the other as psychological factors which might just as well be conscious. It is, for instance, comprehensible that incompatible psychological elements succumb to repression on the one hand and are therefore unconscious, but on the other hand there exists the possibility of bringing the repressed contents into consciousness and keeping them there, once they are known and recognised. We recognise these materials as personal contents, because we can prove their effects, their partial appearance, or their origin to lie in our personal past. They are integral constituents of the personality, and belong to a complete inventory of the same. They are constituents whose omission in consciousness implies an inferiority in one respect or another, not indeed an inferiority bearing the psychological character of an organic deformity or a natural defect, but rather the character of a neglect which arouses a moral reaction. The feeling of moral inferiority always indicates that in the portion omitted is something that according to the feelings should not be missing; or in other words, could be conscious if we took sufficient trouble about it. The sense of moral inferiority is not the result of a collision with the universal, in a certain sense arbitrary, moral law, but rather the result of a conflict with the personal ego, which by reason of the psychic economy demands an adjustment of the deficiency. Wherever a feeling of inferiority appears, it reveals not only the presence of a demand for the assimilation of an unconscious constituent, but also the possibility of such an assimilation. It is, after all, a person's moral qualities that make him assimilate his unconscious self and retain it in consciousness, whether he be forced to it by a recognition of its necessity, or by a painful neurosis. He who continues to tread this path of the realisation of his unconscious self, necessarily transposes the content of the personal unconscious into

consciousness, whereby the periphery of the personality is considerably enlarged.

II—THE CONSEQUENCES OF THE ASSIMILATION OF THE UNCONSCIOUS.

This process of assimilating the unconscious leads to remarkable results. Some people build up from it an unmistakable, even unpleasantly increased self-consciousness or self-confidence; they "know everything," and are completely aware of everything so far as their unconscious is concerned. They think themselves accurately informed about everything that comes up from the unconscious. Others are increasingly oppressed by the contents of the unconscious, they lose their self-reliance or their self-consciousness more and more, and come near to a state of depressed resignation in regard to all the extraordinary things the unconscious produces. The former undertake in the exuberance of their self-confidence, a responsibility for their unconscious that goes much too far, beyond every reasonable possibility; the latter ultimately decline to accept any responsibility in the depressing recognition of the powerlessness of the ego confronted by relentless Destiny, working through the unconscious.

If we give the two types close analytical consideration, we shall discover that behind the optimistic self-confidence of the former there is hidden a just as deep, or rather a far deeper, helplessness; a helplessness to which the conscious optimism acts as an unsuccessful effort at compensation. Behind the pessimistic resignation of the latter there is hidden a defiant desire for power, far exceeding in self-confidence the conscious optimism of the former type.

This condition of the personality may well be expressed by the idea of "God-Almightiness" (Gottähnlichkeit),^[250] to which *Adler* has particularly drawn our attention.

When the devil wrote the serpent's words in the student's album, *Eritis sicut Deus scientes bonum et malum*, he added:

"Follow the ancient text and the snake thou wast ordered to trample!
With all thy likeness to God, thou'lt yet be a sorry example."

The idea of "likeness to God," or "God-Almightiness," is not a scientific one, although it characterises the psychological state of affairs most exactly. Still we must examine whence this attitude comes, and ask why it merits the name of "God-Almightiness." As the expression denotes, the patient's abnormal condition is constituted by the fact that he ascribes to himself qualities or values which obviously do not belong to him, for "God-Almightiness" means being like the spirit which is set above the human spirit.

If for psychological purposes we abstract from the hypostasis of the God-idea, we find that this expression does not only include every dynamic fact discussed in my book on "The Psychology of the Unconscious,"^[251] but also a certain mental function having a collective character, which is of another order from that of the individual character of the mind. In the same way as the individual is not only an isolated and separate, but also a social being, so also the human mind is not only something isolated and absolutely individual, but also a collective function. And just as certain social functions or impulses are, so to speak, opposed to the ego-centric interests of the individual, so also the human mind has certain functions or tendencies which, on account of their collective nature, are to some extent opposed to the personal mental functions. This is due to the fact that every human being is born with a highly differentiated brain, which gives him the possibility of attaining a rich mental function that he has neither acquired ontogenetically nor developed. In proportion as human brains are similarly differentiated, the corresponding mental functions are collective and universal. This circumstance explains the fact that the unconscious of far-separated peoples and races possesses a remarkable number of points of agreement. One example among many others which has been demonstrated is the extraordinary unanimity shown by the autochthonous forms and themes of myths.

The universal similarity of brains results in a universal possibility of a similar mental function. This function is the collective psyche, which is divided into *collective mind* and *collective soul*.^[252] In so far as there exist differentiations corresponding to race, descent, or even family, so, beyond the level of the "universal" collective psyche, we find a collective psyche limited by race, descent, and family. To quote *P. Janet*, the collective psyche contains the "parties inférieures" of the mental function, that is, the part of the mental function which, being fixed and automatic in its action, inherited and present everywhere, is therefore super-personal or impersonal. The conscious and the personal unconscious contain as personal differentiations the "parties supérieures" of the mental function, therefore the part that has been acquired and developed ontogenetically.

An individual therefore who joins the *a priori* and unconsciously-given collective psyche on to his ontogenetically acquired assets, enlarges thereby the periphery of his personality in an unjustifiable way, with the corresponding consequences. Inasmuch as the collective psyche is the "partie inférieure" of the mental function, and therefore is the fundamental structure underlying every personality, it weighs heavily upon and depreciates the personality; a fact that is expressed in the afore-mentioned stifling of self-confidence, and in the unconscious increase of the ego-emphasis up to the point of a morbid will to power. Inasmuch as the

collective psyche ranks even above the personality, because it is the mother foundation upon which all personal differentiations are based, and because it is the common mental function of the sum total of the individual, therefore its incorporation in the personality may evoke inflation of self-confidence, an inflation which is then compensated by an extraordinary sense of inferiority in the unconscious.

*A dissolution of the pairs of opposites in the personality sets in if, through the assimilation of the unconscious, the collective psyche be included in the inventory of the personal mental functions. Alongside the pairs of opposites already alluded to that are so particularly evident in the neurotic, viz. megalomania and sense of inferiority, there are also many other pairs, of which I will only mention the specifically moral pair, that is, good and evil (*scientes bonum et malum*). They accompany the increase or depreciation of self-confidence. The specific virtues and vices of humanity are contained in the collective psyche, just as everything else is. One man ascribes all the collective virtue to himself as his own personal merit; another accounts as personal guilt what is but collective vice. Both are just as illusory as the sense of greatness and of inferiority, for imaginary virtues as well as imaginary vices are only the pairs of moral opposites contained in the collective psyche, which have become perceptible or have artificially been made conscious. How far the collective psyche contains these pairs of opposites is shown by primitive peoples, whose great virtue is praised by one observer; whereas another observer of the same race reports only the worst impressions. Both views are true of primitive man, whose personal differentiation is only beginning; his mental function is essentially collective. He is more or less identified with the collective psyche, and therefore without any personal responsibility or inner conflict; his virtues and vices are collective. Conflict only begins when a conscious personal development of the mind has already started, whereby the reason becomes aware of the irreconcilable nature of the pairs of opposites. The struggle to repress is the consequence of this realisation. Man wants to be good, therefore the bad must be repressed; this puts an end to the paradise of the collective psyche.*

The repression of the collective psyche, in so far as it was conscious, was a necessity for the development of the personality, because collective psychology and personal psychology are in a certain sense irreconcilable. In the history of thought, whenever a fresh psychological attitude acquires collective value the formation of schisms begins. Nowhere is this more clearly seen than in the history of religion. A collective point of view, although it may be necessary, is always dangerous for the individual. It is dangerous because it is apt to choke and smother personal differentiation. It has derived this capacity from the collective psyche, which is itself a result of psychological differentiation of the strong gregarious instincts of humanity. Collective thought and feeling, and collective accomplishment, are relatively easy in comparison with individual function and performance; a fact that is only too prone to lead to a fining down to the collective level, and is peculiarly disastrous to personal development. The concomitant loss of personality is replaced—as is always the case in psychology—by an unconscious all-compelling binding to and identification with the collective psyche. It cannot be denied, and should be warningly emphasized that in the analysis of the unconscious, the collective psychology is merged into the personal psychology, with the afore-mentioned unpleasant consequences. These consequences are either bad for the individual's vital feeling (*Lebensgefühl*), or they injure his fellow-beings if he have any power over his environment. Being identified with the collective psyche he will inevitably try to force the claims of his unconscious upon others, for identification with the collective psyche is accompanied by a

feeling of universal validity ("God-Almightiness"), which disregards the different psychology of his fellows.

The worst abuses of this kind may be removed by a clear understanding and appreciation of the fact that there are totally different psychological types, and that a psychology of one type cannot be forced into the mould of another. It is indeed almost impossible for one type to understand the other completely, and a perfect comprehension of another's individuality is impossible. *Due regard for another's individuality* is not only advisable but is absolutely essential in analysis, if the development of the other's personality is not to be stifled. It should not be forgotten that the one type thinks that he is leaving another person free when he grants him freedom of action, and the other type when he grants him freedom of thought. In analysis both must be conceded, in so far as reasons of self-preservation permit the analyst to accord them. An excessive desire to understand or explain things is just as useless and injurious as a lack of comprehension.

The collective natural propensities and primary forms of idea and feeling which analysis of the unconscious has shown to be effective are an acquisition for the conscious personality which cannot be admitted unreservedly without prejudicial results.

In practical treatment^[253] it is therefore of the utmost importance to keep the aim of individual development constantly before us. If for instance the collective psyche be conceived as a personal possession or as a personal burden, an unbearable weight or strain is put upon the personality. Hence we must make a clear distinction between the personal and the collective psyche. In practice this distinction is not easy because the personal grows out of the collective psyche, and is most closely joined with it. It is therefore difficult to say which materials are to be termed collective and which personal. There is no doubt, for instance, that the archaic symbols so often found in phantasies and dreams are collective factors. All primary propensities and forms of thought and feeling are collective; so is everything about which men are universally agreed, or which is universally understood, said or done. Upon close consideration it is astonishing to note how much of our so-called individual psychology is really collective; so much that the individual element quite disappears. Individuation, however, is an indispensable psychological requirement. The crushing predominance of what is collective should make us realise what peculiar care and attention must be given to the delicate plant "individuality," if it is to develop.

Human beings have a capacity which is of the utmost use for purposes of collectivism and most prejudicial to individuation, and that is the capacity to *imitate*. Collective psychology cannot dispense with imitation, without which the organization of the State and Society would be impossible. Imitation includes the idea of suggestibility, suggestive effect, and mental infection.

But we see daily how the mechanism of imitation is used, or rather abused, for the purposes of personal differentiation; some prominent personality, or peculiar trait or activity is simply imitated, which at least brings about an external differentiation from the environment. As a rule this delusive attempt to attain individual differentiation by means of imitation comes to a standstill as mere affectation, the individual remaining on the same plane as before, only a few degrees more sterile than formerly, and under an unconscious compulsory bondage to his environment.

In order to find out what is really individual in us, we should have to give the matter deep thought, and we should certainly become aware how exceedingly difficult such a discovery is.

III.—THE INDIVIDUAL AS AN EXCERPT OF THE COLLECTIVE PSYCHE.

We now come to a problem the overlooking of which would cause the greatest confusion.

As I said before, the immediate result of the analysis of the unconscious is that additional personal portions of the unconscious are incorporated into the conscious. I called those parts of the unconscious which are repressed but capable of being made conscious, *the personal unconscious*. I showed moreover that through the annexation of the deeper layers of the unconscious, which I called the *impersonal unconscious*, an extension of the personality is brought about which leads to the state of God-Almightiness ("Gottähnlichkeit"). This state is reached by a continuation of the analytical work, by means of which we have already re-introduced what is repressed to consciousness. By continuing analysis further we incorporate some distinctly impersonal universal basic qualities of humanity with the personal consciousness, which brings about the aforesaid enlargement, and this to some extent may be described as an unpleasant consequence of analysis.

From this standpoint, the conscious personality seems to be a more or less arbitrary excerpt of the collective psyche. It appears to consist of a number of universal basic human qualities of which it is *à priori* unconscious, and further of a series of impulses and forms which might just as well have been conscious, but were more or less arbitrarily repressed, in order to attain that excerpt of the collective psyche, which we call personality. The term *persona* is really an excellent one, for *persona* was originally the mask which an actor wore, that served to indicate the character in which he appeared. For if we really venture to undertake to decide what psychic material must be accounted personal and what impersonal, we shall soon reach a state of great perplexity; for, in truth, we must make the same assertion regarding the contents of the personality as we have already made with respect to the impersonal unconscious, that is to say that it is *collective*, whereas we can only concede *individuality to the bounds of the persona*, that is to the particular choice of personal elements, and that only to a very limited extent. It is only by virtue of the fact that the *persona* is a more or less accidental or arbitrary excerpt of the collective psyche that we can lapse into the error of deeming it to be *in toto* individual, whereas as its name denotes, it is only a mask of the collective psyche; *a mask which simulates individuality*, making others and oneself believe that one is individual, whilst one is only acting a part through which the collective psyche speaks.

If we analyse the *persona* we remove the mask and discover that what appeared to be individual is at bottom collective. We thus trace "the Little God of the World" back to his origin, that is, to a personification of the collective psyche. Finally, to our astonishment, we realise that the *persona* was only the mask of the collective psyche. Whether we follow Freud and reduce the primary impulse to sexuality, or Adler and reduce it to the elementary desire for power, or reduce it to the general principle of the collective psyche which contains the principles of both Freud and Adler, we arrive at the same result; namely, the dissolution of the personal into the collective. Therefore in every analysis that is continued sufficiently far, the moment arrives when the aforesaid God-Almightiness must be realised. This condition is

often ushered in by peculiar symptoms; for instance, by dreams of flying through space like a comet, of being either the earth, the sun, or a star, or of being either extraordinarily big or small, of having died, etc. Physical sensations also occur, such as sensations of being too large for one's skin, or too fat; or hypnagogic feelings of endless sinking or rising occur, of enlargement of the body or of dizziness. This state is characterised psychologically by an extraordinary loss of orientation about one's personality, about what one really is, or else the individual has a positive but mistaken idea of that which he has just become. Intolerance, dogmatism, self-conceit, self-depreciation, contempt and belittling of "not analysed" fellow-beings, and also of their opinions and activities, all very frequently occur. An increased disposition to physical disorders may also occasionally be observed, but this occurs only if pleasure be taken therein, thus prolonging this stage unduly.

The wealth of the possibilities of the collective psyche is both confusing and dazzling. The dissolution of the persona results in the release of phantasy, which apparently is nothing else but the functioning of the collective psyche. This release brings materials into consciousness of whose existence we had no suspicion before. A rich mine of mythological thought and feeling is revealed. It is very hard to hold one's own against such an overwhelming impression. That is why this phase must be reckoned one of the real dangers of analysis, a fact that should not be concealed.

As may easily be understood, this condition is hardly bearable, and one would like to put an end to it as soon as possible, for the analogy with a mental derangement is too close. The essence of the most frequent form of derangement—dementia præcox or schizophrenia—consists, as is well known, in the fact that the unconscious to a large extent ejects and replaces the conscious. The unconscious is given the value of reality, being substituted for the reality function. The unconscious thoughts become audible as voices, or visible as visions, or perceptible as physical hallucinations, or they become fixed ideas of a kind that supersede reality. In a similar, although not in the same way, by the resolution of the persona of the collective psyche, the unconscious is drawn into the conscious. The difference between this state of mind and that of mental derangement consists in the fact that the unconscious is brought up by the help of the conscious analysis; at least that is the case in the beginning of analysis, when there are still strong cultural resistances against the unconscious to be overcome. Later on, after the removal of the barriers erected by time and custom, the unconscious usually proceeds, so to say, in a peremptory manner, sometimes even discharging itself in torrents into the consciousness. In this phase the analogy with mental derangement is very close. But it would only be a real mental disorder should the content of the unconscious *take the place of the conscious reality*, that is, in other words, if the contents of the unconscious were believed absolutely and without reserve.

IV.—THE ENDEAVOURS TO FREE THE INDIVIDUALITY FROM THE COLLECTIVE PSYCHE.

1. The Regressive Restoration of the Persona.

The unbearableness of thus being identified with the collective psyche forces us to find a radical solution. There are two ways open. The first possibility is the regressive one of trying to restore the persona to its former condition, by endeavouring to restrain the unconscious by the application of a reductive theory; for instance, by declaring it to be nothing but long-

repressed and overdue infantile sexuality, for which it would really be best to substitute the normal sexual function. This solution is based upon the unmistakable sexualistic symbolism of the language of the unconscious, and upon the concretistic interpretation of the same. Or an attempt may be made to apply the power theory, by conceiving the God-Almightiness as a "virile protest," and as an infantile striving for power and self-preservation: a theory for which support is found in the unmistakable pretensions to power that the unconscious material contains. A further possibility would be to declare the unconscious to be the archaic collective psychology of primitive man, an explanation that would not only cover the sexualistic symbolism and the "God-Almighty" aiming for power of the unconscious content, but would also apparently do justice to the religious, philosophical, and mythological aspects and tendencies of the unconscious content. In every case the conclusion arrived at is the same, viz. that the unconscious is nothing but this or that, which has already been adequately recognised and acknowledged as infantile, useless, meaningless, impossible, and out of date. There is nothing to be done but to shrug one's shoulders and resign one's self to the inevitable.

To the patient there seems to be no alternative, if one wishes to continue to live sensibly, but to restore in so far as is possible that extract of the collective psyche termed persona, to lay the fact of analysis silently aside, and do one's utmost to forget that one possesses an unconscious. We shall find support in Faust's words:—

"The sphere of earth is known enough to me;
The view beyond is barred immutably:
A fool, who there his blinking eyes directeth,
And o'er his clouds of peers a place expecteth!
Firm let him stand, and look around him well!
This world means something to the capable.
Why needs he through Eternity to wend?
He here acquires what he can apprehend.
Thus let him wander down his earthly day;
When spirits haunt go quietly his way;
In marching onward, bliss and torment find,
Though every moment, with unsated mind!"

This would be a happy solution if one really could succeed in throwing off the unconscious to such an extent as to withdraw the libido from it, and so render it inoperative. But experience proves that energy cannot be withdrawn from the unconscious; it continues operative, for the unconscious contains and is indeed itself the source of libido, from which issue the primary psychic elements, thought-feelings, or feeling-thoughts—undifferentiated germs of idea and sentiment. It would therefore be a delusion to believe that by means of some, so to say, magical theory or method, the libido could be conclusively wrested from the unconscious, or that it could be to a certain extent disconnected. One may yield to this illusion for a time, but some day he will be obliged to declare with Faust:—

"Now fills the air so many a haunting shape,
That no one knows how best he may escape.
What though one day with rational brightness beams,
The night entangles us in webs of dreams.

From our young fields of life we come, elate:
There croaks a bird; what croaks he? Evil fate!
By superstition constantly ensnared,
It grows to us and warns and is declared.
Intimidated thus we stand alone.—
The portal jars, yet entrance is there none.
Is any one here?

CARE: Yes! must be my reply.

FAUST: And, thou, who art thou, then?

CARE: Well—here am I.

FAUST: Avaunt!

CARE: *I am where I should be:*
Though no ear should choose to hear me,
Yet the shrinking heart must fear me;
Though transformed to mortal eyes,
Grimmest power I exercise."

The unconscious cannot be "analysed" to a finish, and thus brought to a standstill. No one can wrest active force from it for any length of time. Therefore to act according to the method just described is only to deceive one's self, and is nothing but a new edition of an ordinary repression.

2. *The Identification with the Collective Psyche.*

The second way would be that of identification with the collective psyche. That would mean the symptom of "God-Almightiness" developed into a system; in other words, one would be the fortunate possessor of the absolute truth, that had yet to be discovered; of the conclusive knowledge, which would be the people's salvation. This attitude is not necessarily megalomania ("Grössenwahn") in a direct form, but the well-known milder form of having a prophetic mission. Weak minds which, as is so often the case, have correspondingly an undue share of vanity and misplaced naïveté at their disposal, run a considerable risk of succumbing to this temptation. The obtaining access to the collective psyche signifies a renewal of life for the individual, whether this renewal of life be felt as something pleasant or unpleasant. It would seem desirable to retain a hold upon this renewal: for one person, because it increases his feeling for life ("Lebensgefühl"); for another, because it promises a great accretion to his knowledge. Therefore both of them, not wishing to deprive themselves of the rich values that lie buried in the collective psyche, will endeavour by every means possible to retain their newly gained union with the primal cause of life. Identification appears to be the nearest way to it, for the merging of the persona in the collective psyche is a veritable lure to unite one's self with this "ocean of divinity," and, oblivious of the past, to become absorbed in it. This piece of mysticism belongs to every finer individual, just as the "yearning for the mother"—the looking back to the source whence one originated—is innate in every one.

As I have demonstrated explicitly before,^[254] there is a special value and a special necessity hidden in the regressive longing—which, as is well-known, Freud conceives as "infantile fixation" or as "incest-wish." This necessity and longing is particularly emphasized in myths, where it is always the strongest and best of people, in other words, the hero, who follows the regressive longing and deliberately runs into danger of letting himself be devoured by the monster of the maternal first cause. But he is a hero only because, instead of letting himself be finally devoured by the monster, he conquers it, and that not only once but several times. It is only through the conquest of the collective psyche that its true value can be attained, whether it be under the symbol of capture of treasure, of an invincible weapon, of a magical means of defence, or whatever else the myth devises as the most desirable possession. Hence whoever identifies himself with the collective psyche, also reaches the treasure which the dragon guards, but against his will and to his own great injury, by thus allowing himself (mythologically speaking) to be devoured by the monster and merged with it.

Identification with the collective psyche is therefore a failure; this way ends just as disastrously as did the first, which led to the severance of the persona from the collective psyche.

V.—LEADING PRINCIPLES FOR THE TREATMENT OF COLLECTIVE IDENTITY.

In order to solve the problem how practical treatment can overcome the assimilation of the collective psyche, we must first of all make quite clear to ourselves what was the error of the two ways already described. We saw that neither the one way nor the other led to any appropriate result. The first way simply leads the patient back to the point of departure, having lost the vital values contained in the collective psyche. The second way leads him straight into the collective psyche, having lost that detached human existence which alone renders possible a bearable and satisfying life. There are on both sides values that should not be lost to the individual.

The mistake is, therefore, neither in the collective psyche nor in the individual psyche, *but in allowing the one to exclude the other*. The monistic tendency assists this propensity, for it always suspects and looks for *one* principle everywhere. As a general psychological tendency, monism is a peculiarity of differentiated feeling and thought, corresponding to the keen desire to make the one or the other function the supreme psychological principle. The introversion type only knows the thought principle, and the extroversion type only that of feeling. This psychological monism—or it would be better to say monotheism—has the advantage of simplicity, and the disadvantage of one-sidedness. On the one hand, it signifies the exclusion of the variety and true riches of life; whilst on the other, it means the practicability of realizing the ideals of the present day and of the near past. But it does not in itself signify any actual possibility of human progress.

In the same way *rationalism* tends towards exclusiveness. Its essence is to exclude instantly whatever is opposed to its standpoint, whether it be intellectually logical or emotionally so. In regard to reason it is both monistic and autocratic. Special thanks are due to Bergson for having broken a lance for the right of the irrational to exist. Psychology will probably be obliged to acknowledge and to submit to a plurality of principles, in spite of the fact that this does not suit the scientific mind. Only so can psychology be saved from ship-wreck.

But with regard to individual psychology science must waive its claims. For to speak of a scientific individual psychology is in itself a *contradictio in adjecto*. It is necessarily always only the collective part of an individual psychology that can be the subject of scientific study, for the individual is—according to definition—something unique and incomparable. A "scientific" individual psychology is a denial of individual psychology. It may justly be suspected that individual psychology is indeed a projection of the psychology of him who defines it. Every individual psychology must have its own text-book, for the universal text-book only contains collective psychology.

These remarks are intended to prepare for what has to be said about the treatment of the aforesaid problem. The fundamental error of both the afore-mentioned ways is simply that the subject is collectively identified with the one or the other part of his psychology. His psychology is individual as well as collective, but not in such a manner as to merge the individual with what is collective, or the collective with what is individual. The persona must be strictly separated from the concept of the individual, in so far as the persona can be absolutely merged with the collective. But what is individual is just that which can never be absorbed in the collective, and is, too, never identical with the collective. Therefore, an identification with the collective or an arbitrary cutting-off from the collective is equivalent to illness; it is pathological.

As has already been indicated, what is individual appears at first as the particular selection of those elements of the collective psyche that contribute to the composition of the persona. As I said before, the components are not individual but collective. It is only their combination, or the selection as a model of particular groups that had already been combined, which is individual. That would be the individual nucleus which is concealed by the personal mask. By the particular differentiation of the persona, the resistance is shown of the individuality to the collective psyche. By analysing the persona, we transfer a greater value to the individuality, increasing thereby its conflict with collectivity. This conflict obviously is a psychological conflict in the individual. The dissolution of the compromise between the two halves of a pair of opposites increases the effectiveness of the contrast. This conflict does not exist within the sphere of purely unconscious natural life, although the purely physiological life of the individual also has to comply with collective demands.

The natural unconscious attitude is harmonious; the body, with its capacities and needs, providing immediately indications and limitations, that prevent intemperance and lack of proportion. A differentiated psychological function, however, always inclines towards disproportion, on account of the one-sidedness which is cultivated by the conscious rationality of intention. What is called mental individuality, is, also, an expression of the individual corporeity, being, so to speak, identical with it. This sentence might obviously also be reversed, a fact that does not materially alter the real psychological data concerning the intimate relation of the individuality to the body. At the same time, the body is also that which makes the subject resemble all others to a great extent, although it is the individual body that is differentiated from all others.

Similarly the mental or moral individuality differs from all others, although in every respect it is so constituted as to place one person on an equality with all others. Every living creature that is able freely to develop itself individually without any coercion at all, will, through the

perfecting of its individuality, soonest realize the ideal type of its species, and therefore, figuratively speaking, will have collective validity.

The persona is always identical with a *typical* attitude, in which *one* psychological function dominates, *e.g.* feeling, or thought, or intuition. This one-sidedness always causes the relative repression of the other functions. In consequence of this circumstance, the persona is hindering to the development of the individual. The dissolution of the persona is, therefore, an indispensable condition of individuation. It is, therefore, to some extent impossible to achieve individuation by means of conscious intention; for conscious intention leads to a conscious attitude, which excludes everything that "does not suit." But the assimilation of the unconscious contents leads, on the contrary, to a condition in which conscious intention is excluded, being replaced by a process of development that appears to us irrational. This process alone signifies individuation, its *product* being individuality as defined above, *viz.* as something individual that is at the same time universal. So long as the persona exists individuality is repressed, betraying itself at most by the particular selection of personal requisites, of what might be called the actor's costumes. Only when the unconscious is assimilated does the individuality become more prominent, and with it also that uniting psychological phenomenon between the ego and non-ego, expressed by the word *attitude*, is now no longer a typical attitude but an individual one.

What is paradoxical in these formulations arises from the same cause from which the conflict about the "universalia" formerly arose. The phrase "animal nullumque animal genus est" makes the fundamental paradox clearly comprehensible. What exists "really" is individual: that which is universal is existing psychologically, but being caused by the real-existing similarities of individual things. The individual is, therefore, the individual thing that has, to a greater or less extent, those attributes upon which the collective conception of "collectivity" rests; and the more individual he is, the more he develops those attributes that are the basis of a collective concept of human nature.

If a grotesque figure, suggested by the initial situation of our problem be permitted, it is Buridan's ass between the two bundles of hay. His questioning is obviously wrong: the question is not whether the hay-bundle on the right or the left be the better one, or whether he should begin to eat on the right or the left hand, *but what he himself would like to do, what he is eager for*—that is the point. He is thinking of the hay and not of himself, and therefore he does not know what he really wants.

The question is: what at this moment is the natural direction of the growth of this individual?

This question cannot be settled by any philosophy, religion or good advice, but solely by an unprejudiced review of the psychological germs of life which have resulted from the natural co-operation of the conscious and unconscious on the one hand, and of the individual and the collective on the other. One person looks for them in the conscious, and another in the unconscious. But the conscious is only one side, and the unconscious is only the other. For it should never be forgotten that dreams are compensatory or complementary to consciousness. Were this not the case, we should be obliged to regard dreams as a source of knowledge superior to the conscious. This view would undoubtedly carry us back to the mentality of the augur, and we should have to accept all the consequences of such a superstitious attitude, unless, indeed, we look upon dreams as valueless, as does the vulgar mind.

We find the *unifying function* that we are seeking, *in the phantasies* in which everything that has any effectual determination is present. But phantasies have a bad reputation among psychologists. The psychoanalytical theories hitherto obtaining have treated them accordingly. For both Freud and Adler the phantasy is nothing but a so-called "symbolic" disguise of what both investigators suppose to be the primary propensities and aims. But in opposition to these views it should be emphasised—not for theoretical but for essentially practical reasons—that the phantasy may indeed be thus causally explained and depreciated, but that it nevertheless is the creative soil for everything that has ever brought development to humanity. The phantasy as a psychological function has a peculiar non-reducible value of its own, whose roots are in both the conscious and the unconscious contents, and in what is collective as well as in what is individual.

But whence comes the bad reputation of the phantasy? It owes that reputation chiefly to the circumstance that it ought not to be taken literally. It is worthless if understood concretistically. If we understand semiotically, as Freud does, it is interesting from the scientific standpoint. But if it be understood *hermeneutically, as an actual symbol*, it provides us with the cue that we need in order to develop our life in harmony with ourselves.

For the significance of a symbol is not that it is a disguised indication of something that is generally known,^[255] but that it is an endeavour to elucidate by analogy what is as yet completely unknown and only in process of formation.^[256] The phantasy represents to us that which is just developing under the form of a more or less apposite analogy. By analytical reduction to something universally known, we destroy the actual value of the symbol; but it is appropriate to its value and meaning to give it an hermeneutical interpretation.

The essence of hermeneutics—an art that was formerly much practised—consists in adding more analogies to that already given by the symbol: in the first place, subjective analogies given by the patient as they occur to him; and in the second place, objective analogies provided by the analyst out of his general knowledge. The initial symbol is much enlarged and enriched by this procedure, the result being a highly complex and many-sided picture, which may now be reduced to *tertia comparationis*. Thence result certain psychological lines of development of an individual as well as collective nature. No science upon earth could prove the accuracy of these lines; on the contrary, rationalism could very easily prove that they are wrong. But these lines vindicate their validity by their *value for life*. The chief thing in practical treatment is that people should get a hold of their own life, not that the principle of their life should be provable or "right."

Of course, true to the spirit of scientific superstition *suggestion* will be mooted. But it should long ago have been realised that a suggestion is only accepted by one it suits. Beyond that there is no suggestion, otherwise the treatment of neurosis would be extremely simple, for we should only need to suggest health. This pseudo-scientific talk about suggestion is based upon the unconscious superstition that suggestion actually possesses some real magic power. No one succumbs to suggestion unless from the very bottom of his heart he be willing to co-operate.

By means of the hermeneutical treatment of the phantasies we arrive at the synthesis of the individual with the collective psyche, put theoretically, that is, but practically, one indispensable condition is yet lacking. For it belongs to the regressive disposition of the

neurotic—a disposition in which he has been confirmed in the course of his illness—to take neither himself nor the world seriously, but always to rely on this or that method or circumstance to effect a cure, quite apart from his own serious co-operation. "But you can't wash the dog without getting his skin wet." No cure can be effected without unlimited willingness and absolute seriousness on the part of the patient. There are no magical cures for neurosis. Just as soon as we begin to elaborate the symbolic outlines of the path, the patient must begin to walk thereon. If he delude himself and shirk it, no cure can result. He must really work and live according to what he has seen and recognised as the direction for the time being of his individual life-line, and must continue thereon until a distinct reaction of his unconscious shows him that he is beginning in good faith to go a wrong way.

He who does not possess this moral function of faithfulness to himself will never get rid of his neurosis; but he who has this faithfulness can find the way out.

Neither physician nor patient must yield to the delusion that "being analysed" is in itself sufficient to remove a neurosis. That would be deception and self-delusion. Ultimately it is infallibly the moral factor that decides between health and illness.

By the construction of the individual's life-line the ever-varying trends and tendencies of his libido are made conscious. These life-lines are not identical with the "directing fictions" discovered by Adler, which are none other than arbitrary attempts to cut the persona off from the collective psyche, and to give it independence. It might rather be said that the "directing fiction" is an unsuccessful attempt to construct a life-line. The unsuitability of the "directing fiction" is also proved by the fact that the lines are tenaciously retained for much too long a time. The hermeneutically constructed life-line is short, for life follows no straight lines that indicate the future long beforehand, for, as Nietzsche says, "All truth is crooked." Life-lines are therefore neither principles nor ideals of universal validity, but points of view and adaptations of ephemeral validity. An abatement of vital intensity, a perceptible loss of libido, or an excessive passion or ecstasy—all show that one such line is left, and that a new line begins, or rather should begin. Sometimes it is enough to leave the revealing of the new line to the unconscious; but this course should indeed not be recommended to the neurotic under all circumstances, though there are cases where what is needed is to learn to trust to so-called chance. However, it is not advisable to let one's self drift for any length of time; a watchful eye should at least be kept upon the reactions of the unconscious, that is to say, upon the dreams: these indicate like a barometer the one-sidedness of our attitude.^[257] Therefore, I consider it necessary, in contrast to some other analysts, for the patient after analysis to remain in contact with the unconscious, if he would avoid a relapse. That is why I am convinced that the real end of analysis is reached when the patient has acquired adequate knowledge of the method to remain in contact with the unconscious, and sufficient psychological knowledge to be able to understand approximately his ever-changing life-line; otherwise he is not in a position to follow the direction of the libido currents in the unconscious, and thereby to gain conscious support in the development of his individuality. Every serious case of neurosis needs this weapon in order to maintain the cure.

In this sense analysis is not a method that is a medical monopoly, but rather an art or technique or science of psychological life, which he who has been cured must continue to foster, for the sake of his own welfare and that of his environment. If he understands this aright he will not pose as a psychoanalytical prophet nor as a public reformer, but truly

understanding the common weal, he will first himself reap the benefit of the self-knowledge acquired in his treatment, and then he will let the example of his life work what good it can, rather than indulge in aggressive talk and missionary propaganda.

SUMMARY.

A. *Psychological Material must be divided into CONSCIOUS and UNCONSCIOUS Contents.*

1. The *conscious contents* are partly *personal*, in so far as their universal validity is not recognised; and partly *impersonal*, that is, collective, in so far as their universal validity is recognised.

2. The *unconscious contents* are partly *personal*, in so far as they concern solely repressed materials of a personal nature, that have once been relatively conscious and whose universal validity is therefore not recognised when they are made conscious; partly *impersonal*, in so far as the materials concerned are recognised as *impersonal* and of purely universal validity, of whose earlier even relative consciousness we have no means of proof.

B. *The Composition of the Persona.*

1. The conscious personal contents constitute the conscious personality, the conscious ego.

2. The unconscious personal contents constitute the *self*, the unconscious or subconscious ego.

3. The conscious and unconscious contents of a personal nature constitute the persona.

C. *The Composition of the Collective Psyche.*

1. The conscious and unconscious contents of an *impersonal* or collective nature compose the psychological *non-ego*, the *image of the object*. These materials can appear analytically as projections of feeling or of opinion, but they are *a priori* collectively identical with the object-*imago*, that is they appear as qualities of the object, and are only *a posteriori* recognised as subjective psychological qualities.

2. The persona is that grouping of conscious and unconscious contents which is opposed as ego to the non-ego. The general comparison of personal contents of different individuals establishes their far-reaching similarity, extending even to identity, by which the *individual* nature of personal contents, and therewith of the persona, is for the most part suspended. To this extent the persona must be considered an excerpt of the collective psyche, and also a component of the collective psyche.

3. The collective psyche is therefore composed of the object-*imago* and the persona.

D. *What is Individual.*

1. What is individual appears partly as the principle that decides the selection and limitation of the contents that are accepted as personal.

2. What is individual is the principle by which an increasing differentiation from the collective psyche is made possible and enforced.
3. What is individual manifests itself partly as an impediment to collective accomplishment, and as a resistance against collective thinking and feeling.
4. What is individual is the uniqueness of the combination of universal (collective) psychological elements.

E. *We must divide the Conscious and Unconscious Contents into Individualistic and Collectivistic.*

1. A content is individualistic whose developing tendency is directed towards the differentiation from the collective.
 2. A content is collectivistic whose developing tendency aims at universal validity.
 3. There are insufficient criteria by which to designate a given content as simply individual or collective, for uniqueness is very difficult to prove, although it is a perpetually and universally recurrent phenomenon.
 4. The life-line of an individual is the resultant of the individualistic and collectivistic tendency of the psychological process at any given moment.
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THE END

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FOOTNOTES:

- [1] Thesis published in 1902. Translator, M. D. Eder, M.D.
- [2] *Arch. f. Psych.*, XXXIII. p. 928.
- [3] Richer, "Études cliniques sur l'hystéro-épilepsie," p. 483.
- [4] *Idem, l.c.*, p. 487; cp. also Erler, *Allg. Zeitschrift f. Psychiatrie*, XXXV. p. 28; also Culerre, *Allg. Zeit. f. Psych.*, XLVI., Litteraturbericht 356.
- [5] Charcot and Guinon, "Progrès méd.," 1891.
- [6] "Somnambulism must be conceived as systematised partial waking, in which a limited, connected presentation-complex takes place. Contrary presentations do not occur, at the same time the mental activity is carried on with increased energy within the limited sphere of the waking" (Lowenfeld, "Hypnotism," 1901, p. 289).
- [7] Azam, "Hypnotisme—Double conscience," etc., Paris, 1887. For similar cases, cf. Forbes Winslow, "On Obscure Diseases," p. 335.
- [8] *Trib. méd.*, March, 1890.
- [9] *Annal. méd. psychol.*, Jan., Feb., 1892.
- [10] "Principles of Psychology," p. 391.
- [11] Mesnet, "De l'automatisme de la mémoire et du souvenir dans le somnambulisme pathologique." *Union médicale*, Juillet, 1874. Cf. Binet, "Les Altérations de la personnalité," p. 37. Cf. also Mesnet, "Somnambulisme spontané dans ses rapports avec l'hystérie," *Arch. de Neurol.*, Nr. 69, 1892.
- [12] *Arch. de Neur.*, Mai, 1891.
- [13] "Philosophy of Sleep," 1830. Cf. Binet, "Les Altérations," etc.
- [14] Goethe: *Zur Naturwissenschaft in Allgemeinen*. "I was able, when I closed my eyes and bent my head, to conjure the imaginary picture of a flower. This flower did not retain its first shape for a single instant, but unfolded out of itself new flowers composed of coloured petals and green leaves. They were not natural flowers, but phantastic ones. They were as regular in shape as a sculptor's rosettes. It was impossible to fix the creation which sprang up, nevertheless the dream-image lasted as long as I desired it to last; it neither faded nor grew stronger."

- [15] C. Westphal, "Die Agoraphobie," *Arch. f. Psych.*, III. p. 158.
- [16] Pick, *Arch. f. Psych.*, XV. p. 202.
- [17] *Allgem. Zeitschr. f. Psych.*, XXI. p. 78.
- [18] "Neurasthenische Krisen," *Münch. Med. Wochenschr.*, März, 1902, "When the patients first describe their crises they generally give a picture that makes us think of epileptic depression. I have often been deceived in this way."
- [19] Mörchen, "Ueber Dämmerzustände," Marburg, 1901, Fall. 32, p. 75.
- [20] It must be noted that a frequent guest in S. W.'s home was a gentleman who spoke high German.
- [21] Ivenes is the mystical name of the medium's somnambulatory self.
- [22] "The Major Symptoms of Hysteria." New York: The Macmillan Company.
- [23] See page 17.
- [24] Binet, "Les altérations de la personnalité."
- [25] Richet, *Rev. Phil.*, 1884, II. p. 650.
- [26] Binet, "Les altérations de la personnalité," p. 139.
- [27] Complete references in Binet, "Les altérations," p. 197, footnote.
- [28] As is known, during the waking-state the hands and arms are never quite still, but are constantly subjected to fine tremors. Preyer, Lehmann, and others have proved that these movements are influenced in a high degree by the predominant presentations. Preyer shows that the outstretched hand drew small, more or less faithful, copies of figures which were vividly presented. These purposeful tremors can be demonstrated in a very simple way by experiments with the pendulum.
- [29] Cf. Preyer, "Die Erklärung des Gedankenlesens," Leipzig, 1886.
- [30] Analogous to certain hypnotic experiments in the waking state. Cf. Janet's experiment when by a whispered suggestion he induced a patient to lie flat on the ground without being aware of it ("L'Automatisme").
- [31] Charcot's scheme of word-picture combination: 1, Auditory image. 2, Visual image. 3, Motor image., Speech image., Writing image. In Gilbert Ballet, "Die innerliche Sprache," Leipzig and Wien, 1890.
- [32] Bain says, "Thought is a suppressed word or a suppressed act" ("The Senses and the Intellect").
- [33] *Proceedings of S.P.R.*, 1885. "Automatic writing."
- [34] Pierre Janet, "L'Automatisme Psychologique," p. 317, Paris, 1889.
- [35] "Les Altérations," p. 132.
- [36] "Une fois baptisé, le personnage inconscient est plus déterminé et plus net, il montre mieux ses caractères psychologiques" (Janet, "L'Automatisme," p. 318).
- [37] Cf. the corresponding experiments of Binet and Féré. See Binet, "Les Altérations."

[38] Cf. Corresponding tests by Flournoy: "Des Indes à la planète Mara. Etude sur un cas de somnambulisme avec glossolalie." Paris and Genève, 1900.

[39] Cf. Hagen, "Zur Theorie des Hallucinationen," *Allg. Zeitschrift f. Psych.*, XXV. 10.

[40] Binet, "Les Altérations," p. 157.

[41] "Die Traumdeutung," 1900. ["The Interpretation of Dreams," translated by Dr. A. A. Brill. London: Allen & Unwin, 1918.]

[42] Flournoy, *l.c.*, p. 55.

[43] Schüle, "Handbuch," p. 134.

[44] J. Müller, quoted *Allg. Zeit. f. Psych.*, XXV. 41.

[45] Spinoza hypnopompically saw a "*nigrum et scabiosum Brasilianum*."—J. Müller, *l.c.*

In Goethe's "The Elective Affinities," at times in the half darkness Otilie saw the figure of Edward in a dimly-lit spot. Compare also Cardanus, "imagines videbam ab imo lecti, quasi e parvulis annulis arcisque constantes, arborum, belluarum, hominum, oppidorum, instructarum acierum, bellicorum et musicorum instrumentorum aliorumque huius generis adscendentes, vicissimque descendentes, aliis atque aliis succedentibus" (Hieronymus Cardanus, "De subtilitate rerum").

[46] "Le sommeil et les rêves," p. 134.

[47] G. Trumbull Ladd, "Contribution to the Psychology of Visual Dreams," *Mind*, April, 1892.

[48] Hecker says of the same condition, "There is a simple elemental vision, even without sense presentation, through over-excitation of mental activity, not leading to phantastic imagery, that is the vision of light free from form, a manifestation of the visual organs stimulated from within" ("Ueber Visionen," Berlin, 1848).

[49] Jules Quicherat, "Procès de condamnation et de réhabilitation de Jeanne d'Arc, dite La Pucelle," etc.

[50] Hagen, *l.c.*, p. 57.

[51] Goethe, "Benvenuto Cellini."

[52] Flournoy, *l.c.*, p. 32 ff.

[53] Flournoy, *l.c.*, p. 51.

[54] *Allg. Zeit. f. Psych.*, IV. 139.

[55] *Ibid.*, VI. 285.

[56] Coll. Physicians of Philadelphia, April 4, 1888. Also *Harper's Magazine*, 1869. Abstracted in extenso in William James's "Principles of Psychology," 1891, p. 391 ff.

[57] Cf. Emminghaus, "Allg. Psychopathologie," p. 129, Ogier Ward's case.

[58] Schroeder von der Kalk, "Pathologie und Therapie der Geisteskrankheiten," p. 31: Braunschweig, 1863. Quoted in *Allg. Zeit. f. Psych.*, XXII., p. 405.

- [59] Cf. Donath, "Ueber Suggestibilität," Wiener mediz. Presse, 1832, No. 31. Quoted *Arch. f. Psych.*, XXXII., p. 335.
- [60] Hoefelt. *Allg. Zeit. f. Psych.*, XLIX., p. 200.
- [61] Azam, "Hypnotisme, Double Conscience," etc.
- [62] Bourru et Burot, "Changements de Personnnalité," 1888.
- [63] Moll, "Zeit. f. Hypn.," I., 306.
- [64] Rieger, "Der Hypnotismus," 1884, p. 190 ff.
- [65] Morton Prince, "An Experimental Study of Visions," *Brain*, 1898.
- [66] Quoted by Ribot, "Die Persönlichkeit."
- [67] *Ibid.*, p. 69.
- [68] Flournoy, *l.c.*, p. 59.
- [69] "Les rêves somnambuliques, sortes de romans de l'imagination subliminale, analogues à ces histoires continues, que tant de gens se racontent à eux-mêmes et dont ils sont généralement les héros dans leurs moments de far niente ou d'occupations routinières qui n'offrent qu'un faible obstacle aux rêveries intérieures. Constructions fantaisistes, millefois reprises et poursuivies, rarement achevées, où la folle du logis se donne libre carrière et prend sa revanche du terne et plat terre à terre des réalités quotidiennes." (Flournoy, *l.c.*, p. 8).
- [70] Delbruck, "Die Pathologische Lüge."
- [71] Forel, "Hypnotisme."
- [72] Pick, "Ueber Path. Träumerei und ihre Beziehung zur Hysterie," *Jahr. f. Psych. und Neur.*, XIV., p. 280.
- [73] Bohn, "Ein Fall von doppelten Bewusstsein Diss." Breslau, 1898.
- [74] Görres, *l.c.*
- [75] Cf. Behr, *Allg. Zeit. f. Psych.*, LVI., 918, and Ballet, *l.c.*, p. 44.
- [76] Cf. Redlich, *Allg. Zeit. f. Psych.*, LVII., 66.
- [77] Erler, *Allg. Zeit. f. Psych.*, XXXV., 21.
- [78] Binet, "Les hystériques ne sont pas pour nous que des sujets d'élection agrandissant des phénomènes qu'on doit nécessairement retrouver à quelque degré chez une foule d'autres personnes qui ne sont ni atteintes ni même effleurées par la névrose hystérique". ("Les altérations," p. 29)
- [79] Delbrück, *l.c.*, and Redlich, *l.c.* Cf. the development of delusions in epileptic stupor mentioned by Mörchen, "Essay on Stupor," pp. 51 and 59, 1901.
- [80] Cf. Flournoy's very interesting supposition as to the origin of the Hindu *cycle* of H.S.: "Je ne serais pas étonné que la remarque de Martes sur la beauté des femmes du Kanara ait été le clou, l'atome crochu, qui a piqué l'attention subliminale et l'a très naturellement rivée sur cette unique passage avec les deux ou trois lignes consécutives, à l'exclusion de tout le contexte environnant beaucoup moins intéressant" (*L.c.*, p. 285).

[81] Janet says, "From forgetfulness there arises frequently, even if not invariably, the so-called lying of hysteria. The same explanation holds good of a hysteric's whims, changes of mood, ingratitude—in a word, of his inconstancy. The link between the past and present, which gives to the whole personality its seriousness and poise, depends to a large extent upon memory" ("Mental States," etc., p. 67).

[82] Freud, "The Interpretation of Dreams," p. 469.

[83] Binet, *l.c.*, p. 84.

[84] "Une autre considération rapproche encore ces deux états, c'est que les actes subconscients ont un effet en quelque sorte hypnotisant et contribuant par eux-mêmes à amener le somnambulisme" ("L'Automatisme," p. 329).

[85] Janet, *l.c.*, p. 329.

[86] In literature Gustave Flaubert has made use of a similar falling asleep at the moment of extreme excitement in his novel "Salambo." When the hero, after many struggles, has at last captured Salambo, he suddenly falls asleep just as he touches her virginal bosom.

[87] Perhaps the cases of paralysis of the emotions also belong here. Cf. Baetz, *Allg. Zeitsch. f. Psych.*, LVIII., p. 717.

[88] *Allg. Zeitsch. f. Psych.*, XXX., p. 17.

[89] *Arch. f. Psych.*, XXIII., p. 59.

[90] Cf. here Flournoy, *l.c.*, 65.

[91] *Arch. f. Psych.*, XXII., p. 737.

[92] *Ibid.*, 734.

[93] Bonamaison, "Un cas remarquable d'Hypnose spontanée," etc.—*Rev. de l'Hypnotisme*, Fév. 1890, p. 234.

[94] *Arch. f. Psych.*, XXII., 737.

[95] *Ibid.*

[96] *Ibid.*, XXIII., p. 59 ff.

[97] Cf. Lehman's investigations of involuntary whispering, "Aberglaube und Zauberei," 1898, p. 385 ff.

[98] Thus Flournoy writes, "Dans un premier essai Léopold (H.S.'s control-spirit) ne réussit qu'à donner ses intimations et sa prononciation à Helen: après une séance où elle avait vivement souffert dans la bouche et le cou comme si on lui travaillait ou lui enlevait les organes vocaux, elle se mit à causer très naturellement."

[99] Loewenfeld, *Arch. f. Psych.*, XXIII., 60.

[100] This behaviour recalls Flournoy's observations: "Whilst H.S. as a somnambule speaks as Marie Antoinette, the arms of H.S. do not belong to the somnambulant personality, but to the automatism Leopold, who converses by gestures with the observer" (Flournoy, *l.c.*, p. 125).

[101] Dessoir, "Das Doppel-Ich," II. Aufl., 1896, p. 29.

[102] Janet, "L'anesthésie hystérique," *Arch. d'Neur.*, 69, 1892.

[103] Graeter, *Zeit. f. Hypnotismus*, VIII., p. 129.

[104] The hysterical attack is not a purely psychological process. By the psychological processes only a pre-formed mechanism is set free, which has nothing to do with psychological processes in and for themselves (Karplus, *Jahr. f. Psych.*, XVII.).

[105] Carl Hauptmann, in his drama "Die Bergschmiede," has made use of the objectivation of certain linked association-complexes. In this play the treasure-seeker is met on a gloomy night by a hallucination of his entire better self.

[106] Freud, "The Interpretation of Dreams." See also Breuer and Freud's "Studies on Hysteria," 1895.

[107] Pelman, *Allg. Zeit. f. Psych.*, XXI., p. 74.

[108] *Allg. Zeit. f. Psych.*, XXII., p. 407.

[109] Flournoy, *l.c.*, p. 28.

[110] Binet, "Les Altérations," p. 125. Cf. also Loewenfeld's statements on the subject in "Hypnotismus," 1901.

[111] *Cryptomnesia* must not be regarded as synonymous with *Hypermnnesia*; by the latter term is meant the abnormal quickening of the power of recollection which reproduces the memory-pictures as such.

[112] "Has any one at the end of the nineteenth century any clear conception of what the poets in vigorous ages called inspiration? If not, I will describe it. The slight remnant of superstition by itself would scarcely have sufficed to reject the idea of being merely incarnation, merely mouthpiece, merely the medium of superior forces. The concept revelation in the sense that quite suddenly, with ineffable certainty and delicacy, something is seen, something is heard, something convulsing and breaking into one's inmost self, does but describe the fact. You hear—you do not seek; you accept—asking not who is the giver. Like lightning, flashes the thought, compelling without hesitation as to form—I have had no choice" (Nietzsche's "Works," vol. III., p. 482.).

[113] "There is an ecstasy so great that the immense strain of it is sometimes relaxed by a flood of tears, during which one's steps now involuntarily rush, and anon involuntarily lag. There is the feeling that one is utterly out of hand, with the very distinct consciousness of an endless number of fine thrills and titillations descending to one's very toes;—there is a depth of happiness in which the most painful and gloomy parts do not act as antitheses to the rest, but are produced and required as necessary shades of colour in such an overflow of light" (Nietzsche, "Ecce Homo," vol. XVII. of English translation, by A. M. Ludovici, p. 103).

[114] Eckermann, "Conversations with Goethe," vol. III.

[115] Cf. Goerres, "Die christliche Mystik."

[116] Bresler, "Kulturhistorischer Beitrag zur Hysterie," *Allg. Zeits. f. Psych.* LIII., p. 333.

[117] Zündel, "Biographie Blumhardt's."

[118] "Le baragouin rapide et confus dont on ne peut jamais obtenir la signification, probablement parce qu'il n'en a en effet aucune, n'est qu'un pseudo-

langage (p. 193) analogue au baragouinage par lequel les enfants se donnent parfois dans leurs jeux l'illusion qu'ils parlent chinois, indien ou 'sauvage'" (p. 152, Flournoy, *l.c.*).

[119] See p. 63.

[120] Flournoy, *l.c.*, p. 378.

[121] For a case of this kind see Krafft Ebing, "Lehrbuch," 4th edition, p. 578.

[122] The limitation of the associative processes and the concentration of attention upon a definite sphere of presentation can also lead to the development of new ideas, which no effort of will in the waking state would have been able to accomplish (Loewenfeld, "Hypnotismus," p. 289).

[123] Zschokke, "Eine Selbstschau," III., Aufl. Aarau, 1843, p. 227 ff.

[124] Gilles de la Tourette says, "We have seen somnambolic girls, poor, uneducated, quite stupid in the waking state, whose whole appearance altered so soon as they were sent to sleep. Whilst previously they were boring, now they are lively, alert, sometimes even witty" (Cf. Loewenfeld, *l.c.*, p. 132).

[125] Lectures delivered at the celebration of the twentieth anniversary of the opening of Clark University, September, 1909; translated from the German by Dr. A. A. Brill, of New York. Reprinted by kind permission of Dr. Stanley Hall.

[126] The selection of these stimulus words was naturally made for the German language only, and would probably have to be considerably changed for the English language.

[127] Denotes misunderstanding.

[128] Denotes repetition of the stimulus words.

[129] Denotes repetition of the stimulus words.

[130] + denotes Reproduced unchanged.

[131] Denotes misunderstanding.

[132] Denotes repetition of the stimulus words.

[133] Denotes misunderstanding.

[134] Denotes repetition of the stimulus words.

[135] Denotes repetition of the stimulus words.

[136] Denotes repetition of the stimulus words.

[137] Denotes repetition of the stimulus words.

[138] Denotes repetition of the stimulus words.

[139] Reaction times are always given in fifths of a second.

[140] "Studies in Word Association," in course of publication.

[141] "Jahrbuch für Psychoanalytische und Psychopathologische Forschungen," Band I. Deuticke, Wien, 1902.

[142] This lecture was originally published in the "Jahrbuch für Psychoanalytische und Psychopathologische Forschungen," Band II.

[143] "Jahrbuch für Psychoanalytische und Psychopathologische Forschungen," Band I. Deuticke, Wien, 1902.

[144] Jung: "The Psychology of Dementia Præcox," translated by Peterson and Brill. *Journal of Nervous and Mental Diseases*, Monograph Series, No. 3.

[145] This wish to sit up with the father and mother until late at night often plays a great part later in a neurosis.

[146] A doll from Punch and Judy.

[147] See analysis of a five-year-old boy, *Jahrbuch f. Psychoanalytische u. Psychopathologische Forschungen*, vol. I.

[148] Franz Riklin, "Fulfilment of Wishes and Symbolism in Fairy Tales."

[149] *Jahrbuch für Psychoanalytische und Psychopathologische Forschungen*, vol. I., 1909. Translator, Dr. M. D. Eder.

[150] Freud, especially "The Interpretation of Dreams."

[151] Libido is what earlier psychologists called "will" or "tendency." The Freudian expression is *denominatio a potiori*. *Jahrbuch*, vol. I., p. 155, 1909.

[152] Sommer, "Familienforschung und Vererbungslehre." Barth, Leipzig, 1907. Joerger, "Die Familie, Zero," *Arch. für Rassen u. Gesellschaftsbiologie*, 1905. M. Ziermer (pseudonym), "Genealogische Studien über die Vererbung geistiger Eigenschaften," *ibid.*, 1908.

[153] For the importance of the mother, see "The Psychology of the Unconscious." C. G. Jung. Moffart, Yard and Co., New York.

[154] E. Fürst, "Statistische Untersuchungen über Wortassoziationen und über familiäre Übereinstimmung im Reaktionstypus bei Ungebildeten. Beitrag der diagnostischen Assoziationsstudien herausgegeben von Dr. C. G. Jung," *Journal für Psychologie und Neurologie*, Bd. II., 1907. (Reprinted in volume two of the Joint Reports.)

[155] By this type I understand reactions where the response to the stimulus-word is a predicate subjectively accentuated instead of an objective relation, e.g., Flower, pleasant; frog, horrible; piano, terrible; salt, bad; singing, sweet; cooking, useful (see p. 124).

[156] Cf. Vigouroux et Jaqueliers, "La contagion mentale," Chapitre VI. Doin, Paris, 1905.

[157] Between whiles we believe ourselves masters of our acts at any given moment. But when we look back along our life's path and fix our eyes chiefly upon our unfortunate steps and their consequences, often we cannot understand how we came to do this and leave that undone, and it seems as if some power outside ourselves had directed our steps. Shakespeare says;

"Fate show thy force: ourselves we do not owe;
What is decreed must be, and be this so!"

Schopenhauer, "Ueber die anscheinende Absichtlichkeit im Schicksale des Einzelnen. Parerga und Paralipomena."

[158] This was seen in the Amsterdam Congress of 1907, where a prominent French savant assured us that the Freudian theory was but "une plaisanterie." This gentleman has demonstrably neither read Freud's latest works nor mine, he knows less about the subject than a little child. This opinion, so admirably grounded, ended with the applause of a well-known German professor. One can but bow before such thoroughness. At the same Congress another well-known German neurologist immortalised his name with the following intellectual reasoning: "If hysteria on Freud's conception does indeed rest on repressed affects, then the whole German army must be hysterical."

[159] Cf. Freud, "Zeitschrift für Religionspsychologie," 1907.

[160] *Journal of Abnormal Psychology*, vol. III., p. 219, 1908.

[161] "Zentralblatt für Psychoanalyse," 1911, vol. I., p. 81.

[162] Author's italics.

[163] This also holds good for any objects that are repeated.

[164] See "The Association Method," Lecture III.

[165] "Zentralblatt für Psychoanalyse," 1911, p. 567. Translator, Dr. M. D. Eder.

[166] The husband's principal conflict is a pronounced mother-complex.

[167] Flournoy, "Des Indes à la Planète Mars." Idem: "Nouvelles observations sur un cas de somnambulisme," *Arch. de Psychol.*, vol. I.

[168] See chapter I, p. 86.

[169] "Jahrbuch für psychoanalytische und psychopathologische Forschungen," vol. III. 1912. Translator, Dr. M. D. Eder.

[170] Autism (Bleuler) = Auto-erotism (Freud). For some time I have employed the concept of *introversion* for this condition.

[171] Hence the replacing of the complex by its corresponding symbol.

[172] See "Psychology of Dementia Præcox," chapters iv. and v.

[173] Reprinted from the *Transactions of the Psycho-Medical Society*, August 5th, 1913.

[174] See "Psychology of the Unconscious."

[175] Paper given before the 17th International Medical Congress, London, 1913.

[176] Translated by Mrs. Edith Eder.

[177] "Psychoanalysis." *Nervous and Mental Disease*, No. 19. Monograph series.

[178] See Author's preface to "The Psychology of Dementia Præcox."

[179] Thus a patient, who had been treated by a young colleague without very much result, once said to me: "Certainly I made great progress with him, and I am much better than I was. He tried to analyse my dreams. It's true he never understood them, but he took *so much trouble* over them. He is really a good doctor."

[180] Defined in the Freudian sense, as the transference to the doctor of infantile and sexual phantasies. A more advanced conception of the transference perceives

in it the important process of emotional approach [*Einfühlung*] which at first makes use of infantile and sexual analogies.

[181] "Selected Papers on Hysteria and other Psychoneuroses." *Monograph Series*, No. 4, last edition.

[182] Paper given before the Section of Neurology and Psychological Medicine, Aberdeen, 1914. Reprinted from the *British Medical Journal*, by kind permission of the Editor, Dr. Dawson Williams.

[183] Delivered at the Psychoanalytical Congress, Munich, 1913. Translated from *Archives de Psychologie*, by kind permission of the Editor, Dr. Claparède. Translator, C. E. Long.

[184] "The concept of energy is that which comes nearest to the concept of libido. Libido can perhaps be described as "effect," or "capacity for effect." It is capable of transformation from one form to another. The metamorphosis can be sudden, as when one function replaces another in a moment of danger; or it can be gradual, as we see it in the process of sublimation, where the libido is led over a long and difficult path through a variety of forms into a different function."—MARY MOLTZER.

[185] "Pragmatism," Chapter I.

[186] "Pragmatism," ch. i., p. 14.

[187] W. Ostwald "Grosse Männer," Leipzig, 1910 (11th Lecture, "Classics and Romanticists"). See also his contribution, "A propos de la Biologie du Savant," *Bibliothèque Universelle*, Oct., 1910.

[188] Nietzsche, "The Birth of Tragedy," trans. Wm. A. Haussmann.

[189] Finck, "Der deutsche Sprachbon als Aus druck, deutscher Weltanschauung." Marburg, 1899.

[190] Gross, "Die zerebrale Sekundärfunktion." Leipsig, 1902.

[191] Adler, "Über den nervösen Charakter." Wiesbaden, 1912.

[192] This lecture was prepared for the Berne Medical Congress, 1914, postponed on the outbreak of war. Translator, Dora Hecht.

[193] "The Psychology of the Unconscious" ("Wandlungen und Symbole der Libido"). Moffat, Yard & Co.

[194] First Edition, 1908 = Part I. (unaltered); Second Edition, 1914 = Part II. Translator, M. D. Eder.

[195] "The Psychology of Dementia Præcox," translated by Brill and Peterson, *Monograph Series of the Journal of Nervous and Mental Diseases*, New York.

[196] Bresler, "Kulturhistorischer Beitrag zur Hysterie." *Allg. Zeitschrift für Psychiatrie*, Bd. LIII., p. 333. Zündel, "Biographie Blumhardts."

[197] Central Asylum and University Psychiatric Clinic in Zürich.

[198] In psychiatry "inadequate" is employed to denote disproportion between feeling and idea whether in excess or the reverse.

[199] I am indebted for this example to my colleague Dr. Abraham of Berlin.

- [200] As one might say in England, "a Bond Street dressmaker."
- [201] This is an addition to the second edition, 1914.
- [202] "The Psychology of Dementia Præcox."
- [203] *Jahrbuch für psychoanalytische Forschung*, vol. III. pp. 9 and 558.
- [204] Comp. also Ferenczi: "Über die Rolle der Homosexualität in der Pathogenese der Paranoia," *Jahrb.*, III., p. 101.
- [205] Maeder: "Psychologische Untersuchungen an Dementia præcox Kranken," *Jahrbuch f. psychoanalyt. Forsch.*, II., p. 185.
- [206] Spielrein: "Über den psychologischen Inhalt eines Falles von Schizophrenie," *l.c.*, III., p. 329 ff.
- [207] Nelken: "Analytische Beobachtungen über Phantasien eines Schizophrenen," *l.c.*, IV., p. 505 ff.
- [208] Grebelskaja: "Psychologische Analyse eines Paranoiden," *l.c.*, IV., p. 116 ff.
- [209] Itten: "Beiträge zur Psychologie der Dementia præcox," *l.c.*, p. V., 1 ff.
- [210] Nietzsche, "Thus spake Zarathustra."
- [211] "Quelques faits d'imagination créatrice subconsciente," Miss Miller, vol. V., p. 36.
- [212] Here "objective" understanding is not identical with causal understanding.
- [213] This energy may also be designated as *hormé*. *Hormé* is a Greek word [Greek: *hormê*]—force, attack, press, impetuosity, violence, urgency, zeal. It is related to Bergson's "*élan vital*." The concept *hormé* is an energetic expression for psychological values.
- [214] See p. 287.
- [215] "Die zerebrale Sekundärfunktion." Leipzig, 1902.
- [216] New Edition, 1917. Translated by Miss Dora Hecht.
- [217] Bleuler, "Die Psychoanalyse Freuds." *Jahrbuch für psychoanalytische Forschungen*, vol. II., 1910.
- [218] Breuer and Freud, "Selected Papers on Hysteria and other Psychoneuroses." "Nervous and Mental Disease," Monograph series, No. 4.
- [219] Freud, "Sammlung kleiner Schriften zur Neurosenlehre." Deuticke: Wien.
- [220] Freud, "The Interpretation of Dreams," George Allen.
- [221] Freud, "Three Contributions to the Sexual Theory." Monograph Series.
- [222] Cp. Breuer and Freud, "Selected Papers on Hysteria."
- [223] Breuer and Freud, "Selected Papers on Hysteria and other Psychoneuroses."
- [224] For further particulars of this case see Jung, "The Theory of Psychoanalysis."
- [225] We may still apply to love the saying: "The heaven above, the heaven below, The sky above, the sky below, All things above, all things below, Succeed and

prosper" (Old Mystic). Mephistopheles expresses the idea when he describes himself as "Part of that power which still produceth good, whilst ever scheming ill."

[226] "Love" is used in that larger sense of the word, which indeed belongs to it by right; it does not mean "mere sexuality."

[227] Compare Jung, "Diagnostische Associationsstudien." Leipzig: J. A. Barth. 2 volumes.

[228] The theory of "Complexes" is set out in "Psychology of Dementia præcox," Jung.

[229] Freud, "The Interpretation of Dreams." James Allen.

[230] The rules of dream-analysis, the laws of the structure of the dream and its symbolism, form almost a science; this is one of the most important chapters of the psychology of the unconscious whose comprehension requires very arduous study.

[231] Compare Jung, "The Psychology of the Unconscious."

[232] Thus spake Zarathustra, p. 40.

[233] The German "Auslebetheorie."

[234] "Ueber den nervösen Charakter."

[235] For a preliminary communication upon the subject see page 287.

[236] "The Philosophy of Values."

[237] "Pragmatism."

[238] "Grosse Männer" ("Great Men").

[239] *Furneaux Jordan*: "Character as seen in Body and Parentage." London, 1896.

[240] I purposely describe only the two types here. Obviously, the possibility of the existence of other types is not thereby excluded. Other possibilities are known to us. I refrain from mentioning them, with a view to limiting the material.

[241] The *Monist*, vol. xvi. p. 363.

[242] The German name for crab (Krebs) is the same as that for cancer.

[243] A parallel conception of the two kinds of interpretation is found in a commendable book by *Silberer*: "Probleme der Mystik und ihrer Symbolik" ("Problems of Mysticism and their Symbolism").

[244] "Halb zog sie ihn, halb sank er hin," etc.

[245] I have also termed this procedure the "hermeneutic method." See page 468-9.

[246] "Das Zeitalter des Sonnengottes" ("The Age of the Sun-god").

[247] I have treated the parallels of hero-myths in great detail in "The Psychology of the Unconscious."

[248] "Denkwürdigkeiten eines Nervenkranken" ("Memoirs of a Neurasthenic Patient").

[249] Lecture given before the Zürich School for Analytical Psychology, 1916.

[250] In a certain sense the "likeness to God" is always *a priori* present even before analysis, not only in the neurotic, but also in the normal individual, with the difference only that the normal individual is effectively separated from the perception of the unconscious, whilst this separation becomes increasingly impossible to the neurotic. In consequence of his special sensitiveness, the neurotic is *a priori* more closely affected by the processes of the unconscious than is the normal person, wherefore the God-Almightiness becomes more distinct in him than in the normal individual. By means of the knowledge of the unconscious acquired through analysis the "God-likeness" is increased.

[251] Pp. 69 and 95.

[252] The collective mind represents collective thought, the collective soul represents collective feeling, and the *collective psyche* represents the general collective psychological function.

[253] I should here observe that I am intentionally refraining from discussing our problem from the standpoint of the psychology of types. A specialised and somewhat complicated investigation was necessary in order to discover formulations appropriate to the types. For instance, "person" means something totally different to the extrovert from what it does to the introvert. I must content myself here with pointing out the difficulties such a task would involve. In the types, the conscious and real adapted function in childhood is collective, but soon acquires a personal character, and may retain this to the end, unless the individual feels impelled to develop his type to the uttermost. If this happens, the conscious real adapted function attains a degree of perfection which may claim universal validity and therefore bears a collectivistic character, in contrast to its originally collective character. According to this mode of expression collective psyche would be identical with "herd soul" in the individual; but the collectivistic psychology would be a highly differentiated adaptation to society. For the introvert the conscious real adapted function is *thinking*, which in the lower stages of development is entirely personal, but has a tendency to acquire a universal character of a collectivistic kind; his feeling remains distinctly personal so far as it is conscious, and collective-archaic in so far as it has remained unconscious or is repressed. The opposite applies to the *feeling* and thought of the extrovert. The introvert is always concerned with the endeavour to preserve the integrity of his ego, which results in a different attitude towards his own person from that of the extrovert, whose adaptation is made through his feelings, even at the cost of his own person. These few sentences indicate into what an extraordinarily difficult situation we should have been led had we considered our problem from the standpoint of the types.

[254] "Psychology of the Unconscious."

[255] That is, of a universal primary propensity or a universal primal aim.

[256] Cp. *Silberer*: "Probleme der Mystic und ihrer Symbolik." Wien, 1914. ("Problems of Mysticism and its Symbolism.")

[257] It should be borne in mind that no moral function is to be sought in this conception of dreams, nor do I look for it there. This function is just as little "teleological" in the sense of a philosophical teleology, that is to say of a set aim or purpose. It is in the first place compensatory, because it presents a subliminal

picture of the actual situation. The phenomenon should first of all be understood from a purely causal standpoint. But it would be unjust to the essence of what is psychological if one were to consider it purely causally. For it does not only tolerate, but also demand, a final point of view. In other words, the question arises, what is the use of bringing just this material to constellation? This is not to assert that the final meaning of a phenomenon had already existed as an *a priori* given purpose in the preparatory stages of the phenomenon. It would not be permissible, according to the theory of cognition, to presuppose some pre-existing purpose from the unmistakable final meaning of biological mechanisms. But it would be narrow-minded if, with the justifiable omission of the teleological conclusion, one wished also to give up the point of view of finality. The utmost that can be said is, it is *as if* there were some pre-existing purpose present. In psychology one must be on one's guard against exclusive reliance either upon causality or upon teleology.

Transcriber notes:

[P.XXI](#). 'C. C.' changed to 'C. G.'

[P.22](#). 'Occasionlly' typo for 'Occasionally', changed.

[P.23](#). 'third kind of taste' changed 'taste' to 'state'.

[P.72](#). 'Our patent develops', 'patent' changed to 'patient'.

[P.103](#). added '+ denotes' in footnote 9 for multiple footnote.

[P.201](#). 'Pyschology' typo for 'Psychology', changed.

[P.217](#). 'unnecessary' typo for 'unnecessary', changed.

[P.305](#). 'casuality' typo for 'causality', changed.

[P.340](#). 'beween' typo for 'between', changed.

[P.345](#). Placed footnote anchor after 'mythological formations', but could be elsewhere on the page. It may be an independant reference to the whole section.

[P.384](#). 'castastrophe' typo for 'catastrophe', changed.

[P.451](#). 'colective' typo for 'collective', changed.

[P.471](#). 'devolopment' typo for 'development' changed.

[P.482](#). in index, 'Hommunculus' is 'Homunculus' in the book, changed.

Fixed various punctuation.

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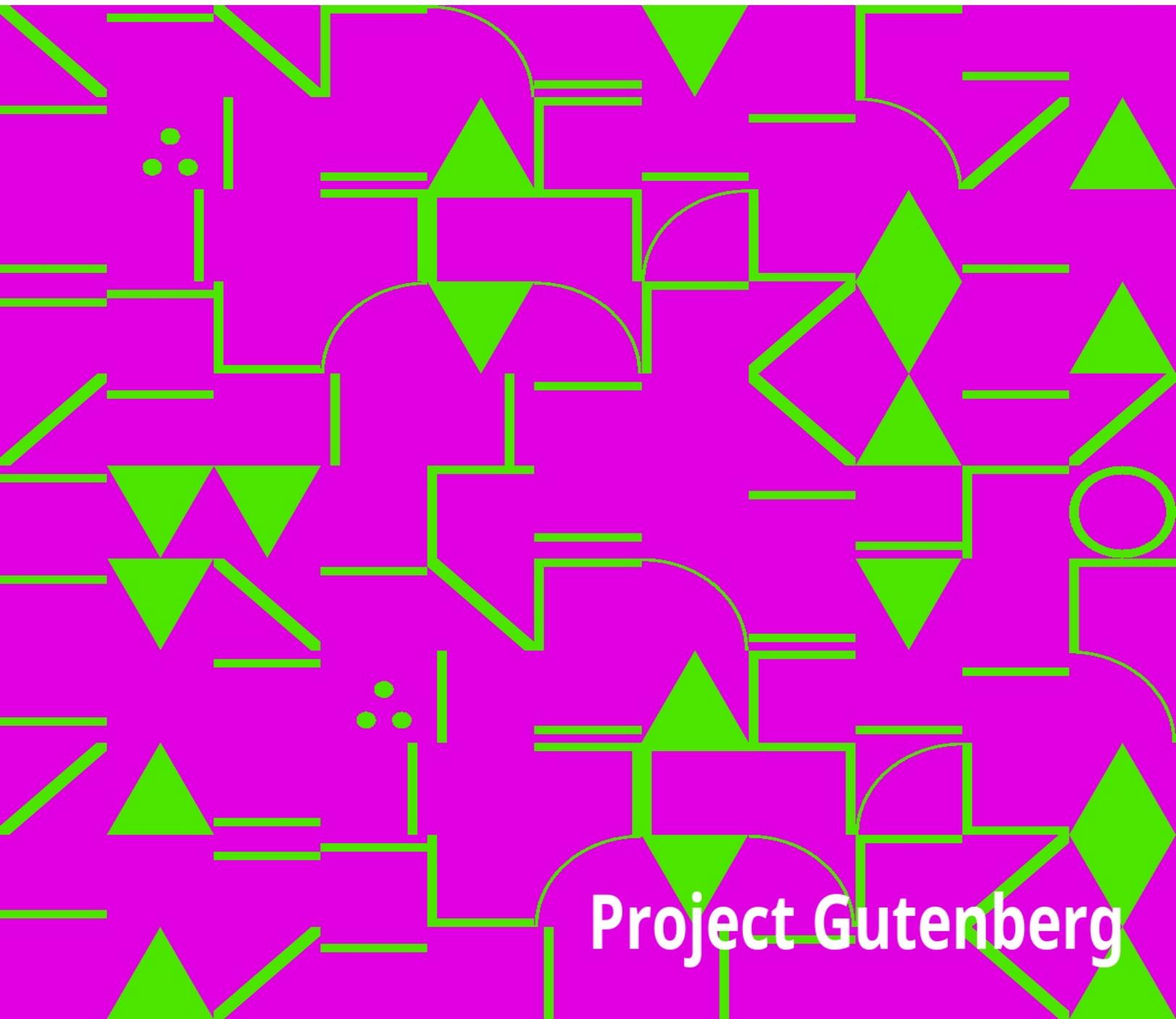
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Memoirs of Extraordinary Popular Delusions and the Madness of Crowds

Charles Mackay



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MEMOIRS

OF

EXTRAORDINARY POPULAR

DELUSIONS

AND THE

Madness of Crowds.

BY CHARLES MACKAY, LL.D.

AUTHOR OF "EGERIA," "THE SALAMANDRINE," ETC.

ILLUSTRATED WITH NUMEROUS ENGRAVINGS.

N'en déplaie à ces fous nommés sages de Grèce,
En ce monde il n'est point de parfaite sagesse;
Tous les hommes sont fous, et malgré tous leurs soins
Ne diffèrent entre eux que du plus ou du moins.

BOILEAU.

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THE MISSISSIPPI SCHEME: GARDENS OF THE HOTEL DE SOISSONS, 1720.

MEMOIRS
OF
EXTRAORDINARY POPULAR DELUSIONS.
VOLUME I.



THE BUBBLERS' ARMS—PROSPERITY.

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Preface.

IN reading the history of nations, we find that, like individuals, they have their whims and their peculiarities; their seasons of excitement and recklessness, when they care not what they do. We find that whole communities suddenly fix their minds upon one object, and go mad in its pursuit; that millions of people become simultaneously impressed with one delusion, and run after it, till their attention is caught by some new folly more captivating than the first. We see one nation suddenly seized, from its highest to its lowest members, with a fierce desire of military glory; another as suddenly becoming crazed upon a religious scruple; and neither of them recovering its senses until it has shed rivers of blood and sowed a harvest of groans and tears, to be reaped by its posterity. At an early age in the annals of Europe its population lost their wits about the sepulchre of Jesus, and crowded in frenzied multitudes to the Holy Land; another age went mad for fear of the devil, and offered up hundreds of thousands of victims to the delusion of witchcraft. At another time, the many became crazed on the subject of the philosopher's stone, and committed follies till then unheard of in the pursuit. It was once thought a venial offence, in very many countries of Europe, to destroy an enemy by slow poison. Persons who would have revolted at the idea of stabbing a man to the heart, drugged his pottage without scruple. Ladies of gentle birth and manners caught the contagion of murder, until poisoning, under their auspices, became quite fashionable. Some delusions, though notorious to all the world, have subsisted for ages, flourishing as widely among civilised and

polished nations as among the early barbarians with whom they originated,—that of duelling, for instance, and the belief in omens and divination of the future, which seem to defy the progress of knowledge to eradicate them entirely from the popular mind. Money, again, has often been a cause of the delusion of multitudes. Sober nations have all at once become desperate gamblers, and risked almost their existence upon the turn of a piece of paper. To trace the history of the most prominent of these delusions is the object of the present pages. Men, it has been well said, think in herds; it will be seen that they go mad in herds, while they only recover their senses slowly, and one by one.

Some of the subjects introduced may be familiar to the reader; but the Author hopes that sufficient novelty of detail will be found even in these, to render them acceptable, while they could not be wholly omitted in justice to the subject of which it was proposed to treat. The memoirs of the South-Sea madness and the Mississippi delusion are more complete and copious than are to be found elsewhere; and the same may be said of the history of the Witch Mania, which contains an account of its terrific progress in Germany, a part of the subject which has been left comparatively untouched by Sir Walter Scott in his *Letters on Demonology and Witchcraft*, the most important that have yet appeared on this fearful but most interesting subject.

Popular delusions began so early, spread so widely, and have lasted so long, that instead of two or three volumes, fifty would scarcely suffice to detail their history. The present may be considered more of a miscellany of delusions than a history—a chapter only in the great and awful book of human folly which yet remains to be

written, and which Porson once jestingly said he would write in five hundred volumes! Interspersed are sketches of some lighter matters, —amusing instances of the imitateness and wrongheadedness of the people, rather than examples of folly and delusion.

Religious matters have been purposely excluded as incompatible with the limits prescribed to the present work; a mere list of them would alone be sufficient to occupy a volume.



JOHN LAW.

MONEY MANIA.—THE MISSISSIPPI SCHEME.

Some in clandestine companies combine;
Erect new stocks to trade beyond the line;
With air and empty names beguile the town,
And raise new credits first, then cry 'em down;
Divide the empty nothing into shares,
And set the crowd together by the ears.—*Defoe.*

THE personal character and career of one man are so intimately connected with the great scheme of the years 1719 and 1720, that a history of the Mississippi madness can have no fitter introduction than a sketch of the life of its great author John Law. Historians are divided in opinion as to whether they should designate him a knave or a madman. Both epithets were unsparingly applied to him in his lifetime, and while the unhappy consequences of his projects were still deeply felt. Posterity, however, has found reason to doubt the justice of the accusation, and to confess that John Law was neither knave nor madman, but one more deceived than deceiving, more sinned against than sinning. He was thoroughly acquainted with the philosophy and true principles of credit. He understood the monetary question better than any man of his day; and if his system fell with a crash so tremendous, it was not so much his fault as that of the people amongst whom he had erected it. He did not calculate upon the avaricious frenzy of a whole nation; he did not see that confidence, like mistrust, could be increased almost *ad infinitum*, and that hope was as extravagant as fear. How was he to foretell that the French people, like the man in the fable, would kill, in their frantic eagerness, the

fine goose he had brought to lay them so many golden eggs? His fate was like that which may be supposed to have overtaken the first adventurous boatman who rowed from Erie to Ontario. Broad and smooth was the river on which he embarked; rapid and pleasant was his progress; and who was to stay him in his career? Alas for him! the cataract was nigh. He saw, when it was too late, that the tide which wafted him so joyously along was a tide of destruction; and when he endeavoured to retrace his way, he found that the current was too strong for his weak efforts to stem, and that he drew nearer every instant to the tremendous falls. Down he went over the sharp rocks, and the waters with him. *He* was dashed to pieces with his bark, but the waters, maddened and turned to foam by the rough descent, only boiled and bubbled for a time, and then flowed on again as smoothly as ever. Just so it was with Law and the French people. He was the boatman, and they were the waters.

John Law was born at Edinburgh in the year 1671. His father was the younger son of an ancient family in Fife, and carried on the business of a goldsmith and banker. He amassed considerable wealth in his trade, sufficient to enable him to gratify the wish, so common among his countrymen, of adding a territorial designation to his name. He purchased with this view the estates of Lauriston and Randleston, on the Frith of Forth, on the borders of West and Mid Lothian, and was thenceforth known as Law of Lauriston. The subject of our memoir, being the eldest son, was received into his father's counting-house at the age of fourteen, and for three years laboured hard to acquire an insight into the principles of banking as then carried on in Scotland. He had always manifested great love for the study of numbers, and his proficiency in the mathematics was considered extraordinary in one of his tender years. At the age of seventeen he was tall, strong, and well made; and his face, although deeply scarred with the small-pox, was agreeable in its expression, and full of intelligence. At this time he began to neglect his business, and becoming vain of his person, indulged in considerable extravagance of attire. He was a great

favourite with the ladies, by whom he was called Beau Law; while the other sex, despising his foppery, nicknamed him Jessamy John. At the death of his father, which happened in 1688, he withdrew entirely from the desk, which had become so irksome, and being possessed of the revenues of the paternal estate of Lauriston, he proceeded to London, to see the world.

He was now very young, very vain, good-looking, tolerably rich, and quite uncontrolled. It is no wonder that, on his arrival in the capital, he should launch out into extravagance. He soon became a regular frequenter of the gaming-houses, and by pursuing a certain plan, based upon some abstruse calculation of chances, he contrived to gain considerable sums. All the gamblers envied him his luck, and many made it a point to watch his play, and stake their money on the same chances. In affairs of gallantry he was equally fortunate; ladies of the first rank smiled graciously upon the handsome Scotchman—the young, the rich, the witty, and the obliging. But all these successes only paved the way for reverses. After he had been for nine years exposed to the dangerous attractions of the gay life he was leading, he became an irrecoverable gambler. As his love of play increased in violence, it diminished in prudence. Great losses were only to be repaired by still greater ventures, and one unhappy day he lost more than he could repay without mortgaging his family estate. To that step he was driven at last. At the same time his gallantry brought him into trouble. A love affair, or slight flirtation, with a lady of the name of Villiers,¹ exposed him to the resentment of a Mr. Wilson, by whom he was challenged to fight a duel. Law accepted, and had the ill fortune to shoot his antagonist dead upon the spot. He was arrested the same day, and brought to trial for murder by the relatives of Mr. Wilson. He was afterwards found guilty, and sentenced to death. The sentence was commuted to a fine, upon the ground that the offence only amounted to manslaughter. An appeal being lodged by a brother of the deceased, Law was detained in the King's Bench, whence, by some means or other, which he never explained, he contrived to escape; and an action being instituted against the sheriffs, he was

advertised in the Gazette, and a reward offered for his apprehension. He was described as “Captain John Law, a Scotchman, aged twenty-six; a very tall, black, lean man; well shaped, above six feet high, with large pock-holes in his face; big nosed, and speaking broad and loud.” As this was rather a caricature than a description of him, it has been supposed that it was drawn up with a view to favour his escape. He succeeded in reaching the Continent, where he travelled for three years, and devoted much of his attention to the monetary and banking affairs of the countries through which he passed. He stayed a few months in Amsterdam, and speculated to some extent in the funds. His mornings were devoted to the study of finance and the principles of trade, and his evenings to the gaming-house. It is generally believed that he returned to Edinburgh in the year 1700. It is certain that he published in that city his *Proposals and Reasons for constituting a Council of Trade*. This pamphlet did not excite much attention.

In a short time afterwards he published a project for establishing what he called a Land-bank,² the notes issued by which were never to exceed the value of the entire lands of the state, upon ordinary interest, or were to be equal in value to the land, with the right to enter into possession at a certain time. The project excited a good deal of discussion in the Scottish Parliament, and a motion for the establishment of such a bank was brought forward by a neutral party, called the Squadrone, whom Law had interested in his favour. The Parliament ultimately passed a resolution to the effect, that, to establish any kind of paper credit, so as to force it to pass, was an improper expedient for the nation.

Upon the failure of this project, and of his efforts to procure a pardon for the murder of Mr. Wilson, Law withdrew to the Continent, and resumed his old habits of gaming. For fourteen years he continued to roam about, in Flanders, Holland, Germany, Hungary, Italy, and France. He soon became intimately acquainted with the extent of the trade and resources of each, and daily more confirmed in his opinion that no country could prosper

without a paper currency. During the whole of this time he appears to have chiefly supported himself by successful play. At every gambling-house of note in the capitals of Europe he was known and appreciated as one better skilled in the intricacies of chance than any other man of the day. It is stated in the *Biographie Universelle* that he was expelled, first from Venice, and afterwards from Genoa, by the magistrates, who thought him a visitor too dangerous for the youth of those cities. During his residence in Paris he rendered himself obnoxious to D'Argenson, the lieutenant-general of the police, by whom he was ordered to quit the capital. This did not take place, however, before he had made the acquaintance, in the saloons, of the Duke de Vendôme, the Prince de Conti, and of the gay Duke of Orleans, the latter of whom was destined afterwards to exercise so much influence over his fate. The Duke of Orleans was pleased with the vivacity and good sense of the Scottish adventurer, while the latter was no less pleased with the wit and amiability of a prince who promised to become his patron. They were often thrown into each other's society, and Law seized every opportunity to instil his financial doctrines into the mind of one whose proximity to the throne pointed him out as destined, at no very distant date, to play an important part in the government.



THE REGENT OF FRANCE.

Shortly before the death of Louis XIV., or, as some say, in 1708, Law proposed a scheme of finance to Desmarests, the comptroller. Louis is reported to have inquired whether the projector were a Catholic, and on

being answered in the negative, to have declined having any thing to do with him.³

It was after this repulse that he visited Italy. His mind being still occupied with schemes of finance, he proposed to Victor Amadeus, duke of Savoy, to establish his land-bank in that country. The duke replied that his dominions were too circumscribed for the execution of so great a project, and that he was by far too poor a potentate to be ruined. He advised him, however, to try the king of France once more; for he was sure, if he knew any thing of the French character, that the people would be delighted with a plan, not only so new, but so plausible.

Louis XIV. died in 1715, and the heir to the throne being an infant only seven years of age, the Duke of Orleans assumed the reins of government, as regent, during his minority. Law now found himself in a more favourable position. The tide in his affairs had come, which, taken at the flood, was to waft him on to fortune. The regent was his friend, already acquainted with his theory and pretensions, and inclined, moreover, to aid him in any efforts to restore the wounded credit of France, bowed down to the earth by the extravagance of the long reign of Louis XIV.

Hardly was that monarch laid in his grave ere the popular hatred, suppressed so long, burst forth against his memory. He who, during his life, had been flattered with an excess of adulation, to which history scarcely offers a parallel, was now cursed as a tyrant, a bigot, and a plunderer. His statues were pelted and disfigured; his effigies torn down, amid the execrations of the populace, and his name rendered synonymous with selfishness and oppression. The glory of his arms was forgotten, and nothing was remembered but his reverses, his extravagance, and his cruelty.

The finances of the country were in a state of the utmost disorder. A profuse and corrupt monarch, whose profuseness and corruption were imitated by almost every functionary, from the highest to the lowest grade, had brought France to the verge of ruin. The national debt amounted to

3000 millions of livres, the revenue to 145 millions, and the expenses of government to 142 millions per annum; leaving only three millions to pay the interest upon 3000 millions. The first care of the regent was to discover a remedy for an evil of such magnitude, and a council was early summoned to take the matter into consideration. The Duke de St. Simon was of opinion that nothing could save the country from revolution but a remedy at once bold and dangerous. He advised the regent to convoke the states-general, and declare a national bankruptcy. The Duke de Noailles, a man of accommodating principles, an accomplished courtier, and totally averse from giving himself any trouble or annoyance that ingenuity could escape from, opposed the project of St. Simon with all his influence. He represented the expedient as alike dishonest and ruinous. The regent was of the same opinion, and this desperate remedy fell to the ground.

The measures ultimately adopted, though they promised fair, only aggravated the evil. The first, and most dishonest measure was of no advantage to the state. A recoinage was ordered, by which the currency was depreciated one-fifth; those who took a thousand pieces of gold or silver to the mint received back an amount of coin of the same nominal value, but only four-fifths of the weight of metal. By this contrivance the treasury gained seventy-two millions of livres, and all the commercial operations of the country were disordered. A trifling diminution of the taxes silenced the clamours of the people, and for the slight present advantage the great prospective evil was forgotten.

A Chamber of Justice was next instituted to inquire into the malversations of the loan-contractors and the farmers of the revenues. Tax-collectors are never very popular in any country, but those of France at this period deserved all the odium with which they were loaded. As soon as these farmers-general, with all their hosts of subordinate agents, called *maltôtiers*,⁴ were called to account for their misdeeds, the most extravagant joy took possession of the nation. The Chamber of Justice, instituted chiefly for this purpose, was endowed with very extensive

powers. It was composed of the presidents and councils of the parliament, the judges of the Courts of Aid and of Requests, and the officers of the Chamber of Account, under the general presidency of the minister of finance. Informers were encouraged to give evidence against the offenders by the promise of one-fifth part of the fines and confiscations. A tenth of all concealed effects belonging to the guilty was promised to such as should furnish the means of discovering them.

The promulgation of the edict constituting this court caused a degree of consternation among those principally concerned, which can only be accounted for on the supposition that their peculation had been enormous. But they met with no sympathy. The proceedings against them justified their terror. The Bastille was soon unable to contain the prisoners that were sent to it, and the gaols all over the country teemed with guilty or suspected persons. An order was issued to all innkeepers and postmasters to refuse horses to such as endeavoured to seek safety in flight; and all persons were forbidden, under heavy fines, to harbour them or favour their evasion. Some were condemned to the pillory, others to the galleys, and the least guilty to fine and imprisonment. One only, Samuel Bernard, a rich banker and farmer-general of a province remote from the capital, was sentenced to death. So great had been the illegal profits of this man,—looked upon as the tyrant and oppressor of his district,—that he offered six millions of livres, or 250,000*l.* sterling, to be allowed to escape.

His bribe was refused, and he suffered the penalty of death. Others, perhaps more guilty, were more fortunate. Confiscation, owing to the concealment of their treasures by the delinquents, often produced less money than a fine. The severity of the government relaxed, and fines, under the denomination of taxes, were indiscriminately levied upon all offenders; but so corrupt was every department of the administration, that the country benefited but little by the sums which thus flowed into the treasury. Courtiers and courtiers' wives and mistresses came in for the chief share of the spoils. One contractor had been taxed, in proportion to

his wealth and guilt, at the sum of twelve millions of livres. The Count * * *,
a man of some weight in the government, called upon him, and offered to procure a remission of the fine if he would give him a hundred thousand crowns. “Vous êtes trop tard, mon ami,” replied the financier; “I have already made a bargain with your wife for fifty thousand.”⁵

About a hundred and eighty millions of livres were levied in this manner, of which eighty were applied in payment of the debts contracted by the government. The remainder found its way into the pockets of the courtiers. Madame de Maintenon, writing on this subject, says,—“We hear every day of some new grant of the regent. The people murmur very much at this mode of employing the money taken from the speculators.” The people, who, after the first burst of their resentment is over, generally express a sympathy for the weak, were indignant that so much severity should be used to so little purpose. They did not see the justice of robbing one set of rogues to fatten another. In a few months all the more guilty had been brought to punishment, and the Chamber of Justice looked for victims in humbler walks of life. Charges of fraud and extortion were brought against tradesmen of good character in consequence of the great inducements held out to common informers. They were compelled to lay open their affairs before this tribunal in order to establish their innocence. The voice of complaint resounded from every side; and at the expiration of a year the government found it advisable to discontinue further proceedings. The Chamber of Justice was suppressed, and a general amnesty granted to all against whom no charges had yet been preferred.

In the midst of this financial confusion Law appeared upon the scene. No man felt more deeply than the regent the deplorable state of the country, but no man could be more averse from putting his shoulders manfully to the wheel. He disliked business; he signed official documents without proper examination, and trusted to others what he should have undertaken himself. The cares inseparable from his high office were burdensome to him. He saw that something was necessary to be done; but he lacked the

energy to do it, and had not virtue enough to sacrifice his ease and his pleasures in the attempt. No wonder that, with this character, he listened favourably to the mighty projects, so easy of execution, of the clever adventurer whom he had formerly known, and whose talents he appreciated.

When Law presented himself at court he was most cordially received. He offered two memorials to the regent, in which he set forth the evils that had befallen France, owing to an insufficient currency, at different times depreciated. He asserted that a metallic currency, unaided by a paper money, was wholly inadequate to the wants of a commercial country, and particularly cited the examples of Great Britain and Holland to shew the advantages of paper. He used many sound arguments on the subject of credit, and proposed as a means of restoring that of France, then at so low an ebb among the nations, that he should be allowed to set up a bank, which should have the management of the royal revenues, and issue notes both on that and on landed security. He further proposed that this bank should be administered in the king's name, but subject to the control of commissioners to be named by the States-General.

While these memorials were under consideration, Law translated into French his essay on money and trade, and used every means to extend through the nation his renown as a financier. He soon became talked of. The confidants of the regent spread abroad his praise, and every one expected great things of Monsieur Lass.⁶

On the 5th of May, 1716, a royal edict was published, by which Law was authorised, in conjunction with his brother, to establish a bank under the name of Law and Company, the notes of which should be received in payment of the taxes. The capital was fixed at six millions of livres, in twelve thousand shares of five hundred livres each, purchasable one fourth in specie, and the remainder in *billets d'état*. It was not thought expedient to grant him the whole of the privileges prayed for in his memorials until experience should have shewn their safety and advantage.

Law was now on the high road to fortune. The study of thirty years was brought to guide him in the management of his bank. He made all his notes payable at sight, and in the coin current at the time they were issued. This last was a master-stroke of policy, and immediately rendered his notes more valuable than the precious metals. The latter were constantly liable to depreciation by the unwise tampering of the government. A thousand livres of silver might be worth their nominal value one day, and be reduced one-sixth the next, but a note of Law's bank retained its original value. He publicly declared at the same time, that a banker deserved death if he made issues without having sufficient security to answer all demands. The consequence was, that his notes advanced rapidly in public estimation, and were received at one per cent more than specie. It was not long before the trade of the country felt the benefit. Languishing commerce began to lift up her head; the taxes were paid with greater regularity and less murmuring; and a degree of confidence was established that could not fail, if it continued, to become still more advantageous. In the course of a year, Law's notes rose to fifteen per cent premium, while the *billets d'état*, or notes issued by the government as security for the debts contracted by the extravagant Louis XIV., were at a discount of no less than seventy-eight and a half per cent. The comparison was too great in favour of Law not to attract the attention of the whole kingdom, and his credit extended itself day by day. Branches of his bank were almost simultaneously established at Lyons, Rochelle, Tours, Amiens, and Orleans.

The regent appears to have been utterly astonished at his success, and gradually to have conceived the idea that paper, which could so aid a metallic currency, could entirely supersede it. Upon this fundamental error he afterwards acted. In the mean time, Law commenced the famous project which has handed his name down to posterity. He proposed to the regent (who could refuse him nothing) to establish a company that should have the exclusive privilege of trading to the great river Mississippi and the province of Louisiana, on its western bank. The country was supposed to

abound in the precious metals; and the company, supported by the profits of their exclusive commerce, were to be the sole farmers of the taxes and sole coiners of money. Letters patent were issued, incorporating the company, in August 1717. The capital was divided into two hundred thousand shares of five hundred livres each, the whole of which might be paid in *billets d'état*, at their nominal value, although worth no more than a hundred and sixty livres in the market.

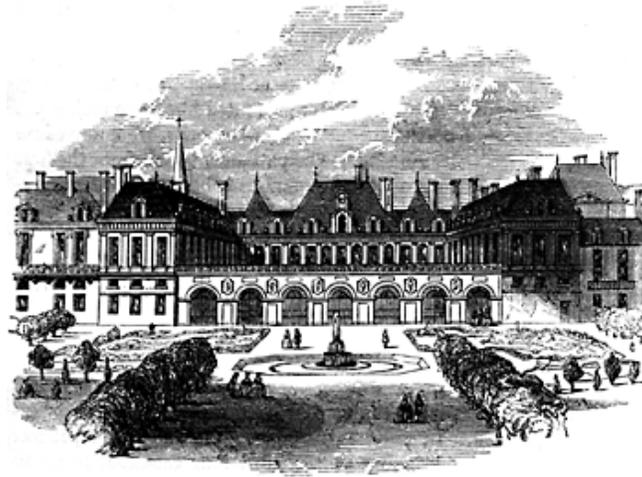
It was now that the frenzy of speculating began to seize upon the nation. Law's bank had effected so much good, that any promises for the future which he thought proper to make were readily believed. The regent every day conferred new privileges upon the fortunate projector. The bank obtained the monopoly of the sale of tobacco, the sole right of refining of gold and silver, and was finally erected into the Royal Bank of France. Amid the intoxication of success, both Law and the regent forgot the maxim so loudly proclaimed by the former, that a banker deserved death who made issues of paper without the necessary funds to provide for them. As soon as the bank, from a private, became a public institution, the regent caused a fabrication of notes to the amount of one thousand millions of livres. This was the first departure from sound principles, and one for which Law is not justly blameable. While the affairs of the bank were under his control, the issues had never exceeded sixty millions. Whether Law opposed the inordinate increase is not known; but as it took place as soon as the bank was made a royal establishment, it is but fair to lay the blame of the change of system upon the regent.

Law found that he lived under a despotic government; but he was not yet aware of the pernicious influence which such a government could exercise upon so delicate a framework as that of credit. He discovered it afterwards to his cost, but in the meantime suffered himself to be impelled by the regent into courses which his own reason must have disapproved. With a weakness most culpable, he lent his aid in inundating the country with paper money, which, based upon no solid foundation, was sure to fall,

sooner or later. The extraordinary present fortune dazzled his eyes, and prevented him from seeing the evil day that would burst over his head, when once, from any cause or other, the alarm was sounded. The parliament were from the first jealous of his influence as a foreigner, and had, besides, their misgivings as to the safety of his projects. As his influence extended, their animosity increased. D'Aguesseau, the chancellor, was unceremoniously dismissed by the regent for his opposition to the vast increase of paper money, and the constant depreciation of the gold and silver coin of the realm. This only served to augment the enmity of the parliament, and when D'Argenson, a man devoted to the interests of the regent, was appointed to the vacant chancellorship, and made at the same time minister of finance, they became more violent than ever. The first measure of the new minister caused a further depreciation of the coin. In order to extinguish the *billets d'état*, it was ordered that persons bringing to the mint four thousand livres in specie and one thousand livres in *billets d'état*, should receive back coin to the amount of five thousand livres. D'Argenson plumed himself mightily upon thus creating five thousand new and smaller livres out of the four thousand old and larger ones, being too ignorant of the true principles of trade and credit to be aware of the immense injury he was inflicting upon both.

The parliament saw at once the impolicy and danger of such a system, and made repeated remonstrances to the regent. The latter refused to entertain their petitions, when the parliament, by a bold and very unusual stretch of authority, commanded that no money should be received in payment but that of the old standard. The regent summoned a *lit de justice*, and annulled the decree. The parliament resisted, and issued another. Again the regent exercised his privilege, and annulled it, till the parliament, stung to fiercer opposition, passed another decree, dated August 12th, 1718, by which they forbade the bank of Law to have any concern, either direct or indirect, in the administration of the revenue; and prohibited all

foreigners, under heavy penalties, from interfering, either in their own names, or in that of others, in the management of the finances of the state. The parliament considered Law to be the author of all the evil, and some of the councillors, in the virulence of their enmity, proposed that he should be brought to trial, and, if found guilty, be hung at the gates of the Palais de Justice.



PALAIS ROYAL FROM THE GARDEN.

Law, in great alarm, fled to the Palais Royal, and threw himself on the protection of the regent, praying that measures might be taken to reduce the parliament to obedience. The regent had nothing so much at heart, both on that account and because of the disputes that had arisen relative to the legitimation of the Duke of Maine and the Count of Thoulouse, the sons of the late king. The parliament was ultimately overawed by the arrest of their president and two of the councillors, who were sent to distant prisons.

Thus the first cloud upon Law's prospects blew over: freed from apprehension of personal danger, he devoted his attention to his famous Mississippi project, the shares of which were rapidly rising, in spite of the parliament. At the commencement of the year 1719, an edict was published, granting to the Mississippi Company the exclusive privilege of trading to the East Indies, China, and the South Seas, and to all the possessions of the French East India Company, established by Colbert. The Company, in

consequence of this great increase of their business, assumed, as more appropriate, the title of Company of the Indies, and created fifty thousand new shares. The prospects now held out by Law were most magnificent. He promised a yearly dividend of two hundred livres upon each share of five hundred, which, as the shares were paid for in *billets d'état* at their nominal value, but worth only 100 livres, was at the rate of about 120 per cent profit.



LAW'S HOUSE; RUE DE QUINCAMPOIX.

The public enthusiasm, which had been so long rising, could not resist a vision so splendid. At least three hundred thousand applications were made for the fifty thousand new shares, and Law's house in the Rue de Quincampoix was beset from morning to night by the eager applicants. As it was impossible to satisfy them all, it was several weeks before a list of the fortunate new stockholders could be made out, during which time the public impatience rose to a pitch of frenzy. Dukes, marquises, counts, with their duchesses, marchionesses, and countesses, waited in the streets for hours every day before Mr. Law's door to know the result. At last, to avoid

the jostling of the plebeian crowd, which, to the number of thousands, filled the whole thoroughfare, they took apartments in the adjoining houses, that they might be continually near the temple whence the new Plutus was diffusing wealth. Every day the value of the old shares increased, and the fresh applications, induced by the golden dreams of the whole nation, became so numerous that it was deemed advisable to create no less than three hundred thousand new shares, at five thousand livres each, in order that the regent might take advantage of the popular enthusiasm to pay off the national debt. For this purpose, the sum of fifteen hundred millions of livres was necessary. Such was the eagerness of the nation, that thrice the sum would have been subscribed if the government had authorised it.

Law was now at the zenith of his prosperity, and the people were rapidly approaching the zenith of their infatuation. The highest and the lowest classes were alike filled with a vision of boundless wealth. There was not a person of note among the aristocracy, with the exception of the Duke of St. Simon and Marshal Villars, who was not engaged in buying or selling stock. People of every age and sex and condition in life speculated in the rise and fall of the Mississippi bonds. The Rue de Quincampoix was the grand resort of the jobbers, and it being a narrow, inconvenient street, accidents continually occurred in it, from the tremendous pressure of the crowd. Houses in it, worth, in ordinary times, a thousand livres of yearly rent, yielded as much as twelve or sixteen thousand. A cobbler, who had a stall in it, gained about two hundred livres a day by letting it out, and furnishing writing materials to brokers and their clients. The story goes, that a hunchbacked man who stood in the street gained considerable sums by lending his hump as a writing-desk to the eager speculators! The great concourse of persons who assembled to do business brought a still greater concourse of spectators. These again drew all the thieves and immoral characters of Paris to the spot, and constant riots and disturbances took

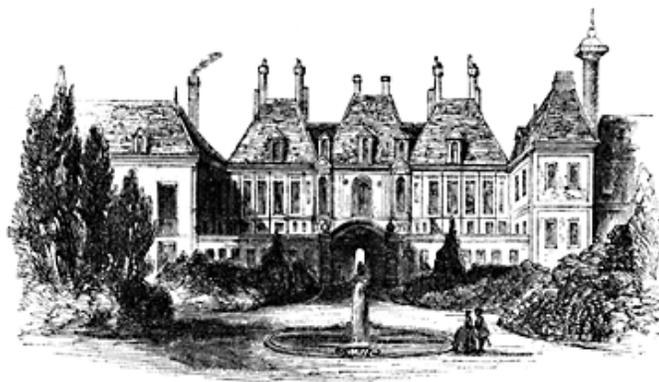
place. At nightfall, it was often found necessary to send a troop of soldiers to clear the street.



THE HUNCHBACK.

Law, finding the inconvenience of his residence, removed to the Place Vendôme, whither the crowd of *agoteurs* followed him. That spacious square soon became as thronged as the Rue de Quincampoix: from morning to night it presented the appearance of a fair. Booths and tents were erected for the transaction of business and the sale of refreshments, and gamblers with their roulette tables stationed themselves in the very middle of the place, and reaped a golden, or rather a paper, harvest from the throng. The boulevards and public gardens were forsaken; parties of pleasure took their walks in preference in the Place Vendôme, which became the fashionable lounge of the idle, as well as the general rendezvous of the busy. The noise was so great all day, that the chancellor, whose court was situated in the square, complained to the regent and the municipality, that he could not hear the advocates. Law, when applied to, expressed his willingness to aid in the removal of the nuisance, and for this

purpose entered into a treaty with the Prince de Carignan for the Hôtel de Soissons, which had a garden of several acres in the rear. A bargain was concluded, by which Law became the purchaser of the hotel at an enormous price, the prince reserving to himself the magnificent gardens as a new source of profit. They contained some fine statues and several fountains, and were altogether laid out with much taste. As soon as Law was installed in his new abode, an edict was published, forbidding all persons to buy or sell stock any where but in the gardens of the Hôtel de Soissons. In the midst, among the trees, about five hundred small tents and pavilions were erected, for the convenience of the stock-jobbers. Their various colours, the gay ribands and banners which floated from them, the busy crowds which passed continually in and out—the incessant hum of voices, the noise, the music, and the strange mixture of business and pleasure on the countenances of the throng, all combined to give the place an air of enchantment that quite enraptured the Parisians. The Prince de Carignan made enormous profits while the delusion lasted. Each tent was let at the rate of five hundred livres a month; and, as there were at least five hundred of them, his monthly revenue from this source alone must have amounted to 250,000 livres, or upwards of 10,000^{l.} sterling.



HOTEL DE SOISSONS.

The honest old soldier, Marshal Villars, was so vexed to see the folly which had smitten his countrymen, that he never could speak with temper on the subject. Passing one day through the Place Vendôme in his carriage,

the choleric gentleman was so annoyed at the infatuation of the people, that he abruptly ordered his coachman to stop, and, putting his head out of the carriage window, harangued them for full half an hour on their "disgusting avarice." This was not a very wise proceeding on his part. Hisses and shouts of laughter resounded from every side, and jokes without number were aimed at him. There being at last strong symptoms that something more tangible was flying through the air in the direction of his head, the marshal was glad to drive on. He never again repeated the experiment.

Two sober, quiet, and philosophic men of letters, M. de la Motte and the Abbé Terrason, congratulated each other, that they, at least, were free from this strange infatuation. A few days afterwards, as the worthy abbé was coming out of the Hôtel de Soissons, whither he had gone to buy shares in the Mississippi, whom should he see but his friend La Motte entering for the same purpose. "Ha!" said the abbé smiling, "is that *you*?" "Yes," said La Motte, pushing past him as fast as he was able; "and can that be *you*?" The next time the two scholars met, they talked of philosophy, of science, and of religion, but neither had courage for a long time to breathe one syllable about the Mississippi. At last, when it was mentioned, they agreed that a man ought never to swear against his doing any one thing, and that there was no sort of extravagance of which even a wise man was not capable.

During this time, Law, the new Plutus, had become all at once the most important personage of the state. The ante-chambers of the regent were forsaken by the courtiers, Peers, judges, and bishops thronged to the Hôtel de Soissons; officers of the army and navy, ladies of title and fashion, and every one to whom hereditary rank or public employ gave a claim to precedence, were to be found waiting in his ante-chambers to beg for a portion of his India stock. Law was so pestered that he was unable to see one-tenth part of the applicants, and every manœuvre that ingenuity could suggest was employed to gain access to him. Peers, whose dignity would have been outraged if the regent had made them wait half an hour for an

interview, were content to wait six hours for the chance of seeing Monsieur Law. Enormous fees were paid to his servants, if they would merely announce their names. Ladies of rank employed the blandishments of their smiles for the same object; but many of them came day after day for a fortnight before they could obtain an audience. When Law accepted an invitation, he was sometimes so surrounded by ladies, all asking to have their names put down in his lists as shareholders in the new stock, that, in spite of his well-known and habitual gallantry, he was obliged to tear himself away *par force*. The most ludicrous stratagems were employed to have an opportunity of speaking to him. One lady, who had striven in vain during several days, gave up in despair all attempts to see him at his own house, but ordered her coachman to keep a strict watch whenever she was out in her carriage, and if he saw Mr. Law coming, to drive against a post and upset her. The coachman promised obedience, and for three days the lady was driven incessantly through the town, praying inwardly for the opportunity to be overturned. At last she espied Mr. Law, and, pulling the string, called out to the coachman, "Upset us now! for God's sake, upset us now!" The coachman drove against a post, the lady screamed, the coach was overturned, and Law, who had seen the *accident*, hastened to the spot to render assistance. The cunning dame was led into the Hôtel de Soissons, where she soon thought it advisable to recover from her fright, and, after apologising to Mr. Law, confessed her stratagem. Law smiled, and entered the lady in his books as the purchaser of a quantity of India stock. Another story is told of a Madame de Boucha, who, knowing that Mr. Law was at dinner at a certain house, proceeded thither in her carriage, and gave the alarm of fire. The company started from table, and Law among the rest; but, seeing one lady making all haste into the house towards him, while every body else was scampering away, he suspected the trick, and ran off in another direction.



Many other anecdotes are related, which even though they may be a little exaggerated, are nevertheless worth preserving, as shewing the spirit of that singular period.⁷ The regent was one day mentioning, in the presence of D'Argenson, the Abbé Dubois, and some other persons, that he was desirous of deputing some lady, of the rank at least of a duchess, to attend upon his daughter at Modena; "but," added he, "I do not exactly know where to find one." "No!" replied one, in affected surprise; "I can tell you where to find every duchess in France: you have only to go to Mr. Law's; you will see them every one in his ante-chamber."

M. de Chirac, a celebrated physician, had bought stock at an unlucky period, and was very anxious to sell out. Stock, however, continued to fall for two or three days, much to his alarm. His mind was filled with the subject, when he was suddenly called upon to attend a lady who imagined herself unwell. He arrived, was shewn up stairs, and felt the lady's pulse. "It falls! it falls! good God! it falls continually!" said he musingly, while the lady looked up in his face all anxiety for his opinion. "Oh, M. de Chirac," said she, starting to her feet and ringing the bell for assistance; "I am dying! I am dying! it falls! it falls! it falls!" "What falls?" inquired the doctor

in amazement. "My pulse! my pulse!" said the lady; "I must be dying." "Calm your apprehensions, my dear madam," said M. de Chirac; "I was speaking of the stocks. The truth is, I have been a great loser, and my mind is so disturbed, I hardly know what I have been saying."

The price of shares sometimes rose ten or twenty per cent in the course of a few hours, and many persons in the humbler walks of life, who had risen poor in the morning, went to bed in affluence. An extensive holder of stock, being taken ill, sent his servant to sell two hundred and fifty shares, at eight thousand livres each, the price at which they were then quoted. The servant went, and, on his arrival in the Jardin de Soissons, found that in the interval the price had risen to ten thousand livres. The difference of two thousand livres on the two hundred and fifty shares, amounting to 500,000 livres, or 20,000*l.* sterling, he very coolly transferred to his own use, and giving the remainder to his master, set out the same evening for another country. Law's coachman in a very short time made money enough to set up a carriage of his own, and requested permission to leave his service. Law, who esteemed the man, begged of him as a favour, that he would endeavour, before he went, to find a substitute as good as himself. The coachman consented, and in the evening brought two of his former comrades, telling Mr. Law to choose between them, and he would take the other. Cookmaids and footmen were now and then as lucky, and, in the full-blown pride of their easily-acquired wealth, made the most ridiculous mistakes. Preserving the language and manners of their old, with the finery of their new station, they afforded continual subjects for the pity of the sensible, the contempt of the sober, and the laughter of every body. But the folly and meanness of the higher ranks of society were still more disgusting. One instance alone, related by the Duke de St. Simon, will shew the unworthy avarice which infected the whole of society. A man of the name of André, without character or education, had, by a series of well-timed speculations in Mississippi bonds, gained enormous wealth in an incredibly short space of time. As St. Simon expresses it, "he had amassed

mountains of gold.” As he became rich, he grew ashamed of the lowness of his birth, and anxious above all things to be allied to nobility. He had a daughter, an infant only three years of age, and he opened a negotiation with the aristocratic and needy family of D’Oyse, that this child should, upon certain conditions, marry a member of that house. The Marquis D’Oyse, to his shame, consented, and promised to marry her himself on her attaining the age of twelve, if the father would pay him down the sum of a hundred thousand crowns, and twenty thousand livres every year until the celebration of the marriage. The marquis was himself in his thirty-third year. This scandalous bargain was duly signed and sealed, the stockjobber furthermore agreeing to settle upon his daughter, on the marriage-day, a fortune of several millions. The Duke of Brancas, the head of the family, was present throughout the negotiation, and shared in all the profits. St. Simon, who treats the matter with the levity becoming what he thought so good a joke, adds, “that people did not spare their animadversions on this beautiful marriage,” and further informs us, “that the project fell to the ground some months afterwards by the overthrow of Law, and the ruin of the ambitious Monsieur André.” It would appear, however, that the noble family never had the honesty to return the hundred thousand crowns.

Amid events like these, which, humiliating though they be, partake largely of the ludicrous, others occurred of a more serious nature. Robberies in the streets were of daily occurrence, in consequence of the immense sums, in paper, which people carried about with them. Assassinations were also frequent. One case in particular fixed the attention of the whole of France, not only on account of the enormity of the offence, but of the rank and high connexions of the criminal.



The Count d'Horn, a younger brother of the Prince d'Horn, and related to the noble families of D'Aremberg, De Ligne, and De Montmorency, was a young man of dissipated character, extravagant to a degree, and unprincipled as he was extravagant. In connexion with two other young men as reckless as himself, named Mille, a Piedmontese captain, and one Destampes, or Lestang, a Fleming, he formed a design to rob a very rich broker, who was known, unfortunately for himself, to carry great sums about his person. The count pretended a desire to purchase of him a number of shares in the Company of the Indies, and for that purpose appointed to meet him in a *cabaret*, or low public-house, in the neighbourhood of the

Place Vendôme. The unsuspecting broker was punctual to his appointment; so were the Count d'Horn and his two associates, whom he introduced as his particular friends. After a few moments' conversation, the Count d'Horn suddenly sprang upon his victim, and stabbed him three times in the breast with a poniard. The man fell heavily to the ground, and, while the count was employed in rifling his portfolio of bonds in the Mississippi and Indian schemes to the amount of one hundred thousand crowns, Mille, the Piedmontese, stabbed the unfortunate broker again and again, to make sure of his death, But the broker did not fall without a struggle, and his cries brought the people of the *cabaret* to his assistance. Lestang, the other assassin, who had been set to keep watch at a staircase, sprang from a window and escaped; but Mille and the Count d'Horn were seized in the very act.

This crime, committed in open day, and in so public a place as a *cabaret*, filled Paris with consternation. The trial of the assassins commenced on the following day; and the evidence being so clear, they were both found guilty, and condemned, to be broken alive on the wheel. The noble relatives of the Count d'Horn absolutely blocked up the ante-chambers of the regent, praying for mercy on the misguided youth, and alleging that he was insane. The regent avoided them as long as possible, being determined that, in a case so atrocious, justice should take its course. But the importunity of these influential suitors was not to be overcome so silently; and they at last forced themselves into the presence of the regent, and prayed him to save their house the shame of a public execution. They hinted that the Princes d'Horn were allied to the illustrious family of Orleans; and added, that the regent himself would be disgraced if a kinsman

of his should die by the hands of a common executioner. The regent, to his credit, was proof against all their solicitations, and replied to their last argument in the words of Corneille:

“Le crime fait la honte, et non pas l'échafaud:”

adding, that whatever shame there might be in the punishment he would very willingly share with the other relatives. Day after day they renewed their entreaties, but always with the same result. At last they thought, that if they could interest the Duke de St. Simon in their favour—a man, for whom the regent felt sincere esteem—they might succeed in their object. The duke, a thorough aristocrat, was as shocked as they were that a noble assassin should die by the same death as a plebeian felon, and represented to the regent the impolicy of making enemies of so numerous, wealthy, and powerful a family. He urged, too, that in Germany, where the family of D'Aremberg had large possessions, it was the law, that no relative of a person broken on the wheel could succeed to any public office or employ until a whole generation had passed away. For this reason, he thought the punishment of the guilty count might be transmuted into beheading, which was considered all over Europe as much less infamous. The regent was moved by this argument, and was about to consent, when Law, who felt peculiarly interested in the fate of the murdered man, confirmed him in his former resolution to let the law take its course.

The relatives of D'Horn were now reduced to the last extremity. The Prince de Robec Montmorency, despairing of other methods, found means to penetrate into the dungeon of the criminal, and offering him a cup of poison, implored him to save them from disgrace. The Count d'Horn turned away his head, and refused to

take it. Montmorency pressed him once more; and losing all patience at his continued refusal, turned on his heel, and exclaiming, "Die, then, as thou wilt, mean-spirited wretch! thou art fit only to perish by the hands of the hangman!" left him to his fate.

D'Horn himself petitioned the regent that he might be beheaded; but Law, who exercised more influence over his mind than any other person, with the exception of the notorious Abbé Dubois, his tutor, insisted that he could not in justice succumb to the self-interested views of the D'Horns. The regent had from the first been of the same opinion; and within six days after the commission of their crime, D'Horn and Mille were broken on the wheel in the Place de Grève. The other assassin, Lestang, was never apprehended.

This prompt and severe justice was highly pleasing to the populace of Paris. Even M. de Quincampoix, as they called Law, came in for a share of their approbation for having induced the regent to shew no favour to a patrician. But the number of robberies and assassinations did not diminish; no sympathy was shewn for rich jobbers when they were plundered. The general laxity of public morals, conspicuous enough before, was rendered still more so by its rapid pervasion of the middle classes, who had hitherto remained comparatively pure between the open vices of the class above and the hidden crimes of the class below them. The pernicious love of gambling diffused itself through society, and bore all public and nearly all private virtue before it.

For a time, while confidence lasted, an impetus was given to trade which could not fail to be beneficial. In Paris especially the good results were felt. Strangers flocked into the capital from every part, bent not only upon making money, but on spending it. The Duchess

of Orleans, mother of the regent, computes the increase of the population during this time, from the great influx of strangers from all parts of the world, at 305,000 souls. The housekeepers were obliged to make up beds in garrets, kitchens, and even stables, for the accommodation of lodgers; and the town was so full of carriages and vehicles of every description, that they were obliged, in the principal streets, to drive at a foot-pace for fear of accidents. The looms of the country worked with unusual activity to supply rich laces, silks, broad-cloth, and velvets, which being paid for in abundant paper, increased in price four-fold. Provisions shared the general advance. Bread, meat, and vegetables were sold at prices greater than had ever before been known; while the wages of labour rose in exactly the same proportion. The artisan who formerly gained fifteen sous per diem now gained sixty. New houses were built in every direction; an illusory prosperity shone over the land, and so dazzled the eyes of the whole nation, that none could see the dark cloud on the horizon announcing the storm that was too rapidly approaching.

Law himself, the magician whose wand had wrought so surprising a change, shared, of course, in the general prosperity. His wife and daughter were courted by the highest nobility, and their alliance sought by the heirs of ducal and princely houses. He bought two splendid estates in different parts of France, and entered into a negotiation with the family of the Duke de Sully for the purchase of the marquisate of Rosny. His religion being an obstacle to his advancement, the regent promised, if he would publicly conform to the Catholic faith, to make him comptroller-general of the finances. Law, who had no more real religion than any other professed

gambler, readily agreed, and was confirmed by the Abbé de Tencin in the cathedral of Melun, in presence of a great crowd of spectators⁸. On the following day he was elected honorary churchwarden of the parish of St. Roch, upon which occasion he made it a present of the sum of five hundred thousand livres. His charities, always magnificent, were not always so ostentatious. He gave away great sums privately, and no tale of real distress ever reached his ears in vain.

At this time he was by far the most influential person of the state. The Duke of Orleans had so much confidence in his sagacity and the success of his plans, that he always consulted him upon every matter of moment. He was by no means unduly elevated by his prosperity, but remained the same simple, affable, sensible man that he had shewn himself in adversity. His gallantry, which was always delightful to the fair objects of it, was of a nature so kind, so gentlemanly, and so respectful, that not even a lover could have taken offence at it. If upon any occasion he shewed any symptoms of haughtiness, it was to the cringing nobles who lavished their adulation upon him till it became fulsome. He often took pleasure in seeing how long he could make them dance attendance upon him for a single favour. To such of his own countrymen as by chance visited Paris, and sought an interview with him, he was, on the contrary, all politeness and attention. When Archibald Campbell, Earl of Islay, and afterwards Duke of Argyle, called upon him in the Place Vendôme, he had to pass through an ante-chamber crowded with persons of the first distinction, all anxious to see the great financier, and have their names put down as first on the list of some new subscription. Law himself was quietly sitting in his library, writing a

letter to the gardener at his paternal estate of Lauriston about the planting of some cabbages! The earl stayed for a considerable time, played a game of piquet with his countryman, and left him, charmed with his ease, good sense, and good breeding.



LAW AS ATLAS.⁹

Among the nobles who, by means of the public credulity at this time, gained sums sufficient to repair their ruined fortunes, may be mentioned the names of the Dukes de Bourbon, de Guiche, de la Force,¹⁰ de Chaulnes, and d'Antin; the Marechal d'Estrées; the Princes de Rohan, de Poix, and de Léon. The Duke de Bourbon, son of Louis XIV. by Madame de Montespan, was peculiarly fortunate in his speculations in Mississippi paper. He rebuilt the royal residence of Chantilly in a style of unwonted magnificence; and being passionately fond of horses, he erected a range of stables, which were long renowned throughout Europe, and imported a hundred and fifty of the finest racers from England to improve the breed in France. He bought a large extent of country in Picardy, and became possessed of nearly all the valuable lands lying between the Oise and the Somme.

When fortunes such as these were gained, it is no wonder that Law should have been almost worshipped by the mercurial population. Never was monarch more flattered than he was. All the small poets

and *littérateurs* of the day poured floods of adulation upon him. According to them, he was the saviour of the country, the tutelary divinity of France; wit was in all his words, goodness in all his looks, and wisdom in all his actions. So great a crowd followed his carriage whenever he went abroad, that the regent sent him a troop of horse as his permanent escort to clear the streets before him.

It was remarked at this time that Paris had never before been so full of objects of elegance and luxury. Statues, pictures, and tapestries were imported in great quantities from foreign countries, and found a ready market. All those pretty trifles in the way of furniture and ornament which the French excel in manufacturing were no longer the exclusive playthings of the aristocracy, but were to be found in abundance in the houses of traders and the middle classes in general. Jewellery of the most costly description was brought to Paris as the most favourable mart; among the rest, the famous diamond bought by the regent, and called by his name, and which long adorned the crown of France. It was purchased for the sum of two millions of livres, under circumstances which shew that the regent was not so great a gainer as some of his subjects by the impetus which trade had received. When the diamond was first offered to him, he refused to buy it, although he desired above all things to possess it, alleging as his reason, that his duty to the country he governed would not allow him to spend so large a sum of the public money for a mere jewel. This valid and honourable excuse threw all the ladies of the court into alarm, and nothing was heard for some days but expressions of regret that so rare a gem should be allowed to go out of France, no private individual being rich enough to buy it. The regent was continually importuned about it, but all in

vain, until the Duke de St. Simon, who with all his ability was something of a twaddler, undertook the weighty business. His entreaties being seconded by Law, the good-natured regent gave his consent, leaving to Law's ingenuity to find the means to pay for it. The owner took security for the payment of the sum of two millions of livres within a stated period, receiving in the mean time the interest of five per cent upon that amount, and being allowed, besides, all the valuable clippings of the gem. St. Simon, in his *Memoirs*, relates with no little complacency his share in this transaction. After describing the diamond to be as large as a greengage, of a form nearly round, perfectly white, and without flaw, and weighing more than five hundred grains, he concludes with a chuckle, by telling the world "that he takes great credit to himself for having induced the regent to make so illustrious a purchase." In other words, he was proud that he had induced him to sacrifice his duty, and buy a bauble for himself at an extravagant price out of the public money.

Thus the system continued to flourish till the commencement of the year 1720. The warnings of the parliament, that too great a creation of paper money would, sooner or later, bring the country to bankruptcy, were disregarded. The regent, who knew nothing whatever of the philosophy of finance, thought that a system which had produced such good effects could never be carried to excess. If five hundred millions of paper had been of such advantage, five hundred millions additional would be of still greater advantage. This was the grand error of the regent, and which Law did not attempt to dispel. The extraordinary avidity of the people kept up the delusion; and the higher the price of Indian and Mississippi stock, the more

billets de banque were issued to keep pace with it. The edifice thus reared might not unaptly be compared to the gorgeous palace erected by Potemkin, that princely barbarian of Russia, to surprise and please his imperial mistress: huge blocks of ice were piled one upon another; ionic pillars, of chastest workmanship, in ice, formed a noble portico; and a dome, of the same material, shone in the sun, which had just strength enough to gild, but not to melt it. It glittered afar, like a palace of crystals and diamonds; but there came one warm breeze from the south, and the stately building dissolved away, till none were able even to gather up the fragments. So with Law and his paper system. No sooner did the breath of popular mistrust blow steadily upon it, than it fell to ruins, and none could raise it up again.

The first slight alarm that was occasioned was early in 1720. The Prince de Conti, offended that Law should have denied him fresh shares in India stock, at his own price, sent to his bank to demand payment in specie of so enormous a quantity of notes, that three wagons were required for its transport. Law complained to the regent, and urged on his attention the mischief that would be done, if such an example found many imitators. The regent was but too well aware of it, and, sending for the Prince de Conti, ordered him, under penalty of his high displeasure, to refund to the bank two-thirds of the specie which he had withdrawn from it. The prince was forced to obey the despotic mandate. Happily for Law's credit, De Conti was an unpopular man: every body condemned his meanness and cupidity, and agreed that Law had been hardly treated. It is strange, however, that so narrow an escape should not have made both Law and the regent more anxious to restrict their issues. Others were soon found who imitated, from motives of distrust, the example which had been

set by De Conti in revenge. The more acute stockjobbers imagined justly that prices could not continue to rise for ever. Bourdon and La Richardière, renowned for their extensive operations in the funds, quietly and in small quantities at a time, converted their notes into specie, and sent it away to foreign countries. They also bought as much as they could conveniently carry of plate and expensive jewellery, and sent it secretly away to England or to Holland. Vermalet, a jobber, who sniffed the coming storm, procured gold and silver coin to the amount of nearly a million of livres, which he packed in a farmer's cart, and covered over with hay and cow-dung. He then disguised himself in the dirty smock-frock, or *blouse*, of a peasant, and drove his precious load in safety into Belgium. From thence he soon found means to transport it to Amsterdam.

Hitherto no difficulty had been experienced by any class in procuring specie for their wants. But this system could not long be carried on without causing a scarcity. The voice of complaint was heard on every side, and inquiries being instituted, the cause was soon discovered. The council debated long on the remedies to be taken, and Law, being called on for his advice, was of opinion, that an edict should be published, depreciating the value of coin five per cent below that of paper. The edict was published accordingly; but failing of its intended effect, was followed by another, in which the depreciation was increased to ten per cent. The payments of the bank were at the same time restricted to one hundred livres in gold, and ten in silver. All these measures were nugatory to restore confidence in the paper, though the restriction of cash payments within limits so extremely narrow kept up the credit of the bank.



LUCIFER'S NEW ROW-BARGE. ¹¹

Notwithstanding every effort to the contrary, the precious metals continued to be conveyed to England and Holland. The little coin that was left in the country was carefully treasured, or hidden until the scarcity became so great, that the operations of trade could no longer be carried on. In this emergency, Law hazarded the bold experiment of forbidding the use of specie altogether. In February 1720 an edict was published, which, instead of restoring the credit of the paper, as was intended, destroyed it irrecoverably, and drove the country to the very brink of revolution. By this famous edict it was forbidden to any person whatever to have more than five hundred livres (20*l.*) of coin in his possession, under pain of a heavy fine, and confiscation of the sums found. It was also forbidden to buy up jewellery, plate, and precious stones, and informers were encouraged

to make search for offenders, by the promise of one-half the amount they might discover. The whole country sent up a cry of distress at this unheard-of tyranny. The most odious persecution daily took place. The privacy of families was violated by the intrusion of informers and their agents. The most virtuous and honest were denounced for the crime of having been seen with a *louis d'or* in their possession. Servants betrayed their masters, one citizen became a spy upon his neighbour, and arrests and confiscations so multiplied, that the courts found a difficulty in getting through the immense increase of business thus occasioned. It was sufficient for an informer to say that he suspected any person of concealing money in his house, and immediately a search-warrant was granted. Lord Stair, the English ambassador, said, that it was now impossible to doubt of the sincerity of Law's conversion to the Catholic religion; he had established the *inquisition*, after having given abundant evidence of his faith in *transubstantiation*, by turning so much gold into paper.

Every epithet that popular hatred could suggest was showered upon the regent and the unhappy Law. Coin, to any amount above five hundred livres, was an illegal tender, and nobody would take paper if he could help it. No one knew to-day what his notes would be worth to-morrow. "Never," says Duclos, in his *Secret Memoirs of the Regency*, "was seen a more capricious government—never was a more frantic tyranny exercised by hands less firm. It is inconceivable to those who were witnesses of the horrors of those times, and who look back upon them now as on a dream, that a sudden revolution did not break out—that Law and the regent did not perish by a tragical death. They were both held in horror, but the people

confined themselves to complaints; a sombre and timid despair, a stupid consternation, had seized upon all, and men's minds were too vile even to be capable of a courageous crime." It would appear that, a one time, a movement of the people was organised. Seditious writings were posted up against the walls, and were sent, in hand-bills, to the houses of the most conspicuous people. One of them, given in the *Mémoires de la Régence*, was to the following effect:—"Sir and madam,—This is to give you notice that a St. Bartholomew's Day will be enacted again on Saturday and Sunday, if affairs do not alter. You are desired not to stir out, nor you, nor your servants. God preserve you from the flames! Give notice to your neighbours. Dated, Saturday, May 25th, 1720." The immense number of spies with which the city was infested rendered the people mistrustful of one another, and beyond some trifling disturbances made in the evening by an insignificant group, which was soon dispersed, the peace of the capital was not compromised.



The value of shares in the Louisiana, or Mississippi stock, had fallen very rapidly, and few indeed were found to believe the tales that had once been told of the immense wealth of that region. A last

effort was therefore tried to restore the public confidence in the Mississippi project. For this purpose, a general conscription of all the poor wretches in Paris was made by order of government. Upwards of six thousand of the very refuse of the population were impressed, as if in time of war, and were provided with clothes and tools to be embarked for New Orleans, to work in the gold mines alleged to abound there. They were paraded day after day through the streets with their pikes and shovels, and then sent off in small detachments to the out-ports to be shipped for America. Two-thirds of them never reached their destination, but dispersed themselves over the country, sold their tools for what they could get, and returned to their old course of life. In less than three weeks afterwards, one-half of them were to be found again in Paris. The manœuvre, however, caused a trifling advance in Mississippi stock. Many persons of superabundant gullibility believed that operations had begun in earnest in the new Golconda, and that gold and silver ingots would again be found in France.

In a constitutional monarchy some surer means would have been found for the restoration of public credit. In England, at a subsequent period, when a similar delusion had brought on similar distress, how different were the measures taken to repair the evil; but in France, unfortunately, the remedy was left to the authors of the mischief. The arbitrary will of the regent, which endeavoured to extricate the country, only plunged it deeper into the mire. All payments were ordered to be made in paper, and between the 1st of February and the end of May, notes were fabricated to the amount of upwards of 1500 millions of livres, or 60,000,000*l.* sterling. But the alarm once sounded, no art could make the people feel the slightest

confidence in paper which was not exchangeable into metal. M. Lambert, the president of the parliament of Paris, told the regent to his face that he would rather have a hundred thousand livres in gold or silver than five millions in the notes of his bank. When such was the general feeling, the superabundant issues of paper but increased the evil, by rendering still more enormous the disparity between the amount of specie and notes in circulation. Coin, which it was the object of the regent to depreciate, rose in value on every fresh attempt to diminish it. In February, it was judged advisable that the Royal Bank should be incorporated with the Company of the Indies. An edict to that effect was published and registered by the parliament. The state remained the guarantee for the notes of the bank, and no more were to be issued without an order in council. All the profits of the bank, since the time it had been taken out of Law's hands and made a national institution, were given over by the regent to the Company of the Indies. This measure had the effect of raising for a short time the value of the Louisiana and other shares of the company, but it failed in placing public credit on any permanent basis.

A council of state was held in the beginning of May, at which Law, D'Argenson (his colleague in the administration of the finances), and all the ministers were present. It was then computed that the total amount of notes in circulation was 2600 millions of livres, while the coin in the country was not quite equal to half that amount. It was evident to the majority of the council that some plan must be adopted to equalise the currency. Some proposed that the notes should be reduced to the value of the specie, while others proposed that the nominal value of the specie should be raised till it was on an

equality with the paper. Law is said to have opposed both these projects, but failing in suggesting any other, it was agreed that the notes should be depreciated one half. On the 21st of May, an edict was accordingly issued, by which it was decreed that the shares of the Company of the Indies, and the notes of the bank, should gradually diminish in value, till at the end of a year they should only pass current for one-half of their nominal worth. The parliament refused to register the edict—the greatest outcry was excited, and the state of the country became so alarming, that, as the only means of preserving tranquillity, the council of the regency was obliged to stultify its own proceedings, by publishing within seven days another edict, restoring the notes to their original value.

On the same day (the 27th of May) the bank stopped payment in specie. Law and D'Argenson were both dismissed from the ministry. The weak, vacillating, and cowardly regent threw the blame of all the mischief upon Law, who, upon presenting himself at the Palais Royal, was refused admittance. At nightfall, however, he was sent for, and admitted into the palace by a secret door,¹² when the regent endeavoured to console him, and made all manner of excuses for the severity with which in public he had been compelled to treat him. So capricious was his conduct, that, two days afterwards, he took him publicly to the opera, where he sat in the royal box alongside of the regent, who treated him with marked consideration in face of all the people. But such was the hatred against Law that the experiment had well nigh proved fatal to him. The mob assailed his carriage with stones just as he was entering his own door; and if the coachman had not made a sudden jerk into the court-yard, and the domestics closed the gate immediately, he would, in all probability, have been dragged

out and torn to pieces. On the following day, his wife and daughter were also assailed by the mob as they were returning in their carriage from the races. When the regent was informed of these occurrences he sent Law a strong detachment of Swiss guards, who were stationed night and day in the court of his residence. The public indignation at last increased so much, that Law, finding his own house, even with this guard, insecure, took refuge in the Palais Royal, in the apartments of the regent.

The Chancellor, D'Aguesseau, who had been dismissed in 1718 for his opposition to the projects of Law, was now recalled to aid in the restoration of credit. The regent acknowledged too late, that he had treated with unjustifiable harshness and mistrust one of the ablest, and perhaps the sole honest public man of that corrupt period. He had retired ever since his disgrace to his country house at Fresnes, where, in the midst of severe but delightful philosophic studies, he had forgotten the intrigues of an unworthy court. Law himself, and the Chevalier de Conflans, a gentleman of the regent's household, were despatched in a post-chaise with orders to bring the ex-chancellor to Paris along with them. D'Aguesseau consented to render what assistance he could, contrary to the advice of his friends, who did not approve that he should accept any recal to office of which Law was the bearer. On his arrival in Paris, five counsellors of the parliament were admitted to confer with the Commissary of Finance; and on the 1st of June an order was published abolishing the law which made it criminal to amass coin to the amount of more than five hundred livres. Every one was permitted to have as much specie as he pleased. In order that the bank-notes might be withdrawn, twenty-five millions of new notes were created, on the

security of the revenues of the city of Paris, at two-and-a-half per cent. The bank-notes withdrawn were publicly burned in front of the Hôtel de Ville. The new notes were principally of the value of ten livres each; and on the 10th of June the bank was re-opened, with a sufficiency of silver coin to give in change for them.



D'AGUESSEAU.

These measures were productive of considerable advantage. All the population of Paris hastened to the bank to get coin for their small notes; and silver becoming scarce, they were paid in copper. Very few complained that this was too heavy, although poor fellows might be continually seen toiling and sweating along the streets, laden with more than they could comfortably carry, in the shape of change for fifty livres. The crowds around the bank were so great, that hardly a day passed that some one was not pressed to death. On the 9th of July, the multitude was so dense and clamorous that the guards stationed at the entrance of the Mazarin Gardens closed the gate and refused to admit any more. The crowd became incensed, and flung stones through the railings upon the soldiers. The latter, incensed in their turn, threatened to fire upon the people. At that instant one of them was hit by a stone, and, taking up his piece, he fired into the crowd. One man fell dead immediately, and another was severely wounded. It was every instant expected that a general attack would

have been commenced upon the bank; but the gates of the Mazarin Gardens being opened to the crowd, who saw a whole troop of soldiers, with their bayonets fixed ready to receive them, they contented themselves by giving vent to their indignation in groans and hisses.

Eight days afterwards the concourse of people was so tremendous that fifteen persons were squeezed to death at the doors of the bank. The people were so indignant that they took three of the bodies on stretchers before them, and proceeded, to the number of seven or eight thousand, to the gardens of the Palais Royal, that they might shew the regent the misfortunes that he and Law had brought upon the country. Law's coachman, who was sitting at the box of his master's carriage, in the court-yard of the palace, happened to have more zeal than discretion, and, not liking that the mob should abuse his master, he said, loud enough to be overheard by several persons, that they were all blackguards, and deserved to be hanged. The mob immediately set upon him, and thinking that Law was in the carriage, broke it to pieces. The imprudent coachman narrowly escaped with his life. No further mischief was done; a body of troops making their appearance, the crowd quietly dispersed, after an assurance had been given by the regent that the three bodies they had brought to shew him should be decently buried at his own expense. The parliament was sitting at the time of this uproar, and the president took upon himself to go out and see what was the matter. On his return he informed the councillors that Law's carriage had been broken by the mob. All the members rose simultaneously, and expressed their joy by a loud shout, while one man, more zealous

in his hatred than the rest, exclaimed, “*And Law himself, is he torn to pieces?*”¹³

Much, undoubtedly, depended on the credit of the Company of the Indies, which was answerable for so great a sum to the nation. It was therefore suggested in the council of the ministry, that any privileges which could be granted to enable it to fulfil its engagements, would be productive of the best results. With this end in view, it was proposed that the exclusive privilege of all maritime commerce should be secured to it, and an edict to that effect was published. But it was unfortunately forgotten that by such a measure all the merchants of the country would be ruined. The idea of such an immense privilege was generally scouted by the nation, and petition on petition was presented to the parliament that they would refuse to register the decree. They refused accordingly, and the regent, remarking that they did nothing but fan the flame of sedition, exiled them to Blois. At the intercession of D’Aguesseau, the place of banishment was changed to Pontoise, and thither accordingly the councillors repaired, determined to set the regent at defiance. They made every arrangement for rendering their temporary exile as agreeable as possible. The president gave the most elegant suppers, to which he invited all the gayest and wittiest company of Paris. Every night there was a concert and ball for the ladies. The usually grave and solemn judges and councillors joined in cards and other diversions, leading for several weeks a life of the most extravagant pleasure, for no other purpose than to shew the regent of how little consequence they deemed their banishment, and that, when they willed it, they could make Pontoise a pleasanter residence than Paris.

Of all the nations in the world the French are the most renowned for singing over their grievances. Of that country it has been remarked with some truth, that its whole history may be traced in its songs. When Law, by the utter failure of his best-laid plans, rendered himself obnoxious, satire of course seized hold upon him; and while caricatures of his person appeared in all the shops, the streets resounded with songs, in which neither he nor the regent was spared. Many of these songs were far from decent; and one of them in particular counselled the application of all his notes to the most ignoble use to which paper can be applied. But the following, preserved in the letters of the Duchess of Orleans, was the best and the most popular, and was to be heard for months in all the *carrefours* in Paris. The application of the chorus is happy enough:

Aussitôt que Lass arriva
Dans notre bonne ville,
Monsieur le Régent publia
Que Lass serait utile
Pour rétablir la nation.

La faridondaine! la faridondon!

Mais il nous a tous enrichi,

Biribi!

A la façon de Barbari,

Mon ami!

Ce parpaillot, pour attirer
Tout l'argent de la France,
Songea d'abord à s'assurer

De notre confiance.
Il fit son abjuration,
La faridondaine! la faridondon!
Mais le fourbe s'est converti,
Biribi!
A la façon de Barbari,
Mon ami!

Lass, le fils aîné de Satan
Nous met tous à l'aumône,
Il nous a pris tout notre argent
Et n'en rend à personne.
Mais le Régent, humain et bon,
La faridondaine! la faridondon!
Nous rendra ce qu'on nous a pris,
Biribi!
A la façon de Barbari,
Mon ami!

The following epigram is of the same date:

Lundi, j'achetai des actions;
Mardi, je gagnai des millions;
Mercredi, j'arrangeai mon ménage,
Jeudi, je pris un équipage,
Vendredi, je m'en fus au bal,
Et Samedi, à l'hôpital.

Among the caricatures that were abundantly published, and that shewed as plainly as graver matters, that the nation had awakened to a sense of its folly, was one, a fac-simile of which is preserved in the *Mémoires de la Régence*. It was thus described by its author: “The ‘Goddess of Shares,’ in her triumphal car, driven by the Goddess of Folly. Those who are drawing the car are impersonations of the Mississippi, with his wooden leg, the South Sea, the Bank of England, the Company of the West of Senegal, and of various assurances. Lest the car should not roll fast enough, the agents of these companies, known by their long fox-tails and their cunning looks, turn round the spokes of the wheels, upon which are marked the names of the several stocks and their value, sometimes high and sometimes low, according to the turns of the wheel. Upon the ground are the merchandise, day-books and ledgers of legitimate commerce, crushed under the chariot of Folly. Behind is an immense crowd of persons, of all ages, sexes, and conditions, clamoring after Fortune, and fighting with each other to get a portion of the shares which she distributes so bountifully among them. In the clouds sits a demon, blowing bubbles of soap, which are also the objects of the admiration and cupidity of the crowd, who jump upon one another’s backs to reach them ere they burst. Right in the pathway of the car, and blocking up the passage, stands a large building, with three doors, through one of which it must pass, if it proceeds farther, and all the crowd along with it. Over the first door are the words, ‘*Hôpital des Foux*,’ over the second, ‘*Hôpital des Malades*,’ and over the third, ‘*Hôpital des Gueux*.’” Another caricature represented Law sitting in a large cauldron, boiling over the flames of popular madness, surrounded by an impetuous multitude, who were pouring all their

gold and silver into it, and receiving gladly in exchange the bits of paper which he distributed among them by handfuls.

While this excitement lasted, Law took good care not to expose himself unguarded in the streets. Shut up in the apartments of the regent, he was secure from all attack; and whenever he ventured abroad, it was either *incognito*, or in one of the royal carriages, with a powerful escort. An amusing anecdote is recorded of the detestation in which he was held by the people, and the ill-treatment he would have met had he fallen into their hands. A gentleman of the name of Boursel was passing in his carriage down the Rue St. Antoine, when his farther progress was stayed by a hackney-coach that had blocked up the road. M. Boursel's servant called impatiently to the hackney-coachman to get out of the way, and, on his refusal, struck him a blow on the face. A crowd was soon drawn together by the disturbance, and M. Boursel got out of the carriage to restore order. The hackney-coachman, imagining that he had now another assailant, bethought him of an expedient to rid himself of both, and called out as loudly as he was able, "Help! help! murder! murder! Here are Law and his servant going to kill me! Help! help!" At this cry the people came out of their shops, armed with sticks and other weapons, while the mob gathered stones to inflict summary vengeance upon the supposed financier. Happily for M. Boursel and his servant, the door of the church of the Jesuits stood wide open, and, seeing the fearful odds against them, they rushed towards it with all speed. They reached the altar, pursued by the people, and would have been ill-treated even there, if, finding the door open leading to the sacristy, they had not sprang through, and closed it after them. The mob were then persuaded to leave the church by the

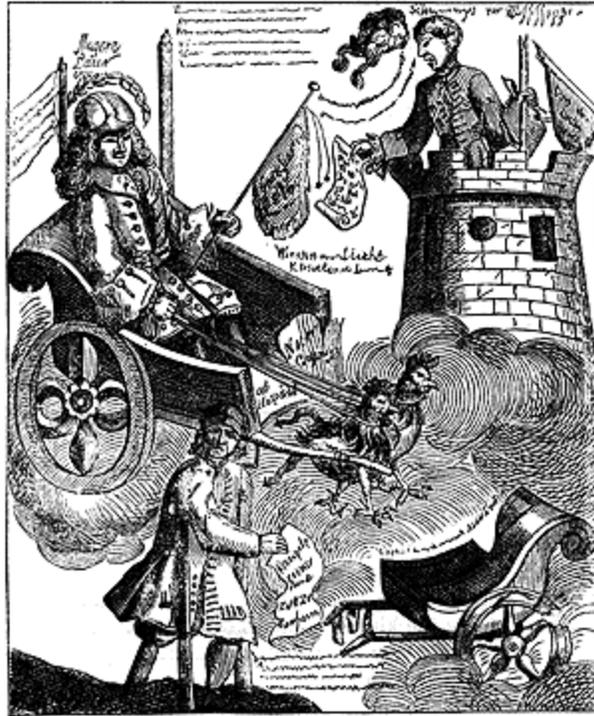
alarmed and indignant priests, and finding M. Boursel's carriage still in the streets, they vented their ill-will against it, and did it considerable damage.

The twenty-five millions secured on the municipal revenues of the city of Paris, bearing so low an interest as two and a half per cent, were not very popular among the large holders of Mississippi stock. The conversion of the securities was, therefore, a work of considerable difficulty; for many preferred to retain the falling paper of Law's Company, in the hope that a favourable turn might take place. On the 15th of August, with a view to hasten the conversion, an edict was passed, declaring that all notes for sums between one thousand and ten thousand livres, should not pass current, except for the purchase of annuities and bank accounts, or for the payment of instalments still due on the shares of the company.

In October following another edict was passed, depriving these notes of all value whatever after the month of November next ensuing. The management of the mint, the farming of the revenue, and all the other advantages and privileges of the India, or Mississippi Company, were taken from them, and they were reduced to a mere private company. This was the death-blow to the whole system, which had now got into the hands of its enemies. Law had lost all influence in the Council of Finance, and the company, being despoiled of its immunities, could no longer hold out the shadow of a prospect of being able to fulfil its engagements. All those suspected of illegal profits at the time the public delusion was at its height, were sought out and amerced in heavy fines. It was previously ordered that a list of the original proprietors should be made out, and that such persons as still retained their shares should place them in

deposit with the company, and that those who had neglected to complete the shares for which they had put down their names, should now purchase them of the company, at the rate of 13,500 livres for each share of 500 livres. Rather than submit to pay this enormous sum for stock which was actually at a discount, the shareholders packed up all their portable effects, and endeavoured to find a refuge in foreign countries. Orders were immediately issued to the authorities at the ports and frontiers, to apprehend all travellers who sought to leave the kingdom, and keep them in custody, until it was ascertained whether they had any plate or jewellery with them, or were concerned in the late stock-jobbing. Against such few as escaped, the punishment of death was recorded, while the most arbitrary proceedings were instituted against those who remained.

Law himself, in a moment of despair, determined to leave a country where his life was no longer secure. He at first only demanded permission to retire from Paris to one of his country-seats—a permission which the regent cheerfully granted. The latter was much affected at the unhappy turn affairs had taken, but his faith continued unmoved in the truth and efficacy of Law's financial system. His eyes were opened to his own errors; and during the few remaining years of his life he constantly longed for an opportunity of again establishing the system upon a securer basis. At Law's last interview with the prince, he is reported to have said,—“I confess that I have committed many faults. I committed them because I am a man, and all men are liable to error; but I declare to you most solemnly that none of them proceeded from wicked or dishonest motives, and that nothing of the kind will be found in the whole course of my conduct.”



LAW IN A CAR DRAWN BY COCKS. ¹⁴

Two or three days after his departure the regent sent him a very kind letter, permitting him to leave the kingdom whenever he pleased, and stating that he had ordered his passports to be made ready. He at the same time offered him any sum of money he might require. Law respectfully declined the money, and set out for Brussels in a post-chaise belonging to Madame de Prie, the mistress of the Duke of Bourbon, escorted by six horse-guards. From thence he proceeded to Venice, where he remained for some months, the object of the greatest curiosity to the people, who believed him to be the possessor of enormous wealth. No opinion, however, could be more erroneous. With more generosity than could have been

expected from a man who during the greatest part of his life had been a professed gambler, he had refused to enrich himself at the expense of a ruined nation. During the height of the popular frenzy for Mississippi stock, he had never doubted of the final success of his projects in making France the richest and most powerful nation of Europe. He invested all his gains in the purchase of landed property in France—a sure proof of his own belief in the stability of his schemes. He had hoarded no plate or jewellery, and sent no money, like the dishonest jobbers, to foreign countries. His all, with the exception of one diamond, worth about five or six thousand pounds sterling, was invested in the French soil; and when he left that country, he left it almost a beggar. This fact alone ought to rescue his memory from the charge of knavery, so often and so unjustly brought against him.

As soon as his departure was known, all his estates and his valuable library were confiscated. Among the rest, an annuity of 200,000 livres (8000*l.* sterling) on the lives of his wife and children, which had been purchased for five millions of livres, was forfeited, notwithstanding that a special edict, drawn up for the purpose in the days of his prosperity, had expressly declared that it should never be confiscated for any cause whatever. Great discontent existed among the people that Law had been suffered to escape. The mob and the parliament would have been pleased to have seen him hanged. The few who had not suffered by the commercial revolution rejoiced that the *quack* had left the country; but all those (and they were by far the most numerous class) whose fortunes were implicated regretted that his intimate knowledge of the distress of the country, and of the

causes that had led to it, had not been rendered more available in discovering a remedy.

At a meeting of the Council of Finance and the General Council of the Regency, documents were laid upon the table, from which it appeared that the amount of notes in circulation was 2700 millions. The regent was called upon to explain how it happened that there was a discrepancy between the dates at which these issues were made and those of the edicts by which they were authorised. He might have safely taken the whole blame upon himself, but he preferred that an absent man should bear a share of it; and he therefore stated that Law, upon his own authority, had issued 1200 millions of notes at different times, and that he (the regent), seeing that the thing had been irrevocably done, had screened Law by antedating the decrees of the council which authorised the augmentation. It would have been more to his credit if he had told the whole truth while he was about it, and acknowledged that it was mainly through his extravagance and impatience that Law had been induced to overstep the bounds of safe speculation. It was also ascertained that the national debt, on the 1st of January 1721, amounted to upwards of 3100 millions of livres, or more than 124,000,000*l.* sterling, the interest upon which was 3,196,000*l.* A commission, or *visa*, was forthwith appointed to examine into all the securities of the state creditors, who were to be divided into five classes; the first four comprising those who had purchased their securities with real effects, and, the latter comprising those who could give no proofs that the transactions they had entered into were real and *bonâ fide*. The securities of the latter were ordered to be destroyed, while those of the first four classes were subjected to a

most rigid and jealous scrutiny. The result of the labours of the *visa*, was a report, in which they counselled the reduction of the interest upon these securities to fifty-six millions of livres. They justified, this, advice by a statement of the various acts of speculation and extortion which they had discovered; and an edict to that effect was accordingly published and duly registered by the parliaments of the kingdom.



D'ARGENSON.

Another tribunal was afterwards established, under the title of the *Chambre de l'Arsenal*, which took cognisance of all the malversations committed in the financial departments of the government, during the late unhappy period. A Master of Requests, named Falhonet, together with the Abbé Clement, and two clerks in their employ, had been concerned in divers acts of speculation to the amount of upwards of a million of livres. The first two were sentenced to be beheaded, and the latter to be hanged; but their punishment was afterwards commuted into imprisonment for life in the Bastille. Numerous other acts of dishonesty were discovered, and punished, by fine and imprisonment.

D'Argenson shared with Law and the regent the unpopularity which had alighted upon all those concerned in the Mississippi

madness. He was dismissed from his post of Chancellor to make room for D'Aguesseau; but he retained the title of Keeper of the Seals, and was allowed to attend the councils whenever he pleased. He thought it better, however, to withdraw from Paris, and live for a time a life of seclusion at his country-seat. But he was not formed for retirement; and becoming moody and discontented, he aggravated a disease under which he had long laboured, and died in less than a twelve-month. The populace of Paris so detested him, that they carried their hatred even to his grave. As his funeral procession passed to the church of St. Nicholas du Chardonneret, the burying-place of his family, it was beset by a riotous mob, and his two sons, who were following as chief mourners, were obliged to drive as fast as they were able down a by-street to escape personal violence.

As regards Law, he for some time entertained a hope that he should be recalled to France, to aid in establishing its credit upon a firmer basis. The death of the regent in 1723, who expired suddenly as he was sitting by the fireside conversing with his mistress, the Duchess de Phalaris, deprived him of that hope, and he was reduced to lead his former life of gambling. He was more than once obliged to pawn his diamond, the sole remnant of his vast wealth, but successful play generally enabled him to redeem it. Being persecuted by his creditors at Rome, he proceeded to Copenhagen, where he received permission from the English ministry to reside in his native country, his pardon for the murder of Mr. Wilson having been sent over to him in 1719. He was brought over in the admiral's ship—a circumstance which gave occasion for a short debate in the House of Lords. Earl Coningsby complained that a man who had renounced both his country and his religion, should have been treated with such

honour, and expressed his belief that his presence in England, at a time when the people were so bewildered by the nefarious practices of the South-Sea directors, would be attended with no little danger. He gave notice of a motion on the subject; but it was allowed to drop, no other member of the House having the slightest participation in his lordship's fears. Law remained for about four years in England, and then proceeded to Venice, where he died in 1729, in very embarrassed circumstances. The following epitaph was written at the time:

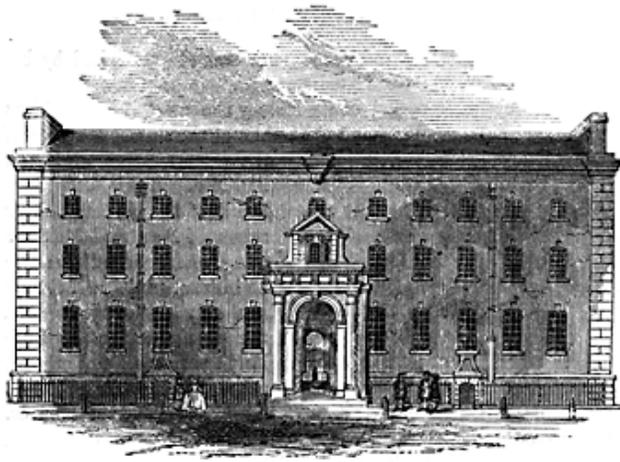
“Ci gît cet Ecosais célèbre,
Ce calculateur sans égal,
Qui, par les règles de l'algèbre,
A mis la France à l'hôpital.”

His brother, William Law, who had been concerned with him in the administration both of the bank and the Louisiana Company, was imprisoned in the Bastille for alleged malversation, but no guilt was ever proved against him. He was liberated after fifteen months, and became the founder of a family, which is still known in France under the title of Marquises of Lauriston.



NECK OR NOTHING. ¹⁵

In the next chapter will be found an account of the madness which infected the people of England at the same time, and under very similar circumstances, but which, thanks to the energies and good sense of a constitutional government, was attended with results far less disastrous than those which were seen in France.



SOUTH-SEA HOUSE.

THE SOUTH-SEA BUBBLE.

At length corruption, like a general flood,
Did deluge all; and avarice creeping on,
Spread, like a low-born mist, and hid the sun.
Statesmen and patriots plied alike the stocks,
Peeress and butler shared alike the box;
And judges jobbed, and bishops bit the town,
And mighty dukes packed cards for half-a-crown:
Britain was sunk in lucre's sordid charms.—*Pope.*

THE South-Sea Company was originated by the celebrated Harley Earl of Oxford, in the year 1711, with the view of restoring public credit, which had suffered by the dismissal of the Whig ministry, and of providing for the discharge of the army and navy debentures, and other parts of the floating debt, amounting to nearly ten millions sterling. A company of merchants, at that time without a name, took this debt upon themselves, and the government agreed to secure them for a certain period the interest of six per cent. To provide for this interest, amounting to 600,000*l.* per annum, the duties upon wines, vinegar, India goods, wrought silks, tobacco, whale-fins, and some other articles, were rendered permanent. The monopoly of the trade to the South Seas was granted, and the company, being incorporated by act of parliament, assumed the title by which it has ever since been known. The minister took great credit to himself for his share in this transaction, and the scheme was always called by his flatterers “the Earl of Oxford’s masterpiece.”



HARLEY EARL OF OXFORD

Even at this early period of its history the most visionary ideas were formed by the company and the public of the immense riches of the eastern coast of South America. Every body had heard of the gold and silver mines of Peru and Mexico; every one believed them to be inexhaustible, and that it was only necessary to send the manufactures of England to the coast to be repaid a hundred fold in gold and silver ingots by the natives. A report, industriously spread, that Spain was willing to concede four ports on the coasts of Chili and Peru for the purposes of traffic, increased the general confidence, and for many years the South-Sea Company's stock was in high favour.

Philip V. of Spain, however, never had any intention of admitting the English to a free trade in the ports of Spanish America. Negotiations were set on foot, but their only result was the *assiento* contract, or the privilege of supplying the colonies with negroes for thirty years, and of sending once a year a vessel, limited both as to tonnage and value of cargo, to trade with Mexico, Peru, or Chili. The latter permission was only granted upon the hard condition, that the King of Spain should enjoy one-fourth of the profits, and a tax of five per cent on the remainder. This was a great disappointment to the Earl of Oxford and his party, who were reminded much oftener than they found agreeable of the

“Parturiunt montes, nascitur ridiculus mus.”

But the public confidence in the South-Sea Company was not shaken. The Earl of Oxford declared that Spain would permit two ships, in addition to the annual ship, to carry out merchandise during the first year; and a list was published, in which all the ports and harbours of these coasts were pompously set forth as open to the trade of Great Britain. The first voyage of the annual ship was not made till the year 1717, and in the following year the trade was suppressed by the rupture with Spain.

The king's speech, at the opening of the session of 1717, made pointed allusion to the state of public credit, and recommended that proper measures should be taken to reduce the national debt. The two great monetary corporations, the South-Sea Company and the Bank of England, made proposals to parliament on the 20th of May ensuing. The South-Sea Company prayed that their capital stock of ten millions might be increased to twelve, by subscription or otherwise, and offered to accept five per cent instead of six upon the whole amount. The bank made proposals equally advantageous. The house debated for some time, and finally three acts were passed, called the South-Sea Act, the Bank Act, and the General Fund Act. By the first, the proposals of the South-Sea Company were accepted, and that body held itself ready to advance the sum of two millions towards discharging the principal and interest of the debt due by the state for the four lottery funds, of the ninth and tenth years of Queen Anne. By the second act, the bank received a lower rate of interest for the sum of 1,775,027*l.* 15*s.* due to it by the state, and agreed to deliver up to be cancelled as many exchequer bills as amounted to two millions sterling, and to accept of an annuity of one hundred thousand pounds, being after the rate of five per cent, the whole redeemable at one year's notice. They were further required to be ready to advance, in case of need, a sum not exceeding 2,500,000*l.* upon the same terms of five per cent interest, redeemable by parliament. The General Fund Act recited the various deficiencies, which were to be made good by the aids derived from the foregoing sources.

The name of the South-Sea Company was thus continually before the public. Though their trade with the South American States produced little or no augmentation of their revenues, they continued to flourish as a monetary corporation. Their stock was in high request, and the directors, buoyed up with success, began to think of new means for extending their influence. The Mississippi scheme of John Law, which so dazzled and captivated the French people, inspired them with an idea that they could carry on the same game in England. The anticipated failure of his plans did not divert them from their intention. Wise in their own conceit, they imagined they could avoid his faults, carry on their schemes for ever, and stretch the cord of credit to its extremest tension, without causing it to snap asunder.

It was while Law's plan was at its greatest height of popularity, while people were crowding in thousands to the Rue Quincampoix, and ruining themselves with frantic eagerness, that the South-Sea directors laid before parliament their famous plan for paying off the national debt. Visions of boundless wealth floated before the fascinated eyes of the people in the two most celebrated countries of Europe. The English commenced their career of extravagance somewhat later than the French; but as soon as the delirium seized them, they were determined not to be outdone. Upon the 22d of January, 1720, the House of Commons resolved itself into a committee of the whole house, to take into consideration that part of the king's speech at the opening of the session which related to the public debts, and the proposal of the South-Sea Company towards the redemption and sinking of the same. The proposal set forth at great length, and under several heads, the debts of the state, amounting to 30,981,712*l.*, which the company were anxious to take upon themselves, upon consideration of five per cent per annum, secured to them until Midsummer 1727; after which time, the whole was to become redeemable at the pleasure of the legislature, and the interest to be reduced to four per cent. The proposal was received with great favour; but the Bank of England had many friends

in the House of Commons, who were desirous that that body should share in the advantages that were likely to accrue. On behalf of this corporation it was represented, that they had performed great and eminent services to the state in the most difficult times, and deserved, at least, that if any advantage was to be made by public bargains of this nature, they should be preferred before a company that had never done any thing for the nation. The further consideration of the matter was accordingly postponed for five days. In the mean time, a plan was drawn up by the governors of the bank. The South-Sea Company, afraid that the bank might offer still more advantageous terms to the government than themselves, reconsidered their former proposal, and made some alterations in it, which they hoped would render it more acceptable. The principal change was a stipulation that the government might redeem these debts at the expiration of four years, instead of seven, as at first suggested. The bank resolved not to be outbidden in this singular auction, and the governors also reconsidered their first proposal, and sent in a new one.

Thus, each corporation having made two proposals, the house began to deliberate. Mr. Robert Walpole was the chief speaker in favour of the bank, and Mr. Aislalie, the Chancellor of the Exchequer, the principal advocate on behalf of the South-Sea Company. It was resolved, on the 2d of February, that the proposals of the latter were most advantageous to the country. They were accordingly received, and leave was given to bring in a bill to that effect.

Exchange Alley was in a fever of excitement. The company's stock, which had been at a hundred and thirty the previous day, gradually rose to three hundred, and continued to rise with the most astonishing rapidity during the whole time that the bill in its several stages was under discussion. Mr. Walpole was almost the only statesman in the House who spoke out boldly against it. He warned them, in eloquent and solemn language, of the evils that would ensue. It countenanced, he said, "the dangerous practice of stock-jobbing, and would divert the genius of the nation from trade and

industry. It would hold out a dangerous lure to decoy the unwary to their ruin, by making them part with the earnings of their labour for a prospect of imaginary wealth. The great principle of the project was an evil of first-rate magnitude; it was to raise artificially the value of the stock, by exciting and keeping up a general infatuation, and by promising dividends out of funds which could never be adequate to the purpose.” In a prophetic spirit he added, that if the plan succeeded, the directors would become masters of the government, form a new and absolute aristocracy in the kingdom, and control the resolutions of the legislature. If it failed, which he was convinced it would, the result would bring general discontent and ruin upon the country. Such would be the delusion, that when the evil day came, as come it would, the people would start up, as from a dream, and ask themselves if these things could have been true. All his eloquence was in vain. He was looked upon as a false prophet, or compared to the hoarse raven, croaking omens of evil. His friends, however, compared him to Cassandra, predicting evils which would only be believed when they came home to men’s hearths, and stared them in the face at their own boards. Although, in former times, the house had listened with the utmost attention to every word that fell from his lips, the benches became deserted when it was known that he would speak on the South-Sea question.



SIR ROBERT WALPOLE

The bill was two months in its progress through the House of Commons. During this time every exertion was made by the directors and their friends, and more especially by the chairman, the noted Sir John Blunt, to

raise the price of the stock. The most extravagant rumours were in circulation. Treaties between England and Spain were spoken of, whereby the latter was to grant a free trade to all her colonies; and the rich produce of the mines of Potosi-la-Paz was to be brought to England until silver should become almost as plentiful as iron. For cotton and woollen goods, with which we could supply them in abundance, the dwellers in Mexico were to empty their golden mines. The company of merchants trading to the South Seas would be the richest the world ever saw, and every hundred pounds invested in it would produce hundreds per annum to the stockholder. At last the stock was raised by these means to near four hundred; but, after fluctuating a good deal, settled at three hundred and thirty, at which price it remained when the bill passed the Commons by a majority of 172 against 55.

In the House of Lords the bill was hurried through all its stages with unexampled rapidity. On the 4th of April it was read a first time; on the 5th, it was read a second time; on the 6th, it was committed; and on the 7th, was read a third time and passed.

Several peers spoke warmly against the scheme; but their warnings fell upon dull, cold ears. A speculating frenzy had seized them as well as the plebeians. Lord North and Grey said the bill was unjust in its nature, and might prove fatal in its consequences, being calculated to enrich the few and impoverish the many. The Duke of Wharton followed; but, as he only retailed at second-hand the arguments so eloquently stated by Walpole in the Lower House, he was not listened to with even the same attention that had been bestowed upon Lord North and Grey. Earl Cowper followed on the same side, and compared the bill to the famous horse of the siege of Troy. Like that, it was ushered in and received with great pomp and acclamations of joy, but bore within it treachery and destruction. The Earl of Sunderland endeavoured to answer all objections; and on the question being put, there appeared only seventeen peers against, and eighty-three in

favour of the project. The very same day on which it passed the Lords, it received the royal assent, and became the law of the land.

It seemed at that time as if the whole nation had turned stockjobbers. Exchange Alley was every day blocked up by crowds, and Cornhill was impassable for the number of carriages. Every body came to purchase stock. "Every fool aspired to be a knave." In the words of a ballad published at the time, and sung about the streets,¹⁶

"Then stars and garters did appear
Among the meaner rabble;
To buy and sell, to see and hear
The Jews and Gentiles squabble.

The greatest ladies thither came,
And plied in chariots daily,
Or pawned their jewels for a sum
To venture in the Alley."

The inordinate thirst of gain that had afflicted all ranks of society was not to be slaked even in the South Sea. Other schemes, of the most extravagant kind, were started. The share-lists were speedily filled up, and an enormous traffic carried on in shares, while, of course, every means were resorted to to raise them to an artificial value in the market.



CORNHILL, 1720.

Contrary to all expectation, South-Sea stock fell when the bill received the royal assent. On the 7th of April the shares were quoted at three hundred and ten, and on the following day at two hundred and ninety. Already the directors had tasted the profits of their scheme, and it was not likely that they should quietly allow the stock to find its natural level without an effort to raise it. Immediately their busy emissaries were set to work. Every person interested in the success of the project endeavoured to draw a knot of listeners around him, to whom he expatiated on the treasures of the South American seas. Exchange Alley was crowded with attentive groups. One rumour alone, asserted with the utmost confidence, had an immediate effect upon the stock. It was said that Earl Stanhope had received overtures in France from the Spanish government to exchange Gibraltar and Port Mahon for some places on the coast of Peru, for the security and enlargement of the trade in the South Seas. Instead of one annual ship trading to those ports, and allowing the king of Spain twenty-five per cent out of the profits, the company might build and charter as many ships as they pleased, and pay no per centage whatever to any foreign potentate.

“Visions of ingots danced before their eyes,”

and stock rose rapidly. On the 12th of April, five days after the bill had become law, the directors opened their books for a subscription of a million, at the rate of 300*l.* for every 100*l.* capital. Such was the concourse of persons of all ranks, that this first subscription was found to amount to above two millions of original stock. It was to be paid at five payments, of 60*l.* each for every 100*l.* In a few days the stock advanced to three hundred and forty, and the subscriptions were sold for double the price of the first payment. To raise the stock still higher, it was declared, in a general court of directors, on the 21st of April, that the midsummer dividend should be ten per cent, and that all subscriptions should be entitled to the same. These resolutions answering the end designed, the directors, to improve the infatuation of the monied men, opened their books for a second subscription of a million, at four hundred per cent. Such was the frantic eagerness of people of every class to speculate in these funds, that in the course of a few hours no less than a million and a half was subscribed at that rate.

In the mean time, innumerable joint-stock companies started up every where. They soon received the name of Bubbles, the most appropriate that imagination could devise. The populace are often most happy in the nicknames they employ. None could be more apt than that of Bubbles. Some of them lasted for a week or a fortnight, and were no more heard of, while others could not even live out that short span of existence. Every evening produced new schemes, and every morning new projects. The highest of the aristocracy were as eager in this hot pursuit of gain as the most plodding jobber in Cornhill. The Prince of Wales became governor of one company, and is said to have cleared 40,000*l.* by his speculations.¹⁷ The Duke of Bridgewater started a scheme for the improvement of London and Westminster, and the Duke of Chandos another. There were nearly a hundred different projects, each more extravagant and deceptive than the other, To use the words of the *Political State*, they were “set on foot and promoted by crafty knaves, then pursued by multitudes of covetous fools,

and at last appeared to be, in effect, what their vulgar appellation denoted them to be—bubbles and mere cheats.” It was computed that near one million and a half sterling was won and lost by these unwarrantable practices, to the impoverishment of many a fool, and the enriching of many a rogue.

Some of these schemes were plausible enough, and, had they been undertaken at a time when the public mind was unexcited, might have been pursued with advantage to all concerned. But they were established merely with the view of raising the shares in the market. The projectors took the first opportunity of a rise to sell out, and next morning the scheme was at an end. Maitland, in his *History of London*, gravely informs us, that one of the projects which received great encouragement, was for the establishment of a company “to make deal boards out of saw-dust.” This is no doubt intended as a joke; but there is abundance of evidence to shew that dozens of schemes, hardly a whit more reasonable, lived their little day, ruining hundreds ere they fell. One of them was for a wheel for perpetual motion—capital one million; another was “for encouraging the breed of horses in England, and improving of glebe and church lands, and repairing and rebuilding parsonage and vicarage houses.” Why the clergy, who were so mainly interested in the latter clause, should have taken so much interest in the first, is only to be explained on the supposition that the scheme was projected by a knot of the fox-hunting parsons, once so common in England. The shares of this company were rapidly subscribed for. But the most absurd and preposterous of all, and which shewed, more completely than any other, the utter madness of the people, was one started by an unknown adventurer, entitled “*A company for carrying on an undertaking of great advantage, but nobody to know what it is.*” Were not the fact stated by scores of credible witnesses, it would be impossible to believe that any person could have been duped by such a project. The man of genius who essayed this bold and successful inroad upon public credulity, merely stated in his prospectus that the required capital was half

a million, in five thousand shares of 100*l.* each, deposit 2*l.* per share. Each subscriber, paying his deposit, would be entitled to 100*l.* per annum per share. How this immense profit was to be obtained, he did not condescend to inform them at that time, but promised that in a month full particulars should be duly announced, and a call made for the remaining 98*l.* of the subscription. Next morning, at nine o'clock, this great man opened an office in Cornhill. Crowds of people beset his door, and when he shut up at three o'clock, he found that no less than one thousand shares had been subscribed for, and the deposits paid. He was thus, in five hours, the winner of 2000*l.* He was philosopher enough to be contented with his venture, and set off the same evening for the Continent. He was never heard of again.

Well might Swift exclaim, comparing Change Alley to a gulf in the South Sea:

“Subscribers here by thousands float,
And jostle one another down,
Each paddling in his leaky boat,
And here they fish for gold and drown.

Now buried in the depths below,
Now mounted up to heaven again,
They reel and stagger to and fro,
At their wit's end, like drunken men.

Meantime, secure on Garraway cliffs,
A savage race, by shipwrecks fed,
Lie waiting for the foundered skiffs,
And strip the bodies of the dead.”

Another fraud that was very successful was that of the “Globe *Permits*,” as they were called. They were nothing more than square pieces of playing-cards, on which was the impression of a seal, in wax, bearing the sign of the Globe Tavern, in the neighbourhood of Exchange Alley, with the inscription of “Sail-Cloth Permits.” The possessors enjoyed no other advantage from them than permission to subscribe at some future time to a new sail-cloth manufactory, projected by one who was then known to be a man of fortune, but who was afterwards involved in the speculation and punishment of the South-Sea directors. These permits sold for as much as sixty guineas in the Alley.

Persons of distinction, of both sexes, were deeply engaged in all these bubbles; those of the male sex going to taverns and coffee-houses to meet their brokers, and the ladies resorting for the same purpose to the shops of milliners and haberdashers. But it did not follow that all these people believed in the feasibility of the schemes to which they subscribed; it was enough for their purpose that their shares would, by stock-jobbing arts, be soon raised to a premium, when they got rid of them with all expedition to the really credulous. So great was the confusion of the crowd in the alley, that shares in the same bubble were known to have been sold at the same instant ten per cent higher at one end of the alley than at the other. Sensible men beheld the extraordinary infatuation of the people with sorrow and alarm. There were some both in and out of parliament who foresaw clearly the ruin that was impending. Mr. Walpole did not cease his gloomy forebodings. His fears were shared by all the thinking few, and impressed most forcibly upon the government. On the 11th of June, the day the parliament rose, the king published a proclamation, declaring that all these unlawful projects should be deemed public nuisances, and prosecuted accordingly, and forbidding any broker, under a penalty of five hundred pounds, from buying or selling any shares in them. Notwithstanding this proclamation, roguish speculators still carried them on, and the deluded people still encouraged them. On the 12th of July, an

order of the Lords Justices assembled in privy council was published, dismissing all the petitions that had been presented for patents and charters, and dissolving all the bubble companies. The following copy of their lordships' order, containing a list of all these nefarious projects, will not be deemed uninteresting at the present time, when, at periodic intervals, there is but too much tendency in the public mind to indulge in similar practices:

“At the Council Chamber, Whitehall, the 12th day of July,
1720. Present, their Excellencies the Lords Justices in
Council.

“Their Excellencies the Lords Justices, in council, taking into consideration the many inconveniences arising to the public from several projects set on foot for raising of joint-stock for various purposes, and that a great many of his majesty's subjects have been drawn in to part with their money on pretence of assurances that their petitions for patents and charters to enable them to carry on the same would be granted: to prevent such impositions, their excellencies this day ordered the said several petitions, together with such reports from the Board of Trade, and from his majesty's attorney and solicitor-general, as had been obtained thereon, to be laid before them; and after mature consideration thereof, were pleased, by advice of his majesty's privy council, to order that the said petitions be dismissed, which are as follow:

“1. Petition of several persons, praying letters patent for carrying on a fishing trade by the name of the Grand Fishery of Great Britain.

“2. Petition of the Company of the Royal Fishery of England, praying letters patent for such further powers as will effectually contribute to carry on the said fishery.

“3. Petition of George James, on behalf of himself and divers persons of distinction concerned in a national fishery, praying letters patent of incorporation, to enable them to carry on the same.

“4. Petition of several merchants, traders, and others, whose names are thereunto subscribed, praying to be incorporated for reviving and carrying on a whale fishery to Greenland and elsewhere.

“5. Petition of Sir John Lambert and others thereto subscribing, on behalf of themselves and a great number of merchants, praying to be incorporated for carrying on a Greenland trade, and particularly a whale fishery in Davis’s Straits.

“6. Another petition for a Greenland trade.

“7. Petition of several merchants, gentlemen, and citizens, praying to be incorporated for buying and building of ships to let or freight.

“8. Petition of Samuel Antrim and others, praying for letters patent for sowing hemp and flax.

“9. Petition of several merchants, masters of ships, sail-makers, and manufacturers of sail-cloth, praying a charter of incorporation, to enable them to carry on and promote the said manufactory by a joint-stock.

“10. Petition of Thomas Boyd and several hundred merchants, owners and masters of ships, sail-makers, weavers, and other traders, praying a charter of incorporation, empowering them to borrow money for purchasing lands, in order to the manufacturing sail-cloth and fine holland.

“11. Petition on behalf of several persons interested in a patent granted by the late King William and Queen Mary for the making of linen and sail-cloth, praying that no charter may be granted to any persons whatsoever for making sail-cloth, but that the privilege now enjoyed by them may be confirmed, and likewise an additional power to carry on the cotton and cotton-silk manufactures.

“12. Petition of several citizens, merchants, and traders in London, and others, subscribers to a British stock for a general insurance from fire in any part of England, praying to be incorporated for carrying on the said undertaking.

“13. Petition of several of his majesty’s loyal subjects of the city of London and other parts of Great Britain, praying to be incorporated for carrying on a general insurance from losses by fire within the kingdom of England.

“14. Petition of Thomas Surges and others his majesty’s subjects thereto subscribing, in behalf of themselves and others, subscribers to a fund of 1,200,000*l.* for carrying on a trade to his majesty’s German dominions, praying to be incorporated by the name of the Harburg Company.

“15. Petition of Edward Jones, a dealer in timber, on behalf of himself and others, praying to be incorporated for the importation of timber from Germany.

“16. Petition of several merchants of London, praying a charter of incorporation for carrying on a salt-work.

“17. Petition of Captain Macphedris of London, merchant, on behalf of himself and several merchants, clothiers, hatters, dyers, and other traders, praying a charter of incorporation empowering them to raise a sufficient sum of money to purchase lands for planting and rearing a wood called madder, for the use of dyers.

“18. Petition of Joseph Galendo of London, snuff-maker, praying a patent for his invention to prepare and cure Virginia tobacco for snuff in Virginia, and making it into the same in all his majesty’s dominions.”

List of Bubbles.

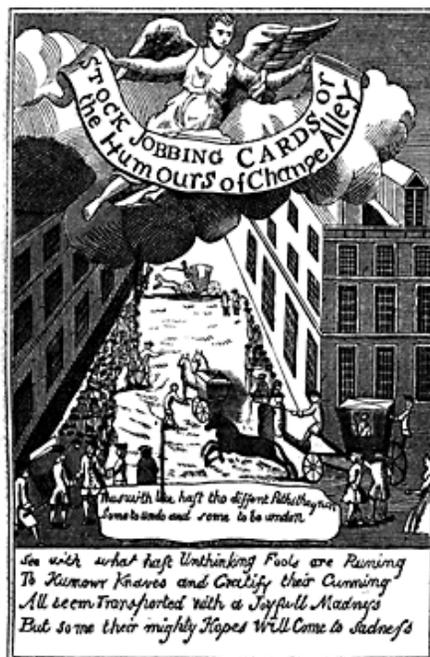
The following Bubble-Companies were by the same order declared to be illegal, and abolished accordingly:

1. For the importation of Swedish iron.
2. For supplying London with sea-coal. Capital, three millions.
3. For building and rebuilding houses throughout all England Capital, three millions.
4. For making of muslin.
5. For carrying on and improving the British alum-works.
6. For effectually settling the island of Blanco and Sal Tartagus.
7. For supplying the town of Deal with fresh water.
8. For the importation of Flanders lace.
9. For improvement of lands in Great Britain. Capital, four millions.
10. For encouraging the breed of horses in England, and improving of glebe and church lands, and for repairing and rebuilding parsonage and vicarage houses.
11. For making of iron and steel in Great Britain,
12. For improving the land in the county of Flint. Capital, one million.
13. For purchasing lands to build on. Capital, two millions.
14. For trading in hair.
15. For erecting salt-works in Holy Island. Capital, two millions.
16. For buying and selling estates, and lending money on mortgage.
17. For carrying on an undertaking of great advantage; but nobody to know what it is.
18. For paving the streets of London. Capital, two millions.
19. For furnishing funerals to any part of Great Britain.
20. For buying and selling lands and lending money at interest. Capital, five millions.
21. For carrying on the royal fishery of Great Britain. Capital, ten millions.
22. For assuring of seamen's wages.
23. For erecting loan-offices for the assistance and encouragement of the industrious. Capital, two millions.

24. For purchasing and improving leaseable lands. Capital, four millions.
25. For importing pitch and tar, and other naval stores, from North Britain and America.
26. For the clothing, felt, and pantile trade.
27. For purchasing and improving a manor and royalty in Essex.
28. For insuring of horses. Capital, two millions.
29. For exporting the woollen manufacture, and importing copper, brass, and iron. Capital, four millions.
30. For a grand dispensary. Capital, three millions.
31. For erecting mills and purchasing lead-mines. Capital, two millions.
32. For improving the art of making soap.
33. For a settlement on the island of Santa Cruz.
34. For sinking pits and smelting lead ore in Derbyshire.
35. For making glass bottles and other glass.
36. For a wheel for perpetual motion. Capital, one million.
37. For improving of gardens.
38. For insuring and increasing children's fortunes.
39. For entering and loading goods at the Custom-house, and for negotiating business for merchants.
40. For carrying on a woollen manufacture in the North of England.
41. For importing walnut-trees from Virginia, Capital, two millions.
42. For making Manchester stuffs of thread and cotton.
43. For making Joppa and Castile soap.
44. For improving the wrought-iron and steel manufactures of this kingdom. Capital four millions.
45. For dealing in lace, hollands, cambrics, lawns, &c. Capital, two millions.
46. For trading in and improving certain commodities of the produce of this kingdom, &c. Capital three millions.
47. For supplying the London markets with cattle.
48. For making looking-glasses, coach-glasses, &c. Capital, two millions.

49. For working the tin and lead mines in Cornwall and Derbyshire.
50. For making rape-oil.
51. For importing beaver fur. Capital, two millions.
52. For making pasteboard and packing-paper.
53. For importing of oils and other materials used in the woollen manufacture.
54. For improving and increasing the silk manufactures.
55. For lending money on stock, annuities, tallies, &c.
56. For paying pensions to widows and others, at a small discount. Capital, two millions.
57. For improving malt liquors. Capital, four millions.
58. For a grand American fishery.
59. For purchasing and improving the fenny lands in Lincolnshire. Capital, two millions.
60. For improving the paper manufacture of Great Britain.
61. The Bottomry Company.
62. For drying malt by hot air.
63. For carrying on a trade in the river Oronooko.
64. For the more effectual making of baize, in Colchester and other parts of Great Britain.
65. For buying of naval stores, supplying the victualling, and paying the wages of the workmen.
66. For employing poor artificers, and furnishing merchants and others with watches.
67. For improvement of tillage and the breed of cattle.
68. Another for the improvement of our breed in horses.
69. Another for a horse-insurance.
70. For carrying on the corn trade of Great Britain.
71. For insuring to all masters and mistresses the losses they may sustain by servants. Capital, three millions.
72. For erecting houses or hospitals for taking in and maintaining illegitimate children. Capital, two millions.

73. For bleaching coarse sugars, without the use of fire or loss of substance.
74. For building turnpikes and wharfs in Great Britain.
75. For insuring from thefts and robberies.
76. For extracting silver from lead.
77. For making china and delft ware. Capital, one million.
78. For importing tobacco, and exporting it again to Sweden and the north of Europe. Capital, four millions.
79. For making iron with pit coal.
80. For furnishing the cities of London and Westminster with hay and straw. Capital, three millions.
81. For a sail and packing-cloth manufactory in Ireland.
82. For taking up ballast.
83. For buying and fitting out ships to suppress pirates.
84. For the importation of timber from Wales. Capital, two millions.
85. For rock-salt.
86. For the transmutation of quicksilver into a malleable fine metal.



CHANGE-ALLEY.¹⁸

Besides these bubbles, many others sprang up daily, in spite of the condemnation of the government and the ridicule of the still sane portion of the public. The print-shops teemed with caricatures, and the newspapers with epigrams and satires, upon the prevalent folly. An ingenious cardmaker published a pack of South-Sea playing-cards, which are now extremely rare, each card containing, besides the usual figures, of a very small size, in one corner, a caricature of a bubble-company, with appropriate verses underneath. One of the most famous bubbles was "Puckle's Machine Company," for discharging round and square cannon-balls and bullets, and making a total revolution in the art of war. Its pretensions to public favour were thus summed up on the eight of spades:

"A rare invention to destroy the crowd
Of fools at home instead of fools abroad.
Fear not, my friends, this terrible machine,
They're only wounded who have shares therein."



TREE CARICATURE¹⁹

The nine of hearts was a caricature of the English Copper and Brass Company, with the following epigram:

“The headlong-fool that wants to be a swopper
Of gold and silver coin for English copper,
May, in Change Alley, prove himself an ass,
And give rich metal for adultrate brass.”

The eight of diamonds celebrated the company for the colonisation of Acadia, with this doggrel:

“He that is rich and wants to fool away
A good round sum in North America,
Let him subscribe himself a headlong sharer,
And asses’ ears shall honour him or bearer.”

And in a similar style every card of the pack exposed some knavish scheme, and ridiculed the persons who were its dupes. It was computed that the total amount of the sums proposed for carrying on these projects was upwards of three hundred millions sterling.



MERCHANT'S GATEWAY

It is time, however, to return to the great South-Sea gulf, that swallowed the fortunes of so many thousands of the avaricious and the credulous. On the 29th of May, the stock had risen as high as five hundred, and about two-thirds of the government annuitants had exchanged the securities of the state for those of the South-Sea company. During the whole of the month of May the stock continued to rise, and on the 28th it was quoted at five hundred and fifty. In four days after this it took a prodigious leap, rising suddenly from five hundred and fifty to eight hundred and ninety. It was now the general opinion that the stock could rise no higher, and many persons took that opportunity of selling out, with a view of realising their profits. Many noblemen and persons in the train of the king, and about to accompany him to Hanover, were also anxious to sell out. So many sellers, and so few buyers, appeared in the Alley on the 3d of June, that the stock fell at once from eight hundred and ninety to six hundred and forty. The directors were alarmed, and gave their agents orders to buy. Their efforts

succeeded. Towards evening, confidence was restored, and the stock advanced to seven hundred and fifty. It continued at this price, with some slight fluctuation, until the company closed their books on the 22d of June.

It would be needless and uninteresting to detail the various arts employed by the directors to keep up the price of stock. It will be sufficient to state that it finally rose to one thousand per cent. It was quoted at this price in, the commencement of August. The bubble was then full-blown, and began to quiver and shake preparatory to its bursting.

Many of the government annuitants expressed dissatisfaction against the directors. They accused them of partiality in making out the lists for shares in each subscription. Further uneasiness was occasioned by its being generally known that Sir John Blunt the chairman, and some others, had sold out. During the whole of the month of August the stock fell, and on the 2d of September it was quoted at seven hundred only.

The state of things now became alarming. To prevent, if possible, the utter extinction of public confidence in their proceedings, the directors summoned a general court of the whole corporation, to meet in Merchant Tailors' Hall on the 8th of September. By nine o'clock in the morning, the room was filled to suffocation; Cheapside was blocked up by a crowd unable to gain admittance, and the greatest excitement prevailed. The directors and their friends mustered in great numbers. Sir John Fellowes, the sub-governor, was called to the chair. He acquainted the assembly with the cause of their meeting; read to them the several resolutions of the court of directors, and gave them an account of their proceedings; of the taking in the redeemable and unredeemable funds, and of the subscriptions in money. Mr. Secretary Craggs then made a short speech, wherein he commended the conduct of the directors, and urged that nothing could more effectually contribute to the bringing this scheme to perfection than union among themselves. He concluded with a motion for thanking the court of directors for their prudent and skilful management, and for desiring them to proceed in such manner as they should think most proper

for the interest and advantage of the corporation. Mr. Hungerford, who had rendered himself very conspicuous in the House of Commons for his zeal in behalf of the South-Sea company, and who was shrewdly suspected to have been a considerable gainer by knowing the right time to sell out, was very magniloquent on this occasion. He said that he had seen the rise and fall, the decay and resurrection of many communities of this nature, but that, in his opinion, none had ever performed such wonderful things in so short a time as the South-Sea company. They had done more than the crown, the pulpit, or the bench could do. They had reconciled all parties in one common interest; they had laid asleep, if not wholly extinguished, all the domestic jars and animosities of the nation. By the rise of their stock, monied men had vastly increased their fortunes; country gentlemen had seen the value of their lands doubled and trebled in their hands. They had at the same time done good to the Church, not a few of the reverend clergy having got great sums by the project. In short, they had enriched the whole nation, and he hoped they had not forgotten themselves. There was some hissing at the latter part of this speech, which for the extravagance of its eulogy was not far removed from satire; but the directors and their friends, and all the winners in the room, applauded vehemently. The Duke of Portland spoke in a similar strain, and expressed his great wonder why any body should be dissatisfied; of course, he was a winner by his speculations, and in a condition similar to that of the fat alderman in *Joe Miller's Jests*, who, whenever he had eaten a good dinner, folded his hands upon his paunch, and expressed his doubts whether there could be a hungry man in the world.



MR. SECRETARY CRAGGS.

Several resolutions were passed at this meeting, but they had no effect upon the public. Upon the very same evening the stock fell to six hundred and forty, and on the morrow to five hundred and forty. Day after day it continued to fall, until it was as low as four hundred. In a letter dated September 13th, from Mr. Broderick, M.P., to Lord Chancellor Middleton, and published in Coxe's *Walpole*, the former says: "Various are the conjectures why the South-Sea directors have suffered the cloud to break so early. I made no doubt but they would do so when they found it to their advantage. They have stretched credit so far beyond what it would bear, that specie proves insufficient to support it. Their most considerable men have drawn out, securing themselves by the losses of the deluded, thoughtless numbers, whose understandings have been overruled by avarice and the hope of making mountains out of mole-hills. Thousands of families will be reduced to beggary. The consternation is inexpressible—the rage beyond description, and the case altogether so desperate, that I do not see any plan or scheme so much as thought of for averting the blow, so that I cannot pretend to guess what is next to be done." Ten days afterwards, the stock still falling, he writes: "The company have yet come to no determination, for they are in such a wood that they know not which way to turn. By several gentlemen lately come to town, I perceive the very name of a South-Sea-man grows abominable in every country. A great many goldsmiths are already run off, and more will daily. I question whether one-third, nay, one-fourth of them can stand it. From the very beginning, I

founded my judgment of the whole affair upon the unquestionable maxim, that ten millions (which is more than our running cash) could not circulate two hundred millions, beyond which our paper credit extended. That, therefore, whenever that should become doubtful, be the cause what it would, our noble state machine must inevitably fall to the ground.”

On the 12th of September, at the earnest solicitation of Mr. Secretary Craggs, several conferences were held between the directors of the South Sea and the directors of the Bank. A report which was circulated, that the latter had agreed to circulate six millions of the South-Sea company's bonds, caused the stock to rise to six hundred and seventy; but in the afternoon, as soon as the report was known to be groundless, the stock fell again to five hundred and eighty; the next day to five hundred and seventy, and so gradually to four hundred.²⁰

The ministry were seriously alarmed at the aspect of affairs. The directors could not appear in the streets without being insulted; dangerous riots were every moment apprehended. Despatches were sent off to the king at Hanover, praying his immediate return. Mr. Walpole, who was staying at his country seat, was sent for, that he might employ his known influence with the directors of the Bank of England to induce them to accept the proposal made by the South-Sea company for circulating a number of their bonds.

The Bank was very unwilling to mix itself up with the affairs of the company; it dreaded being involved in calamities which it could not relieve, and received all overtures with visible reluctance. But the universal voice of the nation called upon it to come to the rescue. Every person of note in commercial politics was called in to advise in the emergency. A rough draft of a contract drawn up by Mr. Walpole was ultimately adopted as the basis of further negotiations, and the public alarm abated a little.

On the following day, the 20th of September, a general court of the South-Sea company was held at Merchant Tailors' Hall, in which resolutions were carried, empowering the directors to agree with the Bank

of England, or any other persons, to circulate the company's bonds, or make any other agreement with the Bank which they should think proper. One of the speakers, a Mr. Pulteney, said it was most surprising to see the extraordinary panic which had seized upon the people. Men were running to and fro in alarm and terror, their imaginations filled with some great calamity, the form and dimensions of which nobody knew:

“Black it stood as night—
Fierce as ten furies—terrible as hell.”

At a general court of the Bank of England held two days afterwards, the governor informed them of the several meetings that had been held on the affairs of the South-Sea company, adding that the directors had not yet thought fit to come to any decision upon the matter. A resolution was then proposed, and carried without a dissentient voice, empowering the directors to agree with those of the South Sea to circulate their bonds, to what sum, and upon what terms, and for what time, they might think proper.

Thus both parties were at liberty to act as they might judge best for the public interest. Books were opened at the Bank for a subscription of three millions for the support of public credit, on the usual terms of 15*l.* per cent deposit, 3*l.* per cent premium, and 5*l.* per cent interest. So great was the concourse of people in the early part of the morning, all eagerly bringing their money, that it was thought the subscription would be filled that day; but before noon, the tide turned. In spite of all that could be done to prevent it, the South-Sea company's stock fell rapidly. Their bonds were in such discredit, that a run commenced upon the most eminent goldsmiths and bankers, some of whom, having lent out great sums upon South-Sea stock, were obliged to shut up their shops and abscond. The Sword-blade

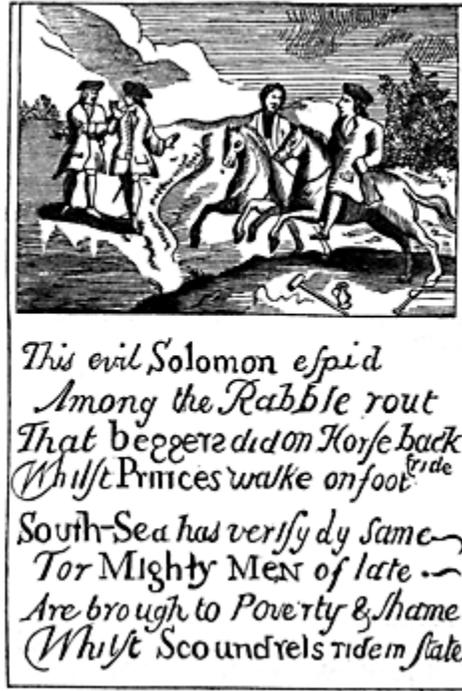
company, who had hitherto been the chief cashiers of the South-Sea company, stopped payment. This being looked upon as but the beginning of evil, occasioned a great run upon the Bank, who were now obliged to pay out money much faster than they had received it upon the subscription in the morning. The day succeeding was a holiday (the 29th of September), and the Bank had a little breathing time. They bore up against the storm; but their former rivals, the South-Sea company, were wrecked upon it. Their stock fell to one hundred and fifty, and gradually, after various fluctuations, to one hundred and thirty-five.

The Bank, finding they were not able to restore public confidence, and stem the tide of ruin, without running the risk of being swept away with those they intended to save, declined to carry out the agreement into which they had partially entered. They were under no obligation whatever to continue; for the so-called Bank contract was nothing more than the rough draught of an agreement, in which blanks had been left for several important particulars, and which contained no penalty for their secession. “And thus,” to use the words of the Parliamentary History, “were seen, in the space of eight months, the rise, progress, and fall of that mighty fabric, which, being wound up by mysterious springs to a wonderful height, had fixed the eyes and expectations of all Europe, but whose foundation, being fraud, illusion, credulity, and infatuation, fell to the ground as soon as the artful management of its directors was discovered.”

In the hey-day of its blood, during the progress of this dangerous delusion, the manners of the nation became sensibly corrupted. The parliamentary inquiry, set on foot to discover the delinquents, disclosed scenes of infamy, disgraceful alike to the morals of the

offenders and the intellects of the people among whom they had arisen. It is a deeply interesting study to investigate all the evils that were the result. Nations, like individuals, cannot become desperate gamblers with impunity. Punishment is sure to overtake them sooner or later. A celebrated writer²¹ is quite wrong when he says, “that such an era as this is the most unfavourable for a historian; that no reader of sentiment and imagination can be entertained or interested by a detail of transactions such as these, which admit of no warmth, no colouring, no embellishment; a detail of which only serves to exhibit an inanimate picture of tasteless vice and mean degeneracy.” On the contrary,—and Smollett might have discovered it, if he had been in the humour,—the subject is capable of inspiring as much interest as even a novelist can desire. Is there no warmth in the despair of a plundered people?—no life and animation in the picture which might be drawn of the woes of hundreds of impoverished and ruined families? of the wealthy of yesterday become the beggars of to-day? of the powerful and influential changed into exiles and outcasts, and the voice of self-reproach and imprecation resounding from every corner of the land? Is it a dull or uninteresting picture to see a whole people shaking suddenly off the trammels of reason, and running wild after a golden vision, refusing obstinately to believe that it is not real, till, like a deluded hind running after an *ignis fatuus*, they are plunged into a quagmire? But in this false spirit has history too often been written. The intrigues of unworthy courtiers to gain the favour of still more unworthy kings, or the records of murderous battles and sieges, have been dilated on, and told over and over again, with all the eloquence of style and all the charms of fancy; while the circumstances which have most deeply affected the morals and

welfare of the people have been passed over with but slight notice, as dry and dull, and capable of neither warmth nor colouring.



CARICATURE. ²²

During the progress of this famous bubble, England presented a singular spectacle. The public mind was in a state of unwholesome fermentation. Men were no longer satisfied with the slow but sure profits of cautious industry. The hope of boundless wealth for the morrow made them heedless and extravagant for to-day. A luxury, till then unheard-of, was introduced, bringing in its train a corresponding laxity of morals. The over-bearing insolence of ignorant men, who had arisen to sudden wealth by successful gambling, made men of true gentility of mind and manners blush that gold should have power to raise the unworthy in the scale of society. The haughtiness of some of these “cyphering cits,” as they were termed by Sir Richard Steele, was remembered against them in

the day of their adversity. In the parliamentary inquiry, many of the directors suffered more for their insolence than for their speculation. One of them, who, in the full-blown pride of an ignorant rich man, had said that he would feed his horse upon gold, was reduced almost to bread and water for himself; every haughty look, every overbearing speech, was set down, and repaid them a hundredfold in poverty and humiliation.

The state of matters all over the country was so alarming, that George I. shortened his intended stay in Hanover, and returned in all haste to England. He arrived on the 11th of November, and parliament was summoned to meet on the 8th of December. In the mean time, public meetings were held in every considerable town of the empire, at which petitions were adopted, praying the vengeance of the legislature upon the South-Sea directors, who, by their fraudulent practices, had brought the nation to the brink of ruin. Nobody seemed to imagine that the nation itself was as culpable as the South-Sea company. Nobody blamed the credulity and avarice of the people,—the degrading lust of gain, which had swallowed up every nobler quality in the national character, or the infatuation which had made the multitude run their heads with such frantic eagerness into the net held out for them by scheming projectors. These things were never mentioned. The people were a simple, honest, hard-working people, ruined by a gang of robbers, who were to be hanged, drawn, and quartered without mercy.

This was the almost unanimous feeling of the country. The two Houses of Parliament were not more reasonable. Before the guilt of the South-Sea directors was known, punishment was the only cry. The king, in his speech from the throne, expressed his hope that they

would remember that all their prudence, temper, and resolution were necessary to find out and apply the proper remedy for their misfortunes. In the debate on the answer to the address, several speakers indulged in the most violent invectives against the directors of the South-Sea project. The Lord Molesworth was particularly vehement. "It had been said by some, that there was no law to punish the directors of the South-Sea company, who were justly looked upon as the authors of the present misfortunes of the state. In his opinion, they ought upon this occasion to follow the example of the ancient Romans, who, having no law against parricide, because their legislators supposed no son could be so unnaturally wicked as to embrue his hands in his father's blood, made a law to punish this heinous crime as soon as it was committed. They adjudged the guilty wretch to be sown in a sack, and thrown alive into the Tiber. He looked upon the contrivers and executors of the villanous South-Sea scheme as the parricides of their country, and should be satisfied to see them tied in like manner in sacks, and thrown into the Thames." Other members spoke with as much want of temper and discretion. Mr. Walpole was more moderate. He recommended that their first care should be to restore public credit. "If the city of London were on fire, all wise men would aid in extinguishing the flames, and preventing the spread of the conflagration, before they inquired after the incendiaries. Public credit had received a dangerous wound, and lay bleeding, and they ought to apply a speedy remedy to it. It was time enough to punish the assassin afterwards." On the 9th of December an address, in answer to his majesty's speech, was agreed upon, after an amendment, which was carried without a division, that words should be added expressive of the determination of the

house not only to seek a remedy for the national distresses, but to punish the authors of them.



BRITANNIA STRIPT BY A SOUTH-SEA DIRECTOR.²³

The inquiry proceeded rapidly. The directors were ordered to lay before the house a full account of all their proceedings. Resolutions were passed to the effect that the calamity was mainly owing to the vile arts of stock-jobbers, and that nothing could tend more to the reestablishment of public credit than a law to prevent this infamous practice. Mr. Walpole then rose, and said, that “as he had previously hinted, he had spent some time upon a scheme for restoring public credit, but that the execution of it depending upon a position which had been laid down as fundamental, he thought it proper, before he opened out his scheme, to be informed whether he might rely upon that foundation. It was, whether the subscription of public debts and encumbrances, money subscriptions, and other contracts, made with the South-Sea company, should remain in the present state?” This question occasioned an animated debate. It was finally agreed, by a

majority of 259 against 117, that all these contracts should remain in their present state, unless altered for the relief of the proprietors by a general court of the South-Sea company, or set aside by due course of law. On the following day, Mr. Walpole laid before a committee of the whole house his scheme for the restoration of public credit, which was, in substance, to engraft nine millions of South-Sea stock into the Bank of England, and the same sum into the East India company, upon certain conditions. The plan was favourably received by the house. After some few objections, it was ordered that proposals should be received from the two great corporations. They were both unwilling to lend their aid, and the plan met with a warm but fruitless opposition at the general courts summoned for the purpose of deliberating upon it. They, however, ultimately agreed upon the terms on which they would consent to circulate the South-Sea bonds, and their report being presented to the committee, a bill was brought in under the superintendence of Mr. Walpole, and safely carried through both Houses of Parliament.

A bill was at the same time brought in for restraining the South-Sea directors, governor, sub-governor, treasurer, cashier, and clerks from leaving the kingdom for a twelvemonth, and for discovering their estates and effects, and preventing them from transporting or alienating the same. All the most influential members of the House supported the bill. Mr. Shippen, seeing Mr. Secretary Craggs in his place, and believing the injurious rumours that were afloat of that minister's conduct in the South-Sea business, determined to touch him to the quick. He said, he was glad to see a British House of Commons resuming its pristine vigour and spirit, and acting with so much unanimity for the public good. It was necessary to secure the

persons and estates of the South-Sea directors and their officers; “but,” he added, looking fixedly at Mr. Craggs as he spoke, “there were other men in high station, whom, in time, he would not be afraid to name, who were no less guilty than the directors.” Mr. Craggs arose in great wrath, and said, that if the innuendo were directed against him, he was ready to give satisfaction to any man who questioned him, either in the House or out of it. Loud cries of order immediately arose on every side. In the midst of the uproar, Lord Molesworth got up, and expressed his wonder at the boldness of Mr. Craggs in challenging the whole House of Commons. He, Lord Molesworth, though somewhat old, past sixty, would answer Mr. Craggs whatever he had to say in the House, and he trusted there were plenty of young men beside him, who would not be afraid to look Mr. Craggs in the face out of the House. The cries of order again resounded from every side; the members arose simultaneously; every body seemed to be vociferating at once. The speaker in vain called order. The confusion lasted several minutes, during which Lord Molesworth and Mr. Craggs were almost the only members who kept their seats. At last, the call for Mr. Craggs became so violent, that he thought proper to submit to the universal feeling of the House, and explain his unparliamentary expression. He said, that by giving satisfaction to the impugnors of his conduct in that House, he did not mean that he would fight, but that he would explain his conduct. Here the matter ended, and the House proceeded to debate in what manner they should conduct their inquiry into the affairs of the South-Sea company, whether in a grand or a select committee. Ultimately, a secret committee of thirteen was appointed, with power to send for persons, papers, and records.

The Lords were as zealous and as hasty as the Commons. The Bishop of Rochester said the scheme had been like a pestilence. The Duke of Wharton said the House ought to shew no respect of persons; that, for his part, he would give up the dearest friend he had, if he had been engaged in the project. The nation had been plundered in a most shameful and flagrant manner, and he would go as far as any body in the punishment of the offenders. Lord Stanhope said, that every farthing possessed by the criminals, whether directors or not directors, ought to be confiscated, to make good the public losses.

During all this time the public excitement was extreme. We learn from Coxe's *Walpole*, that the very name of a South-Sea director was thought to be synonymous with every species of fraud and villany. Petitions from counties, cities, and boroughs, in all parts of the kingdom, were presented, crying for the justice due to an injured nation and the punishment of the villanous peculators. Those moderate men, who would not go to extreme lengths, even in the punishment of the guilty, were accused of being accomplices, were exposed to repeated insults and virulent invectives, and devoted, both in anonymous letters and public writings, to the speedy vengeance of an injured people. The accusations against Mr. Aislabie, Chancellor of the Exchequer, and Mr. Craggs, another member of the ministry, were so loud, that the House of Lords resolved to proceed at once into the investigation concerning them. It was ordered, on the 21st of January, that all brokers concerned in the South-Sea scheme should lay before the House an account of the stock or subscriptions bought or sold by them for any of the officers of the Treasury or Exchequer, or in trust for any of them, since Michaelmas

1719. When this account was delivered, it appeared that large quantities of stock had been transferred to the use of Mr. Aislabie. Five of the South-Sea directors, including Mr. Edward Gibbon, the grandfather of the celebrated historian, were ordered into the custody of the black rod. Upon a motion made by Earl Stanhope, it was unanimously resolved, that the taking in or giving credit for stock without a valuable consideration actually paid or sufficiently secured; or the purchasing stock by any director or agent of the South-Sea company, for the use or benefit of any member of the administration, or any member of either House of Parliament, during such time as the South-Sea bill was yet pending in parliament, was a notorious and dangerous corruption. Another resolution was passed a few days afterwards, to the effect that several of the directors and officers of the company having, in a clandestine manner, sold their own stock to the company, had been guilty of a notorious fraud and breach of trust, and had thereby mainly caused the unhappy turn of affairs that had so much affected public credit. Mr. Aislabie resigned his office as Chancellor of the Exchequer, and absented himself from parliament, until the formal inquiry into his individual guilt was brought under the consideration of the legislature.

In the mean time, Knight, the treasurer of the company, and who was entrusted with all the dangerous secrets of the dishonest directors, packed up his books and documents, and made his escape from the country. He embarked in disguise, in a small boat on the river, and proceeding to a vessel hired for the purpose, was safely conveyed to Calais. The Committee of Secrecy informed the House of the circumstance, when it was resolved unanimously that two

addresses should be presented to the king; the first praying that he would issue a proclamation offering a reward for the apprehension of Knight; and the second, that he would give immediate orders to stop the ports, and to take effectual care of the coasts, to prevent the said Knight, or any other officers of the South-Sea company, from escaping out of the kingdom. The ink was hardly dry upon these addresses before they were carried to the king by Mr. Methuen, deputed by the House for that purpose. The same evening a royal proclamation was issued, offering a reward of two thousand pounds for the apprehension of Knight. The Commons ordered the doors of the House to be locked, and the keys to be placed on the table. General Ross, one of the members of the Committee of Secrecy, acquainted them that they had already discovered a train of the deepest villany and fraud that hell had ever contrived to ruin a nation, which in due time they would lay before the House. In the mean time, in order to a further discovery, the Committee thought it highly necessary to secure the persons of some of the directors and principal South-Sea officers, and to seize their papers. A motion to this effect having been made, was carried unanimously. Sir Robert Chaplin, Sir Theodore Janssen, Mr. Sawbridge, and Mr. F. Eyles, members of the House, and directors of the South-Sea company, were summoned to appear in their places, and answer for their corrupt practices. Sir Theodore Janssen and Mr. Sawbridge answered to their names, and endeavoured to exculpate themselves. The House heard them patiently, and then ordered them to withdraw. A motion was then made, and carried *nemine contradicente*, that they had been guilty of a notorious breach of trust—had occasioned much loss to great numbers of his majesty's

subjects, and had highly prejudiced the public credit. It was then ordered that, for their offence, they should be expelled the House, and taken into the custody of the serjeant-at-arms. Sir Robert Chaplin and Mr. Eyles, attending in their places four days afterwards, were also expelled the House. It was resolved at the same time to address the king to give directions to his ministers at foreign courts to make application for Knight, that he might be delivered up to the English authorities, in case he took refuge in any of their dominions. The king at once agreed, and messengers were despatched to all parts of the continent the same night.

Among the directors taken into custody was Sir John Blunt, the man whom popular opinion has generally accused of having been the original author and father of the scheme. This man, we are informed by Pope, in his epistle to Allen Lord Bathurst, was a dissenter, of a most religious deportment, and professed to be a great believer.²⁴ He constantly declaimed against the luxury and corruption of the age, the partiality of parliaments, and the misery of party spirit. He was particularly eloquent against avarice in great and noble persons. He was originally a scrivener, and afterwards became, not only a director, but the most active manager of the South-Sea company. Whether it was during his career in this capacity that he first began to declaim against the avarice of the great, we are not informed. He certainly must have seen enough of it to justify his severest anathema; but if the preacher had himself been free from the vice he condemned, his declamations would have had a better effect. He was brought up in custody to the bar of the House of Lords, and underwent a long examination. He refused to answer several important questions. He said he had been examined already by a

committee of the House of Commons, and as he did not remember his answers, and might contradict himself, he refused to answer before another tribunal. This declaration, in itself an indirect proof of guilt, occasioned some commotion in the House. He was again asked peremptorily whether he had ever sold any portion of the stock to any member of the administration, or any member of either House of Parliament, to facilitate the passing of the bill. He again declined to answer. He was anxious, he said, to treat the House with all possible respect, but he thought it hard to be compelled to accuse himself. After several ineffectual attempts to refresh his memory, he was directed to withdraw. A violent discussion ensued between the friends and opponents of the ministry. It was asserted that the administration were no strangers to the convenient taciturnity of Sir John Blunt. The Duke of Wharton made a reflection upon the Earl Stanhope, which the latter warmly resented. He spoke under great excitement, and with such vehemence as to cause a sudden determination of blood to the head. He felt himself so ill that he was obliged to leave the House and retire to his chamber. He was cupped immediately, and also let blood on the following morning, but with slight relief. The fatal result was not anticipated. Towards evening he became drowsy, and turning himself on his face, expired. The sudden death of this statesman caused great grief to the nation. George I. was exceedingly affected, and shut himself up for some hours in his closet, inconsolable for his loss.

Knight, the treasurer of the company, was apprehended at Tirlemont, near Liege, by one of the secretaries of Mr. Leathes, the British resident at Brussels, and lodged in the citadel of Antwerp. Repeated applications were made to the court of Austria to deliver

him up, but in vain. Knight threw himself upon the protection of the states of Brabant, and demanded to be tried in that country. It was a privilege granted to the states of Brabant by one of the articles of the *Joyeuse Entrée*, that every criminal apprehended in that country should be tried in that country. The states insisted on their privilege, and refused to deliver Knight to the British authorities. The latter did not cease their solicitations; but in the mean time, Knight escaped from the citadel.



BRABANT SCREEN. ²⁵

On the 16th of February the Committee of Secrecy made their first report to the House. They stated that their inquiry had been attended with numerous difficulties and embarrassments; every one they had examined had endeavoured, as far as in him lay, to defeat the ends of justice. In some of the books produced before them, false and fictitious entries had been made; in others, there were entries of money with blanks for the name of the stockholders. There were frequent erasures and alterations, and in some of the books leaves were torn out. They also found that some books of great importance had been destroyed altogether, and that some had been taken away or secreted. At the very entrance into their inquiry, they had

observed that the matters referred to them were of great variety and extent. Many persons had been entrusted with various parts in the execution of the law, and under colour thereof had acted in an unwarrantable manner, in disposing of the properties of many thousands of persons amounting to many millions of money. They discovered that, before the South-Sea Act was passed, there was an entry in the company's books of the sum of 1,259,325*l.*, upon account of stock stated to have been sold to the amount of 574,500*l.* This stock was all fictitious, and had been disposed of with a view to promote the passing of the bill. It was noted as sold on various days, and at various prices, from 150 to 325 per cent. Being surprised to see so large an account disposed of at a time when the company were not empowered to increase their capital, the Committee determined to investigate most carefully the whole transaction. The governor, sub-governor, and several directors were brought before them, and examined rigidly. They found that, at the time these entries were made, the company was not in possession of such a quantity of stock, having in their own right only a small quantity, not exceeding thirty thousand pounds at the utmost. Pursuing the inquiry, they found that this amount of stock was to be esteemed as taken in or holden by the company for the benefit of the pretended purchasers, although no mutual agreement was made for its delivery or acceptance at any certain time. No money was paid down, nor any deposit or security whatever given to the company by the supposed purchasers; so that if the stock had fallen, as might have been expected had the act not passed, they would have sustained no loss. If, on the contrary, the price of stock advanced (as it actually did by the success of the scheme), the difference by the advanced price was to be made good

to them. Accordingly, after the passing of the act, the account of stock was made up and adjusted with Mr. Knight, and the pretended purchasers were paid the difference out of the company's cash. This fictitious stock, which had been chiefly at the disposal of Sir John Blunt, Mr. Gibbon, and Mr. Knight, was distributed among several members of the government and their connexions, by way of bribe, to facilitate the passing of the bill. To the Earl of Sunderland was assigned 50,000*l.*; to the Duchess of Kendal, 10,000*l.*; to the Countess of Platen, 10,000*l.*; to her two nieces, 10,000*l.*; to Mr. Secretary Craggs, 30,000*l.*; to Mr. Charles Stanhope (one of the secretaries of the Treasury), 10,000*l.*; to the Sword-blade company, 50,000*l.* It also appeared that Mr. Stanhope had received the enormous sum of 250,000*l.* as the difference in the price of some stock, through the hands of Turner, Caswall, and Co., but that his name had been partly erased from their books, and altered to Stangape. Aislabie, the Chancellor of the Exchequer, had made profits still more abominable. He had an account with the same firm, who were also South-Sea directors, to the amount of 794,451*l.* He had, besides, advised the company to make their second subscription one million and a half, instead of a million, by their own authority, and without any warrant. The third subscription had been conducted in a manner as disgraceful. Mr. Aislabie's name was down for 70,000*l.*; Mr. Craggs, senior, for 659,000*l.*; the Earl of Sunderland's for 160,000*l.*; and Mr. Stanhope for 47,000*l.* This report was succeeded by six others, less important. At the end of the last, the committee declared, that the absence of Knight, who had been principally entrusted, prevented them from carrying on their inquiries.

The first report was ordered to be printed, and taken into consideration on the next day but one succeeding. After a very angry and animated debate, a series of resolutions were agreed to, condemnatory of the conduct of the directors, of the members of the parliament and of the administration concerned with them; and declaring that they ought, each and all, to make satisfaction out of their own estates for the injury they had done the public. Their practices were declared to be corrupt, infamous, and dangerous; and a bill was ordered to be brought in for the relief of the unhappy sufferers.



BONFIRES ON TOWER HILL

Mr. Charles Stanhope was the first person brought to account for his share in these transactions. He urged in his defence that, for some years past, he had lodged all the money he was possessed of in Mr. Knight's hands, and whatever stock Mr. Knight had taken in for him, he had paid a valuable consideration for it. As for the stock that had been bought for him by Turner, Caswall, and Co., he knew nothing about it. Whatever had been done in that matter was done

without his authority, and he could not be responsible for it. Turner and Co. took the latter charge upon themselves; but it was notorious to every unbiassed and unprejudiced person that Mr. Stanhope was a gainer of the 250,000*l.*, which lay in the hands of that firm to his credit. He was, however, acquitted by a majority of three only. The greatest exertions were made to screen him. Lord Stanhope, the son of the Earl of Chesterfield, went round to the wavering members, using all the eloquence he was possessed of to induce them either to vote for the acquittal, or to absent themselves from the House. Many weak-headed country gentlemen were led astray by his persuasions, and the result was as already stated. The acquittal caused the greatest discontent throughout the country. Mobs of a menacing character assembled in different parts of London; fears of riots were generally entertained, especially as the examination of a still greater delinquent was expected by many to have a similar termination. Mr. Aislable, whose high office and deep responsibilities should have kept him honest, even had native principle been insufficient, was very justly regarded as perhaps the greatest criminal of all. His case was entered into on the day succeeding the acquittal of Mr. Stanhope. Great excitement prevailed, and the lobbies and avenues of the House were beset by crowds, impatient to know the result. The debate lasted the whole day. Mr. Aislable found few friends: his guilt was so apparent and so heinous that nobody had courage to stand up in his favour. It was finally resolved, without a dissentient voice, that Mr. Aislable had encouraged and promoted the destructive execution of the South-Sea scheme with a view to his own exorbitant profit, and had combined with the directors in their pernicious practices, to the ruin of the public trade and credit of the kingdom: that he should

for his offences be ignominiously expelled from the House of Commons, and committed a close prisoner to the Tower of London; that he should be restrained from going out of the kingdom for a whole year, or till the end of the next session of Parliament; and that he should make out a correct account of all his estate, in order that it might be applied to the relief of those who had suffered by his malpractices.

This verdict caused the greatest joy. Though it was delivered at half-past twelve at night, it soon spread over the city. Several persons illuminated their houses in token of their joy. On the following day, when Mr. Aislable was conveyed to the Tower, the mob assembled on Tower-hill with the intention of hooting and pelting him. Not succeeding in this, they kindled a large bonfire, and danced around it in the exuberance of their delight. Several bonfires were made in other places; London presented the appearance of a holiday, and people congratulated one another as if they had just escaped from some great calamity. The rage upon the acquittal of Mr. Stanhope had grown to such a height that none could tell where it would have ended, had Mr. Aislable met with the like indulgence.

To increase the public satisfaction, Sir George Caswall, of the firm of Turner, Caswall, and Co., was expelled from the House on the following day, committed to the Tower, and ordered to refund the sum of 250,000*l.*



EARL OF SUNDERLAND.

That part of the report of the Committee of Secrecy which related to the Earl of Sunderland was next taken into consideration. Every effort was made to clear his lordship from the imputation. As the case against him rested chiefly on the evidence extorted from Sir John Blunt, great pains were taken to make it appear that Sir John's word was not to be believed, especially in a matter affecting the honour of a peer and privy councillor. All the friends of the ministry rallied around the earl, it being generally reported that a verdict of guilty against him would bring a Tory ministry into power. He was eventually acquitted by a majority of 233 against 172; but the country was convinced of his guilt. The greatest indignation was every where expressed, and menacing mobs again assembled in London. Happily no disturbance took place.

This was the day on which Mr. Craggs the elder expired. The morrow had been appointed for the consideration of his case. It was very generally believed that he had poisoned himself. It appeared, however, that grief for the loss of his son, one of the secretaries of the Treasury, who had died five weeks previously of the small-pox, preyed much on his mind. For this son, dearly beloved, he had been amassing vast heaps of riches: he had been getting money, but not

honestly; and he for whose sake he had bartered his honour and sullied his fame was now no more. The dread of further exposure increased his trouble of mind, and ultimately brought on an apoplectic fit, in which he expired. He left a fortune of a million and a half, which was afterwards confiscated for the benefit of the sufferers by the unhappy delusion he had been so mainly instrumental in raising.

One by one the case of every director of the company was taken into consideration. A sum amounting to two millions and fourteen thousand pounds was confiscated from their estates towards repairing the mischief they had done, each man being allowed a certain residue in proportion to his conduct and circumstances, with which he might begin the world anew. Sir John Blunt was only allowed 5,000*l.* out of his fortune of upwards of 183,000*l.*; Sir John Fellows was allowed 10,000*l.* out of 243,000*l.*; Sir Theodore Janssen, 50,000*l.* out of 243,000*l.*; Mr. Edward Gibbon, 10,000*l.* out of 106,000*l.*; Sir John Lambert, 5000*l.* out of 72,000*l.* Others, less deeply involved, were treated with greater liberality. Gibbon, the historian, whose grandfather was the Mr. Edward Gibbon so severely mulcted, has given, in the *Memoirs of his Life and Writings*, an interesting account of the proceedings in parliament at this time. He owns that he is not an unprejudiced witness; but, as all the writers from which it is possible to extract any notice of the proceedings of these disastrous years were prejudiced on the other side, the statements of the great historian become of additional value. If only on the principle *audi alteram partem*, his opinion is entitled to consideration. "In the year 1716," he says, "my grandfather was elected one of the directors of the South-Sea company, and his books

exhibited the proof that before his acceptance of that fatal office, he had acquired an independent fortune of 60,000*l.* But his fortune was overwhelmed in the shipwreck of the year 1720, and the labours of thirty years were blasted in a single day. Of the use or abuse of the South-Sea scheme, of the guilt or innocence of my grandfather and his brother directors, I am neither a competent nor a disinterested judge. Yet the equity of modern times must condemn the violent and arbitrary proceedings, which would have disgraced the cause of justice, and rendered injustice still more odious. No sooner had the nation awakened from its golden dream, than a popular and even a parliamentary clamour demanded its victims; but it was acknowledged on all sides, that the directors, however guilty, could not be touched by any known laws of the land. The intemperate notions of Lord Molesworth were not literally acted on; but a bill of pains and penalties was introduced—a retro-active statute, to punish the offences which did not exist at the time they were committed. The legislature restrained the persons of the directors, imposed an exorbitant security for their appearance, and marked their character with a previous note of ignominy. They were compelled to deliver, upon oath, the strict value of their estates, and were disabled from making any transfer or alienation of any part of their property. Against a bill of pains and penalties, it is the common right of every subject to be heard by his counsel at the bar. They prayed to be heard. Their prayer was refused, and their oppressors, who required no evidence, would listen to no defence. It had been at first proposed, that one-eighth of their respective estates should be allowed for the future support of the directors; but it was especially urged that, in the various shades of opulence and guilt, such a proportion would be

too light for many, and for some might possibly be too heavy. The character and conduct of each man were separately weighed; but, instead of the calm solemnity of a judicial inquiry, the fortune and honour of thirty-three Englishmen were made the topics of hasty conversation, the sport of a lawless majority; and the basest member of the committee, by a malicious word or a silent vote, might indulge his general spleen or personal animosity. Injury was aggravated by insult, and insult was embittered by pleasantry. Allowances of 20*l.* or 1*s.* were facetiously moved. A vague report that a director had formerly been concerned in another project, by which some unknown persons had lost their money, was admitted as a proof of his actual guilt. One man was ruined because he had dropped a foolish speech, that his horses should feed upon gold; another, because he was grown so proud, that one day, at the Treasury, he had refused a civil answer to persons much above him. All were condemned, absent and unheard, in arbitrary fines and forfeitures, which swept away the greatest part of their substance. Such bold oppression can scarcely be shielded by the omnipotence of parliament. My grandfather could not expect to be treated with more lenity than his companions. His Tory principles and connexions rendered him obnoxious to the ruling powers. His name was reported in a suspicious secret. His well-known abilities could not plead the excuse of ignorance or error. In the first proceedings against the South-Sea directors, Mr. Gibbon was one of the first taken into custody, and in the final sentence the measure of his fine proclaimed him eminently guilty. The total estimate, which he delivered on oath to the House of Commons, amounted to 106,543*l.* 5*s.* 6*d.*, exclusive of antecedent settlements. Two different allowances

of 15,000*l.* and of 10,000*l.* were moved for Mr. Gibbon; but on the question being put, it was carried without a division for the smaller sum. On these ruins, with the skill and credit of which parliament had not been able to despoil him, my grandfather, at a mature age, erected the edifice of a new fortune. The labours of sixteen years were amply rewarded; and I have reason to believe that the second structure was not much inferior to the first.”



THE SOUTH-SEA BUBBLE.—CARICATURE BY HOGARTH.²⁶

The next consideration of the legislature, after the punishment of the directors, was to restore public credit. The scheme of Walpole had been found insufficient, and had fallen into disrepute. A computation was made of the whole capital stock of the South-Sea company at the end of the year 1720. It was found to amount to thirty-seven millions eight hundred thousand pounds, of which the stock allotted to all the proprietors only amounted to twenty-four millions five hundred thousand pounds. The remainder of thirteen millions three hundred thousand pounds belonged to the company in their corporate capacity, and was the profit they had made by the national delusion. Upwards of eight millions of this were taken from

the company, and divided among the proprietors and subscribers generally, making a dividend of about 33*l.* 6*s.* 8*d.* per cent. This was a great relief. It was further ordered, that such persons as had borrowed money from the South-Sea company upon stock actually transferred and pledged at the time of borrowing to or for the use of the company, should be free from all demands, upon payment of ten per cent of the sums so borrowed. They had lent about eleven millions in this manner, at a time when prices were unnaturally raised; and they now received back one million one hundred thousand, when prices had sunk to their ordinary level.

But it was a long time before public credit was thoroughly restored. Enterprise, like Icarus, had soared too high, and melted the wax of her wings; like Icarus, she had fallen into a sea, and learned, while floundering in its waves, that her proper element was the solid ground. She has never since attempted so high a flight.

In times of great commercial prosperity there has been a tendency to over-speculation on several occasions since then. The success of one project generally produces others of a similar kind. Popular imitativeness will always, in a trading nation, seize hold of such successes, and drag a community too anxious for profits into an abyss from which extrication is difficult. Bubble companies, of a kind similar to those engendered by the South-Sea project, lived their little day in the famous year of the panic, 1825. On that occasion, as in 1720, knavery gathered a rich harvest from cupidity, but both suffered when the day of reckoning came. The schemes of the year 1836 threatened, at one time, results as disastrous; but they were happily averted before it was too late.²⁷



BUBBLERS' ARMS—DESPAIR—FROM A PRINT IN THE COLLECTION OF E.
HAWKINS, ESQ.



CONRAD GESNER.

THE TULIPOMANIA.

Quis furor, ô cives!—*Lucan.*

THE tulip,—so named, it is said, from a Turkish word, signifying a turban,—was introduced into western Europe about the middle of the sixteenth century. Conrad Gesner, who claims the merit of having brought it into repute,—little dreaming of the commotion it was shortly afterwards to make in the world,—says that he first saw it in the year 1559, in a garden at Augsburg, belonging to the learned Counsellor Herwart, a man very famous in his day for his collection of rare exotics. The bulbs were sent to this gentleman by a friend at Constantinople, where the flower had long been a favourite. In the course of ten or eleven years after this period, tulips were much sought after by the wealthy, especially in Holland and Germany. Rich people at Amsterdam sent for the bulbs direct to Constantinople, and paid the most extravagant prices for them. The first roots planted in England were brought from Vienna in 1600. Until the year 1634 the tulip annually increased in reputation, until it was deemed a proof of bad taste in any man of fortune to be without a collection of them. Many learned men, including Pompeius de Angelis and the celebrated Lipsius of Leyden, the author of the treatise “*De Constantia*,” were passionately fond of tulips. The rage for possessing them soon caught the middle classes of society, and merchants and shopkeepers, even of moderate means, began to vie with each other in the rarity of these flowers and the preposterous prices they paid for them. A trader at Harlaem was known to pay one-half of his fortune for a single root, not with the design of selling it again at a profit, but to keep in his own conservatory for the admiration of his acquaintance.

One would suppose that there must have been some great virtue in this flower to have made it so valuable in the eyes of so prudent a people as the Dutch; but it has neither the beauty nor the perfume of the rose—hardly the beauty of the “sweet, sweet-pea;” neither is it as enduring as either. Cowley, it is true, is loud in its praise. He says—

“The tulip next appeared, all over gay,
But wanton, full of pride, and full of play;
The world can’t shew a dye but here has place;
Nay, by new mixtures, she can change her face;
Purple and gold are both beneath her care,
The richest needlework she loves to wear;
Her only study is to please the eye,
And to outshine the rest in finery.”

This, though not very poetical, is the description of a poet. Beckmann, in his *History of Inventions*, paints it with more fidelity, and in prose more pleasing than Cowley’s poetry. He says, “There are few plants which acquire, through accident, weakness, or disease, so many variegations as the tulip. When uncultivated, and in its natural state, it is almost of one colour, has large leaves, and an extraordinarily long stem. When it has been weakened by cultivation, it becomes more agreeable in the eyes of the florist. The petals are then paler, smaller, and more diversified in hue; and the leaves acquire a softer green colour. Thus this masterpiece of culture, the more beautiful it turns, grows so much the weaker, so that, with the greatest skill and most careful attention, it can scarcely be transplanted, or even kept alive.”

Many persons grow insensibly attached to that which gives them a great deal of trouble, as a mother often loves her sick and ever-ailing child better than her more healthy offspring. Upon the same principle we must account

for the unmerited encomia lavished upon these fragile blossoms. In 1634, the rage among the Dutch to possess them was so great that the ordinary industry of the country was neglected, and the population, even to its lowest dregs, embarked in the tulip trade. As the mania increased, prices augmented, until, in the year 1635, many persons were known to invest a fortune of 100,000 florins in the purchase of forty roots. It then became necessary to sell them by their weight in *perits*, a small weight less than a grain. A tulip of the species called *Admiral Liefken*, weighing 400 *perits*, was worth 4400 florins; an *Admiral Van der Eyck*, weighing 446 *perits*, was worth 1260 florins; a *Childer* of 106 *perits* was worth 1615 florins; a *Viceroy* of 400 *perits*, 3000 florins, and, most precious of all, a *Semper Augustus*, weighing 200 *perits*, was thought to be very cheap at 5500 florins. The latter was much sought after, and even an inferior bulb might command a price of 2000 florins. It is related that, at one time, early in 1636, there were only two roots of this description to be had in all Holland, and those not of the best. One was in the possession of a dealer in Amsterdam, and the other in Harlaem. So anxious were the speculators to obtain them, that one person offered the fee-simple of twelve acres of building-ground for the Harlaem tulip. That of Amsterdam was bought for 4600 florins, a new carriage, two grey horses, and a complete suit of harness. Hunting, an industrious author of that day, who wrote a folio volume of one thousand pages upon the tulipomania, has preserved the folio wing list of the various articles, and their value, which were delivered for one single root of the rare species called the *Viceroy*:

	florins.
Two lasts of wheat	448
Four lasts of rye	558
Four fat oxen	480
Eight fat swine	240
Twelve fat sheep	120
Two hogsheads of wine	70
Four tuns of beer	32
Two tuns of butter	192

One thousand lbs. of cheese	120
A complete bed	100
A suit of clothes	80
A silver drinking-cup	60
	<hr/>
	2500

People who had been absent from Holland, and whose chance it was to return when this folly was at its maximum, were sometimes led into awkward dilemmas by their ignorance. There is an amusing instance of the kind related in Blainville's *Travels*. A wealthy merchant, who prided himself not a little on his rare tulips, received upon one occasion a very valuable consignment of merchandise from the Levant. Intelligence of its arrival was brought him by a sailor, who presented himself for that purpose at the counting-house, bales of goods of every description. The merchant, to reward him for his news, munificently made him a present of a fine red herring for his breakfast. The sailor had, it appears, a great partiality for onions, and seeing a bulb very like an onion lying upon the counter of this liberal trader, and thinking it, no doubt, very much out of its place among silks and velvets, he slyly seized an opportunity and slipped it into his pocket, as a relish for his herring. He got clear off with his prize, and proceeded to the quay to eat his breakfast. Hardly was his back turned when the merchant missed his valuable *Semper Augustus*, worth three thousand florins, or about 280*l.* sterling. The whole establishment was instantly in an uproar; search was every where made for the precious root, but it was not to be found. Great was the merchant's distress of mind. The search was renewed, but again without success. At last some one thought of the sailor.

The unhappy merchant sprang into the street at the bare suggestion. His alarmed household followed him. The sailor, simple soul! had not thought of concealment. He was found quietly sitting on a coil of ropes, masticating the last morsel of his "*onion*". Little did he dream that he had been eating a breakfast whose cost might have regaled a whole ship's crew for a twelvemonth; or, as the plundered merchant himself expressed it, "might

have sumptuously feasted the Prince of Orange and the whole court of the Stadtholder.” Anthony caused pearls to be dissolved in wine to drink the health of Cleopatra; Sir Richard Whittington was as foolishly magnificent in an entertainment to King Henry V.; and Sir Thomas Gresham drank a diamond dissolved in wine to the health of Queen Elizabeth, when she opened the Royal Exchange; but the breakfast of this roguish Dutchman was as splendid as either. He had an advantage, too, over his wasteful predecessors: *their* gems did not improve the taste or the wholesomeness of *their* wine, while *his* tulip was quite delicious with his red herring. The most unfortunate part of the business for him was, that he remained in prison for some months on a charge of felony preferred against him by the merchant.

Another story is told of an English traveller, which is scarcely less ludicrous. This gentleman, an amateur botanist, happened to see a tulip-root lying in the conservatory of a wealthy Dutchman. Being ignorant of its quality, he took out his penknife, and peeled off its coats, with the view of making experiments upon it. When it was by this means reduced to half its size, he cut it into two equal sections, making all the time many learned remarks on the singular appearances of the unknown bulb. Suddenly, the owner pounced upon him, and, with fury in his eyes, asked him if he knew what he had been doing? “Peeling a most extraordinary onion,” replied the philosopher. “*Hundert tausend duyvel!*” said the Dutchman; “it’s an *Admiral Van der Eyck*.” “Thank you,” replied the traveller, taking out his note-book to make a memorandum of the same; “are these admirals common in your country?” “Death and the devil!” said the Dutchman, seizing the astonished man of science by the collar; “come before the syndic, and you shall see.” In spite of his remonstrances, the traveller was led through the streets followed by a mob of persons. When brought into the presence of the magistrate, he learned, to his consternation, that the root upon which he had been experimentalising was worth four thousand

florins; and, notwithstanding all he could urge in extenuation, he was lodged in prison until he found securities for the payment of this sum.

The demand for tulips of a rare species increased so much in the year 1636, that regular marts for their sale were established on the Stock Exchange of Amsterdam, in Rotterdam, Harlaem, Leyden, Alkmar, Hoorn, and other towns. Symptoms of gambling now became, for the first time, apparent. The stock-jobbers, ever on the alert for a new speculation, dealt largely in tulips, making use of all the means they so well knew how to employ, to cause fluctuations in prices. At first, as in all these gambling mania, confidence was at its height, and every body gained. The tulip-jobbers speculated in the rise and fall of the tulip stocks, and made large profits by buying when prices fell, and selling out when they rose. Many individuals grew suddenly rich. A golden bait hung temptingly out before the people, and one after the other, they rushed to the tulip-marts, like flies around a honey-pot. Every one imagined that the passion for tulips would last for ever, and that the wealthy from every part of the world would send to Holland, and pay whatever prices were asked for them. The riches of Europe would be concentrated on the shores of the Zuyder Zee, and poverty banished from the favoured clime of Holland. Nobles, citizens, farmers, mechanics, sea-men, footmen, maid-servants, even chimney-sweeps and old clothes-women, dabbled in tulips. People of all grades converted their property into cash, and invested it in flowers. Houses and lands were offered for sale at ruinously low prices, or assigned in payment of bargains made at the tulip-mart. Foreigners became smitten with the same frenzy, and money poured into Holland from all directions. The prices of the necessaries of life rose again by degrees: houses and lands, horses and carriages, and luxuries of every sort, rose in value with them, and for some months Holland seemed the very antechamber of Plutus. The operations of the trade became so extensive and so intricate, that it was found necessary to draw up a code of laws for the guidance of the dealers. Notaries and clerks were also appointed, who devoted themselves

exclusively to the interests of the trade. The designation of public notary was hardly known in some towns, that of tulip-notary usurping its place. In the smaller towns, where there was no exchange, the principal tavern was usually selected as the “show-place,” where high and low traded in tulips, and confirmed their bargains over sumptuous entertainments. These dinners were sometimes attended by two or three hundred persons, and large vases of tulips, in full bloom, were placed at regular intervals upon the tables and sideboards for their gratification during the repast.

At last, however, the more prudent began to see that this folly could not last for ever. Rich people no longer bought the flowers to keep them in their gardens, but to sell them again at cent per cent profit. It was seen that somebody must lose fearfully in the end. As this conviction spread, prices fell, and never rose again. Confidence was destroyed, and a universal panic seized upon the dealers. *A* had agreed to purchase ten *Semper Augustines* from *B*, at four thousand florins each, at six weeks after the signing of the contract. *B* was ready with the flowers at the appointed time; but the price had fallen to three or four hundred florins, and *A* refused either to pay the difference or receive the tulips. Defaulters were announced day after day in all the towns of Holland. Hundreds who, a few months previously, had begun to doubt that there was such a thing as poverty in the land, suddenly found themselves the possessors of a few bulbs, which nobody would buy, even though they offered them at one quarter of the sums they had paid for them. The cry of distress resounded every where, and each man accused his neighbour. The few who had contrived to enrich themselves hid their wealth from the knowledge of their fellow-citizens, and invested it in the English or other funds. Many who, for a brief season, had emerged from the humbler walks of life, were cast back into their original obscurity. Substantial merchants were reduced almost to beggary, and many a representative of a noble line saw the fortunes of his house ruined beyond redemption.

When the first alarm subsided, the tulip-holders in the several towns held public meetings to devise what measures, were best to be taken to restore public credit. It was generally agreed, that deputies should be sent from all parts to Amsterdam, to consult with the government upon some remedy for the evil. The government at first refused to interfere, but advised the tulip-holders to agree to some plan among themselves. Several meetings were held for this purpose; but no measure could be devised likely to give satisfaction to the deluded people, or repair even a slight portion of the mischief that had been done. The language of complaint and reproach was in every body's mouth, and all the meetings were of the most stormy character. At last, however, after much bickering and ill-will, it was agreed, at Amsterdam, by the assembled deputies, that all contracts made in the height of the mania, or prior to the month of November 1636, should be declared null and void, and that, in those made after that date, purchasers should be freed from their engagements, on paying ten per cent to the vendor. This decision gave no satisfaction. The vendors who had their tulips on hand were, of course, discontented, and those who had pledged themselves to purchase, thought themselves hardly treated. Tulips which had, at one time, been worth six thousand florins, were now to be procured for five hundred; so that the composition of ten per cent was one hundred florins more than the actual value. Actions for breach of contract were threatened in all the courts of the country; but the latter refused to take cognisance of gambling transactions.

The matter was finally referred to the Provincial Council at the Hague, and it was confidently expected that the wisdom of this body would invent some measure by which credit should be restored. Expectation was on the stretch for its decision, but it never came. The members continued to deliberate week after week, and at last, after thinking about it for three months, declared that they could offer no final decision until they had more information. They advised, however, that, in the mean time, every vendor should, in the presence of witnesses, offer the tulips *in natura* to

the purchaser for the sums agreed upon. If the latter refused to take them, they might be put up for sale by public auction, and the original contractor held responsible for the difference between the actual and the stipulated price. This was exactly the plan recommended by the deputies, and which was already shewn to be of no avail. There was no court in Holland which would enforce payment. The question was raised in Amsterdam, but the judges unanimously refused to interfere, on the ground that debts contracted in gambling were no debts in law.

Thus the matter rested. To find a remedy was beyond the power of the government. Those who were unlucky enough to have had stores of tulips on hand at the time of the sudden reaction were left to bear their ruin as philosophically as they could; those who had made profits were allowed to keep them; but the commerce of the country suffered a severe shock, from which it was many years ere it recovered.

The example of the Dutch was imitated to some extent in England. In the year 1636 tulips were publicly sold in the Exchange of London, and the jobbers exerted themselves to the utmost to raise them to the fictitious value they had acquired in Amsterdam. In Paris also the jobbers strove to create a tulipomania. In both cities they only partially succeeded. However, the force of example brought the flowers into great favour, and amongst a certain class of people tulips have ever since been prized more highly than any other flowers of the field. The Dutch are still notorious for their partiality to them, and continue to pay higher prices for them than any other people. As the rich Englishman boasts of his fine race-horses or his old pictures, so does the wealthy Dutchman vaunt him of his tulips.

In England, in our day, strange as it may appear, a tulip will produce more money than an oak. If one could be found, *rara in terris*, and black as the black swan of Juvenal, its price would equal that of a dozen acres of standing corn. In Scotland, towards the close of the seventeenth century, the highest price for tulips, according to the authority of a writer in the supplement to the third edition of the *Encyclopedia Britannica*, was ten

guineas. Their value appears to have diminished from that time till the year 1769, when the two most valuable species in England were the *Don Quevedo* and the *Valentinier*, the former of which was worth two guineas and the latter two guineas and a half. These prices appear to have been the minimum. In the year 1800, a common price was fifteen guineas for a single bulb. In 1835, a bulb of the species called the Miss Fanny Kemble was sold by public auction in London for seventy-five pounds. Still more remarkable was the price of a tulip in the possession of a gardener in the King's Road, Chelsea;—in his catalogues it was labelled at two hundred guineas.



THE ALCHEMISTS;

OR

Searchers for the Philosopher's Stone and the Water of Life.

Mercury (loquitur). The mischief a secret any of them know, above the consuming of coals and drawing of usquebaugh! howsoever they may pretend, under the specious names of Geber, Arnold, Lulli, or bombast of Hohenheim, to commit miracles in art, and treason against nature! As if the title of philosopher, that creature of glory, were to be fetched out of a furnace! I am their crude and their sublimate, their precipitate and their unctions; their male and their female, sometimes their hermaphrodite—what they list to style me! They will calcine you a grave matron, as it might be a mother of the maids, and spring up a young virgin out of her ashes, as fresh as a phoenix; lay you an old courtier on the coals, like a sausage or a bloat-herring, and, after they have broiled him enough, blow a soul into him with a pair of bellows! See, they begin to muster again, and draw their forces out against me! The genius of the place defend me!—BEN JONSON'S *Masque: Mercury vindicated from the Alchemists.*

DISSATISFACTION with his lot seems to be the characteristic of man in all ages and climates. So far, however, from being an evil, as at first might be supposed, it has been the great civiliser of our race; and has tended, more than any thing else, to raise us above the condition of the brutes. But the same discontent which has been the source of all improvement, has been the parent of no small progeny of follies and absurdities; to trace these latter is our present object. Vast as the subject appears, it is easily reducible within such limits as will make it comprehensive without being wearisome, and render its study both instructive and amusing.

Three causes especially have excited the discontent of mankind; and, by impelling us to seek for remedies for the irremediable, have bewildered us in a maze of madness and error. These are death, toil, and ignorance of the future—the doom of man upon this sphere, and for which he shews his antipathy by his love of life, his longing for abundance, and his craving curiosity to pierce the secrets of the days to come. The first has led many to imagine that they might find means to avoid death, or failing in this, that they might, nevertheless, so prolong existence as to reckon it by centuries instead of units. From this sprang the search, so long continued and still pursued, for the *elixir vitæ*, or *water of life*, which has led thousands to pretend to it and millions to believe in it. From the second sprang the search for the philosopher's stone, which was to create plenty by changing all metals into gold; and from the third, the false sciences of astrology, divination, and their divisions of necromancy, chiromancy, augury, with all their train of signs, portents, and omens.

In tracing the career of the erring philosophers, or the wilful cheats, who have encouraged or preyed upon the credulity of mankind, it will simplify and elucidate the subject, if we divide it into three classes: the first comprising alchemists, or those in general who have devoted themselves to the discovering of the philosopher's stone and the water of life; the second comprising astrologers, necromancers, sorcerers, geomancers, and all those who pretended to discover futurity; and the third consisting of the dealers in charms, amulets, philters, universal-panacea mongers, touchers for the evil, seventh sons of a seventh son, sympathetic powder compounders, homœopathists, animal magnetisers, and all the motley tribe of quacks, empirics, and charlatans.

But in narrating the career of such men, it will be found that many of them united several or all of the functions just mentioned; that the alchemist was a fortune-teller, or a necromancer—that he pretended to cure all maladies by touch or charm, and to work miracles of every kind. In the dark and early ages of European history this is more especially the case.

Even as we advance to more recent periods, we shall find great difficulty in separating the characters. The alchemist seldom confined himself strictly to his pretended science—the sorcerer and necromancer to theirs, or the medical charlatan to his. Beginning with alchemy, some confusion of these classes is unavoidable; but the ground will clear for us as we advance.

Let us not, in the pride of our superior knowledge, turn with contempt from the follies of our predecessors. The study of the errors into which great minds have fallen in the pursuit of truth can never be un instructive. As the man looks back to the days of his childhood and his youth, and recalls to his mind the strange notions and false opinions that swayed his actions at that time, that he may wonder at them; so should society, for its edification, look back to the opinions which governed the ages fled. He is but a superficial thinker who would despise and refuse to hear of them merely because they are absurd. No man is so wise but that he may learn some wisdom from his past errors, either of thought or action; and no society has made such advances as to be capable of no improvement from the retrospect of its past folly and credulity. And not only is such a study instructive: he who reads for amusement only will find no chapter in the annals of the human mind more amusing than this. It opens out the whole realm of fiction—the wild, the fantastic, and the wonderful, and all the immense variety of things “that are not, and cannot be; but that have been imagined and believed.”

For more than a thousand years the art of alchemy captivated many noble spirits, and was believed in by millions. Its origin is involved in obscurity. Some of its devotees have claimed for it an antiquity coeval with the creation of man himself, others, again, would trace it no further back than the time of Noah. Vincent de Beauvais argues, indeed, that all the antediluvians must have possessed a knowledge of alchemy; and

particularly cites Noah as having been acquainted with the *elixir vitæ*, or he could not have lived to so prodigious an age, and have begotten children when upwards of five hundred. Lenglet du Fresnoy, in his *History of the Hermetic Philosophy*, says, "Most of them pretended that Shem, or Chem, the son of Noah, was an adept in the art, and thought it highly probable that the words *chemistry* and *alchemy* are both derived from his name." Others say, the art was derived from the Egyptians, amongst whom it was first founded by Hermes Trismegistus. Moses, who is looked upon as a first-rate alchemist, gained his knowledge in Egypt; but he kept it all to himself, and would not instruct the children of Israel in its mysteries. All the writers upon alchemy triumphantly cite the story of the golden calf, in the 32d chapter of Exodus, to prove that this great lawgiver was an adept, and could make or unmake gold at his pleasure. It is recorded, that Moses was so wrath with the Israelites for their idolatry, "that he took the calf which they had made, and burned it in the fire, and ground it to powder, and strewed it upon the water, and made the children of Israel drink of it." This, say the alchemists, he never could have done had he not been in possession of the philosopher's stone; by no other means could he have made the powder of gold float upon the water. But we must leave this knotty point for the consideration of the adepts in the art, if any such there be, and come to more modern periods of its history. The Jesuit, Father Martini, in his *Historia Sinica*, says, it was practised by the Chinese two thousand five hundred years before the birth of Christ; but his assertion, being unsupported, is worth nothing. It would appear, however, that pretenders to the art of making gold and silver existed in Rome in the first centuries after the Christian era, and that, when discovered, they were liable to punishment as knaves and impostors. At Constantinople, in the fourth century, the transmutation of metals was very generally believed in, and many of the Greek ecclesiastics wrote treatises upon the subject. Their names are preserved, and some notice of their works given, in the third volume of Lenglet du Fresnoy's *History of the Hermetic Philosophy*. Their

notion appears to have been, that all metals were composed of two substances; the one, metallic earth; and the other, a red inflammable matter, which they called sulphur. The pure union of these substances formed gold; but other metals were mixed with and contaminated by various foreign ingredients. The object of the philosopher's stone was to dissolve or neutralise all these ingredients, by which iron, lead, copper, and all metals would be transmuted into the original gold. Many learned and clever men wasted their time, their health, and their energies, in this vain pursuit; but for several centuries it took no great hold upon the imagination of the people. The history of the delusion appears, in a manner, lost from this time till the eighth century, when it appeared amongst the Arabians. From this period it becomes easier to trace its progress. A master then appeared, who was long looked upon as the father of the science, and whose name is indissolubly connected with it.

GEBER.

Of this philosopher, who devoted his life to the study of alchymy, but few particulars are known. He is thought to have lived in the year 730. His true name was Abou Moussah Djafar, to which was added Al Sofi, or "The Wise," and he was born at Houran, in Mesopotamia.²⁸ Some have thought he was a Greek, others a Spaniard, and others a prince of Hindostan; but of all the mistakes which have been made respecting him, the most ludicrous was that made by the French translator of Sprenger's *History of Medicine*, who thought, from the sound of his name, that he was a German, and rendered it as the "Donnateur," or Giver. No details of his life are known; but it is asserted, that he wrote more than five hundred works upon the philosopher's stone and the water of life. He was a great enthusiast in his art, and compared the incredulous to little children shut up in a narrow room, without windows or aperture, who, because they saw nothing beyond, denied the existence of the great globe itself. He thought that a

preparation of gold would cure all maladies, not only in man, but in the inferior animals and plants. He also imagined that all the metals laboured under disease, with the exception of gold, which was the only one in perfect health. He affirmed, that the secret of the philosopher's stone had been more than once discovered; but that the ancient and wise men who had hit upon it would never, by word or writing, communicate it to men, because of their unworthiness and incredulity.²⁹ But the life of Geber, though spent in the pursuit of this vain chimera, was not altogether useless. He stumbled upon discoveries which he did not seek; and science is indebted to him for the first mention of corrosive sublimate, the red oxide of mercury, nitric acid, and the nitrate of silver.³⁰

For more than two hundred years after the death of Geber, the Arabian philosophers devoted themselves to the study of alchymy, joining with it that of astrology. Of these the most celebrated was

ALFARABI.

Alfarabi flourished at the commencement of the tenth century, and enjoyed the reputation of being one of the most learned men of his age. He spent his life in travelling from country to country, that he might gather the opinions of philosophers upon the great secrets of nature. No danger dismayed him; no toil wearied him of the pursuit. Many sovereigns endeavoured to retain him at their courts; but he refused to rest until he had discovered the great object of his life—the art of preserving it for centuries, and of making gold as much as he needed. This wandering mode of life at last proved fatal to him. He had been on a visit to Mecca, not so much for religious as for philosophical purposes, when, returning through Syria, he stopped at the court of the Sultan Seifeddoulet, who was renowned as the patron of learning. He presented himself in his travelling attire in the presence of that monarch and his courtiers; and, without invitation, coolly sat himself down on the sofa beside the prince. The

courtiers and wise men were indignant; and the sultan, who did not know the intruder, was at first inclined to follow their example. He turned to one of his officers, and ordered him to eject the presumptuous stranger from the room; but Alfarabi, without moving, dared them to lay hands upon him; and, turning himself calmly to the prince, remarked, that he did not know who was his guest, or he would treat him with honour, not with violence. The sultan, instead of being still further incensed, as many potentates would have been, admired his coolness; and, requesting him to sit still closer to him on the sofa, entered into a long conversation with him upon science and divine philosophy. All the court were charmed with the stranger. Questions for discussion were propounded, on all of which he shewed superior knowledge. He convinced every one who ventured to dispute with him; and spoke so eloquently upon the science of alchymy, that he was at once recognised as only second to the great Geber himself. One of the doctors present inquired whether a man who knew so many sciences was acquainted with music? Alfarabi made no reply, but merely requested that a lute should be brought him. The lute was brought; and he played such ravishing and tender melodies, that all the court were melted into tears. He then changed his theme, and played airs so sprightly, that he set the grave philosophers, sultan and all, dancing as fast as their legs could carry them. He then sobered them again by a mournful strain, and made them sob and sigh as if broken-hearted. The sultan, highly delighted with his powers, entreated him to stay, offering him every inducement that wealth, power, and dignity could supply; but the alchymist resolutely refused, it being decreed, he said, that he should never repose till he had discovered the philosopher's stone. He set out accordingly the same evening, and was murdered by some thieves in the deserts of Syria. His biographers give no further particulars of his life beyond mentioning that he wrote several valuable treatises on his art, all of which, however, have been lost. His death happened in the year 954.

AVICENNA.

Avicenna, whose real name was Ebn Cinna, another great alchemist, was born at Bokhara in 980. His reputation as a physician and a man skilled in all sciences was so great, that the Sultan Magdal Douleth resolved to try his powers in the great science of government. He was accordingly made Grand Vizier of that prince, and ruled the state with some advantage; but in a science still more difficult, he failed completely. He could not rule his own passions, but gave himself up to wine and women, and led a life of shameless debauchery. Amid the multifarious pursuits of business and pleasure, he nevertheless found time to write seven treatises upon the philosopher's stone, which were for many ages looked upon as of great value by pretenders to the art. It is rare that an eminent physician as Avicenna appears to have been, abandons himself to sensual gratification; but so completely did he become enthralled in the course of a few years, that he was dismissed from his high office, and died shortly afterwards of premature old age and a complication of maladies, brought on by debauchery. His death took place in the year 1036. After his time few philosophers of any note in Arabia are heard of as devoting themselves to the study of alchemy; but it began shortly afterwards to attract greater attention in Europe. Learned men in France, England, Spain, and Italy, expressed their belief in the science, and many devoted their whole energies to it. In the twelfth and thirteenth centuries especially, it was extensively pursued, and some of the brightest names of that age are connected with it. Among the most eminent of them are

ALBERTUS MAGNUS AND THOMAS AQUINAS.

The first of these philosophers was born in the year 1193, of a noble family at Lawingen, in the Duchy of Neuburg, on the Danube. For the first thirty years of his life he appeared remarkably dull and stupid, and it was feared by every one that no good could come of him. He entered a

Dominican monastery at an early age; but made so little progress in his studies, that he was more than once upon the point of abandoning them in despair, but he was endowed with extraordinary perseverance. As he advanced to middle age, his mind expanded, and he learned whatever he applied himself to with extreme facility. So remarkable a change was not in that age to be accounted for but by a miracle. It was asserted and believed that the Holy Virgin, touched with his great desire to become learned and famous, took pity upon his incapacity, and appeared to him in the cloister where he sat almost despairing, and asked him whether he wished to excel in philosophy or divinity. He chose philosophy, to the chagrin of the Virgin, who reproached him in mild and sorrowful accents that he had not made a better choice. She, however, granted his request, that he should become the most excellent philosopher of the age; but set this drawback to his pleasure, that he should relapse, when at the height of his fame, into his former incapacity and stupidity. Albertus never took the trouble to contradict the story, but prosecuted his studies with such unremitting zeal, that his reputation speedily spread over all Europe. In the year 1244, the celebrated Thomas Aquinas placed himself under his tuition. Many extraordinary stories are told of the master and his pupil. While they paid all due attention to other branches of science, they never neglected the pursuit of the philosopher's stone and the *elixir vitæ*. Although they discovered neither, it was believed that Albert had seized some portion of the secret of life, and found means to animate a brazen statue, upon the formation of which, under proper conjunctions of the planets, he had been occupied many years of his life. He and Thomas Aquinas completed it together, endowed it with the faculty of speech, and made it perform the functions of a domestic servant. In this capacity it was exceedingly useful; but, through some defect in the machinery, it chattered much more than was agreeable to either philosopher. Various remedies were tried to cure it of its garrulity, but in vain; and one day, Thomas Aquinas was so enraged at the noise it made when he was in the midst of a mathematical problem,

that he seized a ponderous hammer and smashed it to pieces.³¹ He was sorry afterwards for what he had done, and was reprov'd by his master for giving way to his anger, so unbecoming in a philosopher. They made no attempt to re-animate the statue.



ALBERTUS MAGNUS.

Such stories as these shew the spirit of the age. Every great man who attempted to study the secrets of nature was thought a magician; and it is not to be wondered at that, when philosophers themselves pretended to discover an elixir for conferring immortality, or a red stone which was to create boundless wealth, that popular opinion should have enhanced upon their pretensions, and have endowed them with powers still more miraculous. It was believed of Albertus Magnus that he could even change the course of the seasons, a feat which the many thought less difficult than the discovery of the grand elixir. Albertus was desirous of obtaining a piece of ground on which to build a monastery in the neighbourhood of Cologne. The ground belonged to William Count of Holland and King of the Romans, who for some reason or other did not wish to part with it. Albertus is reported to have gained it by the following extraordinary method: He invited the prince as he was passing through Cologne to a magnificent entertainment prepared for him and all his court. The prince accepted it, and repaired with a lordly retinue to the residence of the sage. It was in the midst of winter, the Rhine was frozen over, and the cold was so bitter, that the knights could not sit on horseback without running the risk of losing their toes by the frost. Great, therefore, was their surprise, on arriving at Albert's house, to find that the repast was spread in his garden, in which the snow had drifted to the depth of several feet. The earl in high

dudgeon remounted his steed, but Albert at last prevailed upon him to take his seat at the table. He had no sooner done so, than the dark clouds rolled away from the sky—a warm sun shone forth—the cold north wind veered suddenly round and blew a mild breeze from the south—the snows melted away—the ice was unbound upon the streams, and the trees put forth their green leaves and their fruit—flowers sprang up beneath their feet, while larks, nightingales, blackbirds, cuckoos, thrushes, and every sweet song-bird sang hymns from every tree. The earl and his attendants wondered greatly; but they ate their dinner, and in recompense for it, Albert got his piece of ground to build a convent on. He had not, however, shewn them all his power. Immediately that the repast was over, he gave the word, and dark clouds obscured the sun—the snow fell in large flakes—the singing-birds fell dead—the leaves dropped from the trees, and the winds blew so cold and howled so mournfully, that the guests wrapped themselves up in their thick cloaks, and retreated into the house to warm themselves at the blazing fire in Albert’s kitchen.³²

Thomas Aquinas also could work wonders as well as his master. It is related of him that he lodged in a street at Cologne, where he was much annoyed by the incessant clatter made by the horses’ hoofs, as they were led through it daily to exercise by their grooms. He had entreated the latter to select some other spot, where they might not disturb a philosopher; but the grooms turned a deaf ear to all his solicitations. In this emergency he had recourse to the aid of magic. He constructed a small horse of bronze, upon which he inscribed certain cabalistic characters, and buried it at midnight in the midst of the highway. The next morning a troop of grooms came riding along as usual; but the horses, as they arrived at the spot where the magic horse was buried, reared and plunged violently—their nostrils distended with terror—their manes grew erect, and the perspiration ran down their sides in streams. In vain the riders applied the spur—in vain they coaxed or threatened, the animals would not pass the spot. On the following day their success was no better. They were at length

compelled to seek another spot for their exercise, and Thomas Aquinas was left in peace.³³

Albertus Magnus was made Bishop of Ratisbon in 1259; but he occupied the see only four years, when he resigned, on the ground that its duties occupied too much of the time which he was anxious to devote to philosophy. He died in Cologne in 1280, at the advanced age of eighty-seven. The Dominican writers deny that he ever sought the philosopher's stone, but his treatise upon minerals sufficiently proves that he did.

ARTEPHIUS.

Artephius, a name noted in the annals of alchymy, was born in the early part of the twelfth century. He wrote two famous treatises; the one upon the philosopher's stone, and the other on the art of prolonging human life. In the latter he vaunts his great qualifications for instructing mankind on such a matter, as he was at that time in the thousand and twenty-fifth year of his age! He had many disciples who believed in his extreme age, and who attempted to prove that he was Apollonius of Tyana, who lived soon after the advent of Jesus Christ, and the particulars of whose life and pretended miracles have been so fully described by Philostratus. He took good care never to contradict a story which so much increased the power he was desirous of wielding over his fellow-mortals. On all convenient occasions, he boasted of it; and having an excellent memory, a fertile imagination, and a thorough knowledge of all existing history, he was never at a loss for an answer when questioned as to the personal appearance, the manners, or the character of the great men of antiquity. He also pretended to have found the philosopher's stone; and said that, in search of it, he had descended to hell, and seen the devil sitting on a throne of gold, with a legion of imps and fiends around him. His works on alchymy have been translated into French, and were published in Paris in 1609 or 1610.

ALAIN DE LISLE.

Contemporary with Albertus Magnus was Alain de Lisle of Flanders, who was named, from his great learning, the “universal doctor.” He was thought to possess a knowledge of all the sciences, and, like Artepheus, to have discovered the *elixir vitæ*. He became one of the friars of the abbey of Citeaux, and died in 1298, aged about one hundred and ten years. It was said of him that he was at the point of death when in his fiftieth year, but that the fortunate discovery of the elixir enabled him to add sixty years to his existence. He wrote a commentary on the prophecies of Merlin.

ARNOLD DE VILLENEUVE.

This philosopher has left a much greater reputation. He was born in the year 1245, and studied medicine with great success in the university of Paris. He afterwards travelled for twenty years in Italy and Germany, where he made acquaintance with Pietro d’Apone, a man of a character akin to his own, and addicted to the same pursuits. As a physician, he was thought, in his own lifetime, to be the most able the world had ever seen. Like all the learned men of that day, he dabbled in astrology and alchymy, and was thought to have made immense quantities of gold from lead and copper. When Pietro d’Apone was arrested in Italy, and brought to trial as a sorcerer, a similar accusation was made against Arnold; but he managed to leave the country in time, and escape the fate of his unfortunate friend. He lost some credit by predicting the end of the world, but afterwards regained it. The time of his death is not exactly known; but it must have been prior to the year 1311, when Pope Clement V. wrote a circular letter to all the clergy of Europe who lived under his obedience, praying them to use their utmost efforts to discover the famous treatise of Arnold on *The Practice of Medicine*. The author had promised, during his lifetime, to make a present of the work to the Holy See, but died without fulfilling it.



ARNOLD DE VILLENEUVE.

In a very curious work by Monsieur Longeville Harcouet, entitled *The History of the Persons who have lived several centuries and then grown young again*, there is a receipt, said to have been given by Arnold de Villeneuve, by means of which any one might prolong his life for a few hundred years or so. In the first place, say Arnold and Monsieur Harcouet, “the person intending so to prolong his life must rub himself well, two or three times a week, with the juice or marrow of cassia (*moëlle de la casse*). Every night, upon going to bed, he must put upon his heart a plaster, composed of a certain quantity of oriental saffron, red rose-leaves, sandalwood, aloes, and amber, liquified in oil of roses and the best white wax. In the morning, he must take it off, and enclose it carefully in a leaden box till the next night, when it must be again applied. If he be of a sanguine temperament, he shall take sixteen chickens; if phlegmatic, twenty-five; and if melancholy, thirty, which he shall put into a yard where the air and the water are pure. Upon these he is to feed, eating one a day; but previously the chickens are to be fattened by a peculiar method, which will impregnate their flesh with the qualities that are to produce longevity in the eater. Being deprived of all other nourishment till they are almost dying of hunger, they are to be fed upon broth made of serpents and vinegar, which broth is to be thickened with wheat and bran.” Various ceremonies are to be performed in the cooking of this mess, which those may see in the book of M. Harcouet who are at all interested in the matter; and the

chickens are to be fed upon it for two months. They are then fit for table, and are to be washed down with moderate quantities of good white wine or claret. This regimen is to be followed regularly every seven years, and any one may live to be as old as Methuselah! It is right to state that M. Harcouet has but little authority for attributing this precious composition to Arnold of Villeneuve. It is not found in the collected works of that philosopher; but was first brought to light by a M. Poirier, at the commencement of the sixteenth century, who asserted that he had discovered it in MS. in the undoubted writing of Arnold.

PIETRO D'APONE.

This unlucky sage was born at Apone, near Padua, in the year 1250. Like his friend Arnold de Villeneuve, he was an eminent physician, and a pretender to the arts of astrology and alchymy. He practised for many years in Paris, and made great wealth by killing and curing, and telling fortunes. In an evil day for him, he returned to his own country, with the reputation of being a magician of the first order. It was universally believed that he had drawn seven evil spirits from the infernal regions, whom he kept enclosed in seven crystal vases until he required their services, when he sent them forth to the ends of the earth to execute his pleasure. One spirit excelled in philosophy; a second, in alchymy; a third, in astrology; a fourth, in physic; a fifth, in poetry; a sixth, in music; and the seventh, in painting: and whenever Pietro wished for information or instruction in any of these arts, he had only to go to his crystal vase and liberate the presiding spirit. Immediately all the secrets of the art were revealed to him; and he might, if it pleased him, excel Homer in poetry, Apelles in painting, or Pythagoras himself in philosophy. Although he could make gold out of brass, it was said of him that he was very sparing of his powers in that respect, and kept himself constantly supplied with money by other and less creditable means. Whenever he disbursed gold, he muttered a certain charm, known

only to himself, and next morning the gold was safe again in his own possession. The trader to whom he gave it might lock it in his strong box and have it guarded by a troop of soldiers, but the charmed metal flew back to its old master. Even if it were buried in the earth, or thrown into the sea, the dawn of the next morning would behold it in the pockets of Pietro. Few people, in consequence, liked to have dealings with such a personage, especially for gold. Some, bolder than the rest, thought that his power did not extend over silver; but, when they made the experiment, they found themselves mistaken. Bolts and bars could not restrain it, and it sometimes became invisible in their very hands, and was whisked through the air to the purse of the magician. He necessarily acquired a very bad character; and, having given utterance to some sentiments regarding religion which were the very reverse of orthodox, he was summoned before the tribunals of the Inquisition to answer for his crimes as a heretic and a sorcerer. He loudly protested his innocence, even upon the rack, where he suffered more torture than nature could support. He died in prison ere his trial was concluded, but was afterwards found guilty. His bones were ordered to be dug up and publicly burned. He was also burned in effigy in the streets of Padua.

RAYMOND LULLI.



RAYMOND LULLI.

While Arnold de Villeneuve and Pietro d'Apone flourished in France and Italy, a more celebrated adept than either appeared in Spain. This was Raymond Lulli, a name which stands in the first rank among the alchemists. Unlike many of his predecessors, he made no pretensions to astrology or necromancy; but, taking Geber for his model, studied intently the nature and composition of metals, without reference to charms, incantations, or any foolish ceremonies. It was not, however, till late in life that he commenced his study of the art. His early and middle age were spent in a different manner, and his whole history is romantic in the extreme. He was born of an illustrious family, in Majorca, in the year 1235. When that island was taken from the Saracens by James I. king of Aragon, in 1230, the father of Raymond, who was originally of Catalonia, settled there, and received a considerable appointment from the crown. Raymond married at an early age; and, being fond of pleasure, he left the solitudes of his native isle, and passed over with his bride into Spain. He was made Grand Seneschal at the court of King James, and led a gay life for several years. Faithless to his wife, he was always in the pursuit of some new beauty, till his heart was fixed at last by the lovely but unkind Ambrosia de Castello. This lady, like her admirer, was married; but, unlike him, was faithful to her vows, and treated all his solicitations with disdain. Raymond was so enamoured, that repulse only increased his flame; he lingered all night under her windows, wrote passionate verses in her praise, neglected his affairs, and made himself the butt of all the courtiers. One day, while watching under her lattice, he by chance caught sight of her bosom, as her neckerchief was blown aside by the wind. The fit of inspiration came over him, and he sat down and composed some tender stanzas upon the subject, and sent them to the lady. The fair Ambrosia had never before condescended to answer his letters; but she replied to this. She told him that she could never listen to his suit; that it was unbecoming in a wise man to fix his thoughts, as he had done, on any other than his God; and

entreated him to devote himself to a religious life, and conquer the unworthy passion which he had suffered to consume him. She, however, offered, if he wished it, to shew him the *fair* bosom which had so captivated him. Raymond was delighted. He thought the latter part of this epistle but ill corresponded with the former, and that Ambrosia, in spite of the good advice she gave him, had at last relented, and would make him as happy as he desired. He followed her about from place to place, entreating her to fulfil her promise: but still Ambrosia was cold, and implored him with tears to importune her no longer; for that she never could be his, and never would, if she were free to-morrow. "What means your letter, then?" said the despairing lover. "I will shew you!" replied Ambrosia, who immediately uncovered her bosom, and exposed to the eyes of her horror-stricken admirer a large cancer which had extended to both breasts. She saw that he was shocked; and, extending her hand to him, she prayed him once more to lead a religious life, and set his heart upon the Creator, and not upon the creature. He went home an altered man. He threw up, on the morrow, his valuable appointment at the court, separated from his wife, and took a farewell of his children, after dividing one-half of his ample fortune among them. The other half he shared among the poor. He then threw himself at the foot of a crucifix, and devoted himself to the service of God, vowing, as the most acceptable atonement for his errors, that he would employ the remainder of his days in the task of converting the Mussulmans to the Christian religion. In his dreams he saw Jesus Christ, who said to him, "Raymond! Raymond! follow me!" The vision was three times repeated, and Raymond was convinced that it was an intimation direct from heaven. Having put his affairs in order, he set out on a pilgrimage to the shrine of St. James of Compostello, and afterwards lived for ten years in solitude amid the mountains of Aranda. Here he learned the Arabic, to qualify himself for his mission of converting the Mahometans. He also studied various sciences, as taught in the works of the learned men of the East, and

first made acquaintance with the writings of Geber, which were destined to exercise so much influence over his future life.

At the end of this probation, and when he had entered his fortieth year, he emerged from his solitude into more active life. With some remains of his fortune, which had accumulated during his retirement, he founded a college for the study of Arabic, which was approved of by the pope, with many commendations upon his zeal and piety. At this time he narrowly escaped assassination from an Arabian youth whom he had taken into his service. Raymond had prayed to God, in some of his accesses of fanaticism, that he might suffer martyrdom in his holy cause. His servant had overheard him: and, being as great a fanatic as his master, he resolved to gratify his wish, and punish him, at the same time, for the curses which he incessantly launched against Mahomet and all who believed in him, by stabbing him to the heart. He therefore aimed a blow at his master as he sat one day at table; but the instinct of self-preservation being stronger than the desire of martyrdom, Raymond grappled with his antagonist, and overthrew him. He scorned to take his life himself; but handed him over to the authorities of the town, by whom he was afterwards found dead in his prison.

After this adventure Raymond travelled to Paris, where he resided for some time, and made the acquaintance of Arnold de Villeneuve. From him he probably received some encouragement to search for the philosopher's stone, as he began from that time forth to devote less of his attention to religious matters, and more to the study of alchymy. Still he never lost sight of the great object for which he lived—the conversion of the Mahometans—and proceeded to Rome, to communicate personally with Pope John XXI. on the best measures to be adopted for that end. The Pope gave him encouragement in words, but failed to associate any other persons with him in the enterprise which he meditated. Raymond, therefore, set out for Tunis alone, and was kindly received by many Arabian philosophers, who had heard of his fame as a professor of alchymy. If he had stuck to alchymy

while in their country, it would have been well for him; but he began cursing Mahomet, and got himself into trouble. While preaching the doctrines of Christianity in the great bazaar of Tunis, he was arrested and thrown into prison. He was shortly afterwards brought to trial, and sentenced to death. Some of his philosophic friends interceded hard for him, and he was pardoned upon condition that he left Africa immediately and never again set foot in it. If he was found there again, no matter what his object might be, or whatever length of time might intervene, his original sentence would be carried into execution. Raymond was not at all solicitous of martyrdom when it came to the point, whatever he might have been when there was no danger, and he gladly accepted his life upon these conditions, and left Tunis with the intention of proceeding to Rome. He afterwards changed his plan, and established himself at Milan, where, for a length of time, he practised alchemy, and some say astrology, with great success.

Most writers who believed in the secrets of alchemy, and who have noticed the life of Raymond Lulli, assert, that while in Milan, he received letters from Edward King of England, inviting him to settle in his states. They add that Lulli gladly accepted the invitation, and had apartments assigned for his use in the Tower of London, where he refined much gold; superintended the coinage of "rose-nobles," and made gold out of iron, quicksilver, lead, and pewter, to the amount of six millions. The writers in the *Biographie Universelle*, an excellent authority in general, deny that Raymond was ever in England, and say, that in all these stories of his wondrous powers as an alchemist, he has been mistaken for another Raymond, a Jew of Tarragona. Naudé, in his *Apologie*, says, simply, "that six millions were given by Raymond Lulli to King Edward, to make war against the Turks and other infidels:" not that he transmuted so much metal into gold; but, as he afterwards adds, that he advised Edward to lay a tax upon wool, which produced that amount. To shew that Raymond went to England, his admirers quote a work attributed to him, *De*

Transmutatione Animæ Metallorum, in which he expressly says that he was in England at the intercession of the king.³⁴ The hermetic writers are not agreed whether it was Edward I. or Edward II. who invited him over; but, by fixing the date of his journey in 1312, they make it appear that it was Edward II. Edmond Dickenson, in his work on the *Quintessences of the Philosophers*, says, that Raymond worked in Westminster Abbey, where, a long time after his departure, there was found in the cell which he had occupied a great quantity of golden dust, of which the architects made a great profit. In the biographical sketch of John Cremer, Abbot of Westminster, given by Lenglet, it is said that it was chiefly through his instrumentality that Raymond came to England. Cremer had been himself for thirty years occupied in the vain search for the philosopher's stone, when he accidentally met Raymond in Italy, and endeavoured to induce him to communicate his grand secret. Raymond told him that he must find it for himself, as all great alchymists had done before him. Cremer, on his return to England, spoke to King Edward in high terms of the wonderful attainments of the philosopher, and a letter of invitation was forthwith sent him. Robert Constantinus, in the *Nomenclator Scriptorum Medicorum*, published in 1515, says, that after a great deal of research, he found that Raymond Lulli resided for some time in London, and that he actually made gold, by means of the philosopher's stone, in the Tower; that he had seen the golden pieces of his coinage, which were still named in England the nobles of Raymond, or rose-nobles. Lulli himself appears to have boasted that he made gold; for, in his well-known *Testamentum*, he states that he converted no less than fifty thousand pounds weight of quicksilver, lead, and pewter into that metal.³⁵ It seems highly probable that the English king, believing in the extraordinary powers of the alchymist, invited him to England to make test of them, and that he was employed in refining gold and in coining. Camden, who is not credulous in matters like these, affords his countenance to the story of his coinage of nobles; and there is nothing at all wonderful in the fact of a man famous for his knowledge of metals

being employed in such a capacity. Raymond was, at this time, an old man, in his seventy-seventh year, and somewhat in his dotage. He was willing enough to have it believed that he had discovered the grand secret, and supported the rumour rather than contradicted it. He did not long remain in England, but returned to Rome to carry out the projects which were nearer to his heart than the profession of alchymy. He had proposed them to several successive popes with little or no success. The first was a plan for the introduction of the oriental languages into all the monasteries of Europe; the second, for the reduction into one of all the military orders, that, being united, they might move more efficaciously against the Saracens; and the third, that the sovereign pontiff should forbid the works of Averroes to be read in the schools, as being more favourable to Mahometanism than to Christianity. The pope did not receive the old man with much cordiality; and, after remaining for about two years in Rome, he proceeded once more to Africa, alone and unprotected, to preach the Gospel of Jesus. He landed at Bona in 1314, and so irritated the Mahometans by cursing their prophet, that they stoned him, and left him for dead on the sea-shore. He was found some hours afterwards by a party of Genoese merchants, who conveyed him on board their vessel, and sailed towards Majorca. The unfortunate man still breathed, but could not articulate. He lingered in this state for some days, and expired just as the vessel arrived within sight of his native shores. His body was conveyed with great pomp to the church of St. Eulalia, at Palma, where a public funeral was instituted in his honour. Miracles were afterwards said to have been worked at his tomb.

Thus ended the career of Raymond Lulli, one of the most extraordinary men of his age; and, with the exception of his last boast about the six millions of gold, the least inclined to quackery of any of the professors of alchymy. His writings were very numerous, and include nearly five hundred volumes, upon grammar, rhetoric, morals, theology, politics, civil and canon law, physics, metaphysics, astronomy, medicine, and chemistry.

ROGER BACON.

The powerful delusion of alchymy seized upon a mind still greater than that of Raymond Lulli. Roger Bacon firmly believed in the philosopher's stone, and spent much of his time in search of it. His example helped to render all the learned men of the time more convinced of its practicability, and more eager in the pursuit. He was born at Ilchester, in the county of Somerset, in the year 1214. He studied for some time in the University of Oxford, and afterwards in that of Paris, in which he received the degree of doctor of divinity. Returning to England in 1240, he became a monk of the order of St. Francis. He was by far the most learned man of his age; and his acquirements were so much above the comprehension of his contemporaries, that they could only account for them by supposing that he was indebted for them to the devil. Voltaire has not inaptly designated him "De l'or encrouté de toutes les ordures de son siècle;" but the crust of superstition that enveloped his powerful mind, though it may have dimmed, could not obscure the brightness of his genius. To him, and apparently to him only, among all the inquiring spirits of the time, were known the properties of the concave and convex lens. He also invented the magic lantern; that pretty plaything of modern days, which acquired for him a reputation that embittered his life. In a history of alchymy, the name of this great man cannot be omitted, although unlike many others of whom we shall have occasion to speak, he only made it secondary to other pursuits. The love of universal knowledge that filled his mind, would not allow him to neglect one branch of science, of which neither he nor the world could yet see the absurdity. He made ample amends for his time lost in this pursuit by his knowledge in physics and his acquaintance with astronomy. The telescope, burning-glasses, and gunpowder, are discoveries which may well carry his fame to the remotest time, and make the world blind to the one spot of folly—the diagnosis of the age in which he lived, and the circumstances by which he was surrounded. His treatise on the

Admirable Power of Art and Nature in the Production of the Philosopher's Stone was translated into French by Girard de Tormes, and published at Lyons in 1557. His *Mirror of Alchemy* was also published in French in the same year, and in Paris in 1612, with some additions from the works of Raymond Lulli. A complete list of all the published treatises upon the subject may be seen in Lenglet du Fresnoy.

POPE JOHN XXII.

This prelate is said to have been the friend and pupil of Arnold de Villeneuve, by whom he was instructed in all the secrets of alchemy. Tradition asserts of him, that he made great quantities of gold, and died as rich as Cræsus. He was born at Cahors, in the province of Guienne, in the year 1244. He was a very eloquent preacher, and soon reached high dignity in the Church. He wrote a work on the transmutation of metals, and had a famous laboratory at Avignon. He issued two bulls against the numerous pretenders to the art, who had sprung up in every part of Christendom; from which it might be inferred that he was himself free from the delusion. The alchemists claim him, however, as one of the most distinguished and successful professors of their art, and say that his bulls were not directed against the real adepts, but the false pretenders. They lay particular stress upon these words in his bull, "Spondent, quas non exhibent, divitias, *pauperes* alchymistæ." These, it is clear, they say, relate only to *poor* alchemists, and therefore false ones. He died in the year 1344, leaving in his coffers a sum of eighteen millions of florins. Popular belief alleged that he had made, and not amassed, this treasure; and alchemists complacently cite this as a proof that the philosopher's stone was not such a chimera as the incredulous pretended. They take it for granted that John really left this money, and ask by what possible means he could have accumulated it. Replying to their own question, they say triumphantly, "His book shews it was by alchemy, the secrets of which he learned from Arnold de Villeneuve

and Raymond Lulli. But he was as prudent as all other hermetic philosophers. Whoever would read his book to find out his secret, would employ all his labour in vain; the pope took good care not to divulge it." Unluckily for their own credit, all these gold-makers are in the same predicament; their great secret loses its worth most wonderfully in the telling, and therefore they keep it snugly to themselves. Perhaps they thought that, if everybody could transmute metals, gold would be so plentiful that it would be no longer valuable, and that some new art would be requisite to transmute it back again into steel and iron. If so, society is much indebted to them for their forbearance.

JEAN DE MEUNG.

All classes of men dabbled in the art at this time; the last mentioned was a pope, the one of whom we now speak was a poet. Jean de Meung, the celebrated author of the *Roman de la Rose*, was born in the year 1279 or 1280, and was a great personage at the courts of Louis X., Philip the Long, Charles IV., and Philip de Valois. His famous poem of the *Roman de la Rose*, which treats of every subject in vogue at that day, necessarily makes great mention of alchemy. Jean was a firm believer in the art, and wrote, besides his Roman, two shorter poems, the one entitled *The Remonstrance of Nature to the wandering Alchymist* and *The Reply of the Alchymist to Nature*. Poetry and alchemy were his delight, and priests and women were his abomination. A pleasant story is related of him and the ladies of the court of Charles IV. He had written the following libellous couplet upon the fair sex:

“Toutes êtes, serez, ou fûtes,
De fait ou de volonté, putains;
Et qui très bien vous chercherait,
Toutes putains vous trouverait.”³⁶

This naturally gave great offence; and being perceived one day in the king’s antechamber, by some ladies who were waiting for an audience, they resolved to punish him. To the number of ten or twelve, they armed themselves with canes and rods, and surrounding the unlucky poet, called upon the gentlemen present to strip him naked, that they might wreak just vengeance upon him, and lash him through the streets of the town. Some of the lords present were in no wise loath, and promised themselves great sport from his punishment. But Jean de Meung was unmoved by their threats, and stood up calmly in the midst of them, begging them to hear him first, and then, if not satisfied, they might do as they liked with him. Silence being restored, he stood upon a chair, and entered on his defence. He acknowledged that he was the author of the obnoxious verses, but denied that they bore reference to all womankind. He only meant to speak of the vicious and abandoned, whereas those whom he saw around him were patterns of virtue, loveliness, and modesty. If, however, any lady present thought herself aggrieved, he would consent to be stripped, and she might lash him till her arms

were wearied. It is added, that by this means Jean escaped his flogging, and that the wrath of the fair ones immediately subsided. The gentlemen present were, however, of opinion, that if every lady in the room whose character corresponded with the verses had taken him at his word; the poet would in all probability have been beaten to death. All his life long he evinced a great animosity towards the priesthood, and his famous poem abounds with passages reflecting upon their avarice, cruelty, and immorality. At his death he left a large box, filled with some weighty material, which he bequeathed to the Cordeliers, as a peace-offering, for the abuse he had lavished upon them. As his practice of alchemy was well known, it was thought the box was filled with gold and silver, and the Cordeliers congratulated each other on their rich acquisition. When it came to be opened, they found to their horror that it was filled only with *slates*, scratched with hieroglyphic and cabalistic characters. Indignant at the insult, they determined to refuse him Christian burial, on pretence that he was a sorcerer. He was, however, honourably buried in Paris, the whole court attending his funeral.

NICHOLAS FLAMEL.

The story of this alchemist, as handed down by tradition, and enshrined in the pages of Lenglet da Fresnoy, is not a little marvellous. He was born at Pontoise, of a poor but respectable family, at the end of the thirteenth, or beginning of the fourteenth century. Having no patrimony, he set out for Paris at an early age, to try his fortune as a public scribe. He had received a good education, was well skilled in the learned languages, and was an excellent penman. He soon procured occupation as a letter-writer and copyist,

and used to sit at the corner of the Rue de Marivaux, and practise his calling; but he hardly made profit enough to keep body and soul together. To mend his fortunes he tried poetry; but this was a more wretched occupation still. As a transcriber he had at least gained bread and cheese; but his rhymes were not worth a crust. He then tried painting with as little success; and as a last resource, began to search for the philosopher's stone and tell fortunes. This was a happier idea; he soon increased in substance, and had wherewithal to live comfortably. He therefore took unto himself his wife Petronella, and began to save money; but continued to all outward appearance as poor and miserable as before. In the course of a few years, he became desperately addicted to the study of alchymy, and thought of nothing but the philosopher's stone, the elixir of life, and the universal alkahest. In the year 1257, he bought by chance an old book for two florins, which soon became his sole study. It was written with a steel instrument upon the bark of trees, and contained twenty-one, or as he himself always expressed it, three times seven, leaves. The writing was very elegant and in the Latin language. Each seventh leaf contained a picture and no writing. On the first of these was a serpent swallowing rods; on the second, a cross with a serpent crucified; and on the third, the representation of a desert, in the midst of which was a fountain, with serpents crawling from side to side. It purported to be written by no less a personage than "Abraham, patriarch, Jew, prince, philosopher, priest, Levite, and astrologer;" and invoked curses upon any one who should cast eyes upon it, without being "a sacrificer or a scribe." Nicholas Flamel never thought it extraordinary that Abraham should have known Latin, and was convinced that the characters on his book had been

traced by the hands of that great patriarch himself. He was at first afraid to read it, after he became aware of the curse it contained; but he got over that difficulty by recollecting that, although he was not a sacrificer, he had practised as a scribe. As he read he was filled with admiration, and found that it was a perfect treatise upon the transmutation of metals. All the processes were clearly explained; the vessels, the retorts, the mixtures, and the proper times and seasons for experiment. But as ill-luck would have it, the possession of the philosopher's stone, or prime agent in the work, was presupposed. This was a difficulty which was not to be got over. It was like telling a starving man how to cook a beef-steak, instead of giving him the money to buy one. But Nicholas did not despair, and set about studying the hieroglyphics and allegorical representations with which the book abounded. He soon convinced himself that it had been one of the sacred books of the Jews, and that it was taken from the temple of Jerusalem on its destruction by Titus. The process of reasoning by which he arrived at this conclusion is not stated.

From some expression in the treatise, he learned that the allegorical drawings on the fourth and fifth leaves enshrined the secret of the philosopher's stone, without which all the fine Latin of the directions was utterly unavailing. He invited all the alchemists and learned men of Paris to come and examine them, but they all departed as wise as they came. Nobody could make any thing either of Nicholas or his pictures; and some even went so far as to say that his invaluable book was not worth a farthing. This was not to be borne; and Nicholas resolved to discover the great secret by himself, without troubling the philosophers. He found on the first page of the fourth leaf, the picture of Mercury attacked by an old man

resembling Saturn or Time. The latter had an hour-glass on his head, and in his hand a scythe, with which he aimed a blow at Mercury's feet. The reverse of the leaf represented a flower growing on a mountain top, shaken rudely by the wind, with a blue stalk, red and white blossoms, and leaves of pure gold. Around it were a great number of dragons and griffins. On the first page of the fifth leaf was a fine garden, in the midst of which was a rose-tree in full bloom, supported against the trunk of a gigantic oak. At the foot of this there bubbled up a fountain of milk-white water, which, forming a small stream, flowed through the garden, and was afterwards lost in the sands. On the second page was a king, with a sword in his hand, superintending a number of soldiers, who, in execution of his orders, were killing a great multitude of young children, spurning the prayers and tears of their mothers, who tried to save them from destruction. The blood of the children was carefully collected by another party of soldiers, and put into a large vessel, in which two allegorical figures of the sun and moon were bathing themselves.

For twenty-one years poor Nicholas wearied himself with the study of these pictures, but still he could make nothing of them. His wife Petronella at last persuaded him to find out some learned rabbi; but there was no rabbi in Paris learned enough to be of any service to him. The Jews met but small encouragement to fix their abode in France, and all the chiefs of that people were located in Spain. To Spain accordingly Nicholas Flamel repaired. He left his book in Paris, for fear, perhaps, that he might be robbed of it on the road; and telling his neighbours that he was going on a pilgrimage to the shrine of St. James of Compostello, he trudged on foot towards Madrid in search of a rabbi. He was absent two years in that country,

and made himself known to a great number of Jews, descendants of those who had been expelled from France in the reign of Philip Augustus. The believers in the philosopher's stone give the following account of his adventures: They say that at Leon he made the acquaintance of a converted Jew, named Cauches, a very learned physician, to whom he explained the title and nature of his little book. The doctor was transported with joy as soon as he heard it named, and immediately resolved to accompany Nicholas to Paris, that he might have a sight of it. The two set out together; the doctor on the way entertaining his companion with the history of his book, which, if the genuine book he thought it to be, from the description he had heard of it, was in the handwriting of Abraham himself, and had been in the possession of personages no less distinguished than Moses, Joshua, Solomon, and Esdras. It contained all the secrets of alchymy and of many other sciences, and was the most valuable book that had ever existed in this world. The doctor was himself no mean adept, and Nicholas profited greatly by his discourse, as in the garb of poor pilgrims they wended their way to Paris, convinced of their power to turn every old shovel in that capital into pure gold. But, unfortunately, when they reached Orleans, the doctor was taken dangerously ill. Nicholas watched by his bedside, and acted the double part of a physician and nurse to him; but he died after a few days, lamenting with his last breath that he had not lived long enough to see the precious volume. Nicholas rendered the last honours to his body; and with a sorrowful heart, and not one *sou* in his pocket, proceeded home to his wife Petronella. He immediately recommenced the study of his pictures; but for two whole years he was as far from understanding them as ever. At last, in the third year,

a glimmer of light stole over his understanding. He recalled some expression of his friend the doctor, which had hitherto escaped his memory, and he found that all his previous experiments had been conducted on a wrong basis. He recommenced them now with renewed energy, and at the end of the year had the satisfaction to see all his toils rewarded. On the 13th January 1382, says Lenglet, he made a projection on mercury, and had some very excellent silver. On the 25th April following, he converted a large quantity of mercury into gold, and the great secret was his.

Nicholas was now about eighty years of age, and still a hale and stout old man. His friends say that by a simultaneous discovery of the elixir of life, he found means to keep death at a distance for another quarter of a century; and that he died in 1415, at the age of 116. In this interval he made immense quantities of gold, though to all outward appearance he was as poor as a mouse. At an early period of his changed fortune, he had, like a worthy man, taken counsel with his old wife Petronella, as to the best use he could make of his wealth. Petronella replied, that as unfortunately they had no children, the best thing he could do, was to build hospitals and endow churches. Nicholas thought so too, especially when he began to find that his elixir could not keep off death, and that the grim foe was making rapid advances upon him. He richly endowed the church of St. Jacques de la Boucherie, near the Rue de Marivaux, where he had all his life resided, besides seven others in different parts of the kingdom. He also endowed fourteen hospitals, and built three chapels.

The fame of his great wealth and his munificent benefactions soon spread over all the country, and he was visited, among others, by the

celebrated doctors of that day, Jean Gerson, Jean de Courtecuisse, and Pierre d'Ailli. They found him in his humble apartment, meanly clad, and eating porridge out of an earthen vessel; and with regard to his secret, as impenetrable as all his predecessors in alchemy. His fame reached the ears of the king, Charles VI., who sent M. de Cramoisi, the Master of Requests, to find out whether Nicholas had indeed discovered the philosopher's stone. But M. de Cramoisi took nothing by his visit; all his attempts to sound the alchemist were unavailing, and he returned to his royal master no wiser than he came. It was in this year, 1414, that he lost his faithful Petronella. He did not long survive her, but died in the following year, and was buried with great pomp by the grateful priests of St. Jacques de la Boucherie.

The great wealth of Nicholas Flamel is undoubted, as the records of several churches and hospitals in France can testify. That he practised alchemy is equally certain, as he left behind several works upon the subject. Those who knew him well, and who were incredulous about the philosopher's stone, give a satisfactory solution of the secret of his wealth. They say that he was always a miser and a usurer; that his journey to Spain was undertaken with very different motives from those pretended by the alchemists; that, in fact, he went to collect debts due from Jews in that country to their brethren in Paris, and that he charged a commission of fully cent per cent in consideration of the difficulty of collecting and the dangers of the road; that when he possessed thousands, he lived upon almost nothing; and was the general money-lender, at enormous profits, to all the dissipated young men at the French court.

Among the works written by Nicholas Flamel on the subject of alchemy is *The Philosophic Summary*, a poem, reprinted in 1735, as an appendix to the third volume of the *Roman de la Rose*. He also wrote three treatises upon natural philosophy, and an alchymic allegory, entitled *Le Désir désiré*. Specimens of his writing, and a facsimile of the drawings in his book of Abraham, may be seen in Salmon's *Bibliothèque des Philosophes Chimiques*. The writer of the article *Flamel* in the *Biographie Universelle* says, that for a hundred years after the death of Flamel, many of the adepts believed that he was still alive, and that he would live for upwards of six hundred years. The house he formerly occupied, at the corner of the Rue de Marivaux, has been often taken by credulous speculators, and ransacked from top to bottom, in the hopes that gold might be found. A report was current in Paris, not long previous to the year 1816, that some lodgers had found in the cellars several jars filled with a dark-coloured ponderous matter. Upon the strength of the rumour, a believer in all the wondrous tales told of Nicholas Flamel bought the house, and nearly pulled it to pieces in ransacking the walls and wainscoting for hidden gold. He got nothing for his pains, however, and had a heavy bill to pay to restore his dilapidations.

GEORGE RIPLEY.

While alchymy was thus cultivated on the continent of Europe, it was not neglected in the isles of Britain. Since the time of Roger Bacon, it had fascinated the imagination of many ardent men in England. In the year 1404 an act of parliament was passed declaring the making of gold and silver to be felony. Great alarm was felt at that time lest any alchymist should succeed in his projects, and

perhaps bring ruin upon the state by furnishing boundless wealth to some designing tyrant, who would make use of it to enslave his country. This alarm appears to have soon subsided; for, in the year 1455, King Henry VI., by advice of his council and parliament, granted four successive patents and commissions to several knights, citizens of London, chemists, monks, mass-priests, and others, to find out the philosopher's stone and elixir, "to the great benefit," said the patent, "of the realm, and the enabling of the king to pay all the debts of the crown in real gold and silver." Prinn, in his *Aurum Reginae*, observes, as a note to this passage, that the king's reason for granting this patent to ecclesiastics was, that "they were such good artists in transubstantiating bread and wine in the eucharist, and therefore the more likely to be able to effect the transmutation of baser metals into better." No gold, of course, was ever made; and next year the king, doubting very much of the practicability of the thing, took further advice, and appointed a commission of ten learned men and persons of eminence to judge and certify to him whether the transmutation of metals were a thing practicable or no. It does not appear whether the commission ever made any report upon the subject.

In the succeeding reign an alchemist appeared who pretended to have discovered the secret. This was George Ripley, the canon of Bridlington, in Yorkshire. He studied for twenty years in the universities of Italy, and was a great favourite with Pope Innocent VIII., who made him one of his domestic chaplains, and master of the ceremonies in his household. Returning to England in 1477, he dedicated to King Edward IV. his famous work, *The Compound of Alchymy; or, the Twelve Gates leading to the Discovery of the*

Philosopher's Stone. These gates he described to be calcination, solution, separation, conjunction, putrefaction, congelation, cibation, sublimation, fermentation, exaltation, multiplication, and projection; to which he might have added botheration, the most important process of all. He was very rich, and allowed it to be believed that he could make gold out of iron. Fuller, in his *Worthies of England*, says that an English gentleman of good credit reported, that in his travels abroad he saw a record in the island of Malta which declared that Ripley gave yearly to the knights of that island, and of Rhodes, the enormous sum of one hundred thousand pounds sterling to enable them to carry on the war against the Turks. In his old age he became an anchorite near Boston, and wrote twenty-five volumes upon the subject of alchymy, the most important of which is the *Duodecim Portarum* already mentioned. Before he died, he seems to have acknowledged that he had mis-spent his life in this vain study, and requested that all men, when they met with any of his books, would burn them, or afford them no credit, as they had been written merely from his opinion, and not from proof; and that subsequent trial had made manifest to him that they were false and vain.³⁷

BASIL VALENTINE.

Germany also produced many famous alchymists in the fifteenth century, the chief of whom are Basil Valentine, Bernard of Trèves, and the Abbot Trithemius. Basil Valentine was born at Mayence, and was made prior of St. Peter's, at Erfurt, about the year 1414. It was known, during his life, that he diligently sought the philosopher's stone, and that he had written some works upon the process of transmutation. They were thought for many years to be lost, but

were, after his death, discovered enclosed in the stone-work of one of the pillars in the Abbey. They were twenty-one in number, and are fully set forth in the third volume of Lenglet's *History of the Hermetic Philosophy*. The alchemists asserted that heaven itself conspired to bring to light these extraordinary works; and that the pillar in which they were enclosed was miraculously shattered by a thunderbolt; and that as soon as the manuscripts were liberated, the pillar closed up again of its own accord!

BERNARD OF TREVES.

The life of this philosopher is a remarkable instance of talent and perseverance misapplied. In the search of his chimera nothing could daunt him. Repeated disappointment never diminished his hopes; and from the age of fourteen to that of eighty-five he was incessantly employed among the drugs and furnaces of his laboratory, wasting his life with the view of prolonging it, and reducing himself to beggary in the hopes of growing rich.

He was born at either Trèves or Padua in the year 1406. His father is said by some to have been a physician in the latter city, and by others to have been Count of the Marches of Trèves, and one of the most wealthy nobles of his country. At all events, whether noble or physician, he was a rich man, and left his son a magnificent estate. At the age of fourteen he first became enamoured of the science of alchemy, and read the Arabian authors in their own language. He himself has left a most interesting record of his labours and wanderings, from which the following particulars are chiefly extracted. The first book which fell into his hands was that of the Arabian philosopher Rhazes, from the reading of which he imagined

that he had discovered the means of augmenting gold a hundredfold. For four years he worked in his laboratory, with the book of Rhazes continually before him. At the end of that time, he found that he had spent no less than eight hundred crowns upon his experiment, and had got nothing but fire and smoke for his pains. He now began to lose confidence in Rhazes, and turned to the works of Geber. He studied him assiduously for two years; and being young, rich, and credulous, was beset by all the alchemists of the town, who kindly assisted him in spending his money. He did not lose his faith in Geber, or patience with his hungry assistants, until he had lost two thousand crowns—a very considerable sum in those days.

Among all the crowd of pretended men of science who surrounded him, there was but one as enthusiastic and as disinterested as himself. With this man, who was a monk of the order of St. Francis, he contracted an intimate friendship, and spent nearly all his time. Some obscure treatises of Rupecissa and Sacrobosco having fallen into their hands, they were persuaded, from reading them, that highly rectified spirits of wine was the universal alkahest, or dissolvent, which would aid them greatly in the process of transmutation. They rectified the alcohol thirty times, till they made it so strong as to burst the vessels which contained it. After they had worked three years, and spent three hundred crowns in the liquor, they discovered that they were on the wrong track. They next tried alum and copperas; but the great secret still escaped them. They afterwards imagined that there was a marvellous virtue in all excrement, especially the human, and actually employed more than two years in experimentalising upon it with mercury, salt, and molten lead! Again the adepts flocked around him from far and near

to aid him with their counsels. He received them all hospitably, and divided his wealth among them so generously and unhesitatingly, that they gave him the name of the "Good Trevisan," by which he is still often mentioned in works that treat on alchymy. For twelve years he led this life, making experiments every day upon some new substance, and praying to God night and morning that he might discover the secret of transmutation.

In this interval he lost his friend the monk, and was joined by a magistrate of the city of Trèves, as ardent as himself in the search. His new acquaintance imagined that the ocean was the mother of gold, and that sea-salt would change lead or iron into the precious metals. Bernard resolved to try; and, transporting his laboratory to a house on the shores of the Baltic, he worked upon salt for more than a year, melting it, sublimating it, crystallising it, and occasionally drinking it, for the sake of other experiments. Still the strange enthusiast was not wholly discouraged, and his failure in one trial only made him the more anxious to attempt another.

He was now approaching the age of fifty, and had as yet seen nothing of the world. He therefore determined to travel through Germany, Italy, France, and Spain. Wherever he stopped he made inquiries whether there were any alchymists in the neighbourhood. He invariably sought them out; and if they were poor, relieved, and if affluent, encouraged them. At Citeaux he became acquainted with one Geoffrey Leuvier, a monk of that place, who persuaded him that the essence of egg-shells was a valuable ingredient. He tried, therefore, what could be done; and was only prevented from wasting a year or two on the experiment by the opinions of an attorney, at Berghem, in Flanders, who said that the great secret resided in

vinegar and copperas. He was not convinced of the absurdity of this idea until he had nearly poisoned himself. He resided in France for about five years, when, hearing accidentally that one Master Henry, confessor to the Emperor Frederic III., had discovered the philosopher's stone, he set out for Germany to pay him a visit. He had, as usual, surrounded himself with a set of hungry dependants, several of whom determined to accompany him. He had not heart to refuse them, and he arrived at Vienna with five of them. Bernard sent a polite invitation to the confessor, and gave him a sumptuous entertainment, at which were present nearly all the alchemists of Vienna. Master Henry frankly confessed that he had not discovered the philosopher's stone, but that he had all his life been employed in searching for it, and would so continue till he found it, or died. This was a man after Bernard's own heart, and they vowed with each other an eternal friendship. It was resolved, at supper, that each alchemist present should contribute a certain sum towards raising forty-two marks of gold, which, in five days, it was confidently asserted by Master Henry, would increase, in his furnace, fivefold. Bernard, being the richest man, contributed the lion's share, ten marks of gold, Master Henry five, and the others one or two a-piece, except the dependants of Bernard, who were obliged to borrow their quota from their patron. The grand experiment was duly made; the golden marks were put into a crucible, with a quantity of salt, copperas, aquafortis, egg-shells, mercury, lead, and dung. The alchemists watched this precious mess with intense interest, expecting that it would agglomerate into one lump of pure gold. At the end of three weeks they gave up the trial, upon some excuse that the crucible was not strong enough, or that some necessary

ingredient was wanting. Whether any thief had put his hands into the crucible is not known, but it is alleged that the gold found therein at the close of the experiment was worth only sixteen marks, instead of the forty-two, which were put there at the beginning.

Bernard, though he made no gold at Vienna, made away with a very considerable quantity. He felt the loss so acutely, that he vowed to think no more of the philosopher's stone. This wise resolution he kept for two months; but he was miserable. He was in the condition of the gambler, who cannot resist the fascination of the game while he has a coin remaining, but plays on with the hope of retrieving former losses, till hope forsakes him, and he can live no longer. He returned once more to his beloved crucibles, and resolved to prosecute his journey in search of a philosopher who had discovered the secret, and would communicate it to so zealous and persevering an adept as himself. From Vienna he travelled to Rome, and from Rome to Madrid. Taking ship at Gibraltar, he proceeded to Messina; from Messina to Cyprus; from Cyprus to Greece; from Greece to Constantinople; and thence into Egypt, Palestine, and Persia. These wanderings occupied him about eight years. From Persia he made his way back to Messina, and from thence into France. He afterwards passed over into England, still in search of his great chimera; and this occupied four years more of his life. He was now growing both old and poor; for he was sixty-two years of age, and had been obliged to sell a great portion of his patrimony to provide for his expenses. His journey to Persia had cost upwards of thirteen thousand crowns, about one-half of which had been fairly melted in his all-devouring furnaces; the other half was lavished upon the sycophants that he made it his business to search out in every town he stopped at.

On his return to Trèves he found, to his sorrow, that, if not an actual beggar, he was not much better. His relatives looked upon him as a madman, and refused even to see him. Too proud to ask for favours from any one, and still confident that, some day or other, he would be the possessor of unbounded wealth, he made up his mind to retire to the island of Rhodes, where he might, in the mean time, hide his poverty from the eyes of the world. Here he might have lived unknown and happy; but, as ill luck would have it, he fell in with a monk as mad as himself upon the subject of transmutation. They were, however, both so poor that they could not afford to buy the proper materials to work with. They kept up each other's spirits by learned discourses on the hermetic philosophy, and in the reading of all the great authors who had written upon the subject. Thus did they nurse their folly, as the good wife of Tam O'Shanter did her wrath, "to keep it warm." After Bernard had resided about a year in Rhodes, a merchant, who knew his family, advanced him the sum of eight thousand florins, upon the security of the last-remaining acres of his formerly large estate. Once more provided with funds, he recommenced his labours with all the zeal and enthusiasm of a young man. For three years he hardly stepped out of his laboratory: he ate there, and slept there, and did not even give himself time to wash his hands and clean his beard, so intense was his application. It is melancholy to think that such wonderful perseverance should have been wasted in so vain a pursuit, and that energies so unconquerable should have had no worthier field to strive in. Even when he had fumed away his last coin, and had nothing left in prospective to keep his old age from starvation, hope never forsook him. He still dreamed of ultimate success, and sat down a grey-headed man of

eighty, to read over all the authors on the hermetic mysteries, from Geber to his own day, lest he should have misunderstood some process, which it was not yet too late to recommence. The alchymists say, that he succeeded at last, and discovered the secret of transmutation in his eighty-second year. They add that he lived three years afterwards to enjoy his wealth. He lived, it is true, to this great age, and made a valuable discovery—more valuable than gold or gems. He learned, as he himself informs us, just before he had attained his eighty-third year, that the great secret of philosophy was contentment with our lot. Happy would it have been for him if he had discovered it sooner, and before he became decrepit, a beggar, and an exile!

He died at Rhodes, in the year 1490, and all the alchymists of Europe sang elegies over him, and sounded his praise as the “good Trevisan.” He wrote several treatises upon his chimera, the chief of which are, the *Book of Chemistry*, the *Verbum dimissum*, and an essay *De Natura Ovi*.

TRITHEMIUS.

The name of this eminent man has become famous in the annals of alchymy, although he did but little to gain so questionable an honour. He was born in the year 1462, at the village of Trittheim, in the electorate of Trèves. His father was John Heidenberg, a vine-grower, in easy circumstances, who, dying when his son was but seven years old, left him to the care of his mother. The latter married again very shortly afterwards, and neglected the poor boy, the offspring of her first marriage. At the age of fifteen he did not even know his letters, and was, besides, half starved, and otherwise ill-

treated by his step-father; but the love of knowledge germinated in the breast of the unfortunate youth, and he learned to read at the house of a neighbour. His father-in-law set him to work in the vineyards, and thus occupied all his days; but the nights were his own. He often stole out unheeded, when all the household were fast asleep, poring over his studies in the fields, by the light of the moon; and thus taught himself Latin and the rudiments of Greek. He was subjected to so much ill-usage at home, in consequence of this love of study, that he determined to leave it. Demanding the patrimony which his father had left him, he proceeded to Trèves; and assuming the name of Trithemius, from that of his native village of Tritheim, lived there for some months under the tuition of eminent masters, by whom he was prepared for the university. At the age of twenty, he took it into his head that he should like to see his mother once more; and he set out on foot from the distant university for that purpose. On his arrival near Spannheim, late in the evening of a gloomy winter's day, it came on to snow so thickly, that he could not proceed onwards to the town. He therefore took refuge for the night in a neighbouring monastery; but the storm continued several days, the roads became impassable, and the hospitable monks would not hear of his departure. He was so pleased with them and their manner of life, that he suddenly resolved to fix his abode among them, and renounce the world. They were no less pleased with him, and gladly received him as a brother. In the course of two years, although still so young, he was unanimously elected their abbot. The financial affairs of the establishment had been greatly neglected, the walls of the building were falling into ruin, and every thing was in disorder. Trithemius, by his good management and regularity, introduced a

reform in every branch of expenditure. The monastery was repaired, and a yearly surplus, instead of a deficiency, rewarded him for his pains. He did not like to see the monks idle, or occupied solely between prayers for their business, and chess for their relaxation. He, therefore, set them to work to copy the writings of eminent authors. They laboured so assiduously, that, in the course of a few years, their library, which had contained only about forty volumes, was enriched with several hundred valuable manuscripts, comprising many of the classical Latin authors, besides the works of the early fathers, and the principal historians, and philosophers of more modern date. He retained the dignity of Abbot of Spannheim for twenty-one years, when the monks, tired of the severe discipline he maintained, revolted against him, and chose another abbot in his place. He was afterwards made Abbot of St. James, in Wurzburg, where he died in 1516.

During his learned leisure at Spannheim, he wrote several works upon the occult sciences, the chief of which are an essay on geomancy, or divination by means of lines and circles on the ground; another upon sorcery; a third upon alchymy; and a fourth upon the government of the world by its presiding angels, which was translated into English, and published by the famous William Lilly in 1647.

It has been alleged by the believers in the possibility of transmutation, that the prosperity of the abbey of Spannheim, while under his superintendence, was owing more to the philosopher's stone than to wise economy. Trithemius, in common with many other learned men, has been accused of magic; and a marvellous story is told of his having raised from the grave the form of Mary of

Burgundy, at the intercession of her widowed husband, the Emperor Maximilian. His work on steganographia, or cabalistic writing, was denounced to the Count Palatine, Frederic II., as magical and devilish; and it was by him taken from the shelves of his library and thrown into the fire. Trithemius is said to be the first writer who makes mention of the wonderful story of the devil and Dr. Faustus, the truth of which he firmly believed. He also recounts the freaks of a spirit named *Hudekin*, by whom he was at times tormented.³⁸

THE MARECHAL DE RAYS.

One of the greatest encouragers of alchymy in the fifteenth century was Gilles de Laval, Lord of Rays and a Marshal of France. His name and deeds are little known; but in the annals of crime and folly, they might claim the highest and worst pre-eminence. Fiction has never invented any thing wilder or more horrible than his career; and were not the details but too well authenticated by legal and other documents which admit no doubt, the lover of romance might easily imagine they were drawn to please him from the stores of the prolific brain, and not from the page of history.

He was born about the year 1420, of one of the noblest families of Brittany. His father dying when Gilles had attained his twentieth year, he came into uncontrolled possession, at that early age, of a fortune which the monarchs of France might have envied him. He was a near kinsman of the Montmorencys, the Roncys, and the Craons; possessed fifteen princely domains, and had an annual revenue of about three hundred thousand livres. Besides this, he was handsome, learned, and brave. He distinguished himself greatly in the wars of Charles VII., and was rewarded by that monarch with the

dignity of a marshal of France. But he was extravagant and magnificent in his style of living, and accustomed from his earliest years to the gratification of every wish and passion; and this, at last, led him from vice to vice and from crime to crime, till a blacker name than his is not to be found in any record of human iniquity.

In his castle of Champtocé he lived with all the splendour of an eastern caliph. He kept up a troop of two hundred horsemen to accompany him wherever he went; and his excursions for the purposes of hawking and hunting were the wonder of all the country around, so magnificent were the caparisons of his steeds and the dresses of his retainers. Day and night his castle was open all the year round to comers of every degree. He made it a rule to regale even the poorest beggar with wine and hippocrass. Every day an ox was roasted whole in his spacious kitchens, besides sheep, pigs, and poultry sufficient to feed five hundred persons. He was equally magnificent in his devotions. His private chapel at Champtocé was the most beautiful in France, and far surpassed any of those in the richly-endowed cathedrals of Notre Dame in Paris, of Amiens, of Beauvais, or of Rouen. It was hung with cloth of gold and rich velvet. All the chandeliers were of pure gold curiously inlaid with silver. The great crucifix over the altar was of solid silver, and the chalices and incense-burners were of pure gold. He had besides a fine organ, which he caused to be carried from one castle to another on the shoulders of six men, whenever he changed his residence. He kept up a choir of twenty-five young children of both sexes, who were instructed in singing by the first musicians of the day. The master of his chapel he called a bishop, who had under him his deans, arch-

deacons, and vicars, each receiving great salaries; the bishop four hundred crowns a year, and the rest in proportion.

He also maintained a whole troop of players, including ten dancing girls and as many ballad-singers, besides morris-dancers, jugglers, and mountebanks of every description. The theatre on which they performed was fitted up without any regard to expense, and they played mysteries or danced the morris-dance every evening for the amusement of himself and household, and such strangers as were sharing his prodigal hospitality.

At the age of twenty-three he married Catherine, the wealthy heiress of the house of Touars, for whom he refurnished his castle at an expense of a hundred thousand crowns. His marriage was the signal for new extravagance, and he launched out more madly than ever he had done before; sending for fine singers or celebrated dancers from foreign countries to amuse him and his spouse; and instituting tilts and tournaments in his great court-yard almost every week for all the knights and nobles of the province of Brittany. The Duke of Brittany's court was not half so splendid as that of the Maréchal de Rays. His utter disregard for wealth was so well known, that he was made to pay three times its value for every thing he purchased. His castle was filled with needy parasites and panderers to his pleasures, amongst whom he lavished rewards with an unsparing hand. But the ordinary round of sensual gratification ceased at last to afford him delight; he was observed to be more abstemious in the pleasures of the table, and to neglect the beautiful dancing girls who used formerly to occupy so much of his attention. He was sometimes gloomy and reserved, and there was an unnatural wildness in his eye which gave indications of incipient madness. Still

his discourse was as reasonable as ever, his urbanity to the guests that flocked from far and near to Champtocé suffered no diminution; and learned priests, when they conversed with him, thought to themselves that few of the nobles of France were so well informed as Gilles de Laval. But dark rumours spread gradually over the country; murder, and, if possible, still more atrocious deeds were hinted at; and it was remarked that many young children of both sexes suddenly disappeared, and were never afterwards heard of. One or two had been traced to the castle of Champtocé, and had never been seen to leave it; but no one dared to accuse openly so powerful a man as the Maréchal de Rays. Whenever the subject of the lost children was mentioned in his presence, he manifested the greatest astonishment at the mystery which involved their fate, and indignation against those who might be guilty of kidnapping them. Still the world was not wholly deceived; his name became as formidable to young children as that of the devouring ogre in fairy tales, and they were taught to go miles round, rather than pass under the turrets of Champtocé.

In the course of a few years, the reckless extravagance of the marshal drained him of all his funds, and he was obliged to put up some of his estates for sale. The Duke of Brittany entered into a treaty with him for the valuable seignory of Ingrande; but the heirs of Gilles implored the interference of Charles VII. to stay the sale. Charles immediately issued an edict, which was confirmed by the provincial Parliament of Brittany, forbidding him to alienate his paternal estates. Gilles had no alternative but to submit. He had nothing to support his extravagance but his allowance as a marshal of France, which did not cover the one-tenth of his expenses. A man

of his habits and character could not retrench his wasteful expenditure, and live reasonably; he could not dismiss without a pang his horsemen, his jesters, his morris-dancers, his choristers, and his parasites, or confine his hospitality to those who really needed it. Notwithstanding his diminished resources, he resolved to live as he had lived before, and turn alchemist, that he might make gold out of iron, and be still the wealthiest and most magnificent among the nobles of Brittany.

In pursuance of this determination, he sent to Paris, Italy, Germany, and Spain, inviting all the adepts in the science to visit him at Champtocé. The messengers he despatched on this mission were two of his most needy and unprincipled dependants, Gilles de Sillé and Roger de Bricqueville. The latter, the obsequious panderer to his most secret and abominable pleasures, he had entrusted with the education of his motherless daughter, a child but five years of age, with permission that he might marry her at the proper time to any person he chose, or to himself if he liked it better. This man entered into the new plans of his master with great zeal, and introduced to him one Prelati, an alchemist of Padua, and a physician of Poitou, who was addicted to the same pursuits.

The marshal caused a splendid laboratory to be fitted up for them, and the three commenced the search for the philosopher's stone. They were soon afterwards joined by another pretended philosopher, named Anthony Palermo, who aided in their operations for upwards of a year. They all fared sumptuously at the marshal's expense, draining him of the ready money he possessed, and leading him on from day to day with the hope that they would succeed in the object of their search. From time to time new aspirants from the remotest

parts of Europe arrived at his castle, and for months he had upwards of twenty alchemists at work, trying to transmute copper into gold; and wasting the gold which was still his own in drugs and elixirs.

But the Lord of Rays was not a man to abide patiently their lingering processes. Pleased with their comfortable quarters, they jogged on from day to day, and would have done so for years, had they been permitted. But he suddenly dismissed them all, with the exception of the Italian Prelati, and the physician of Poitou. These he retained to aid him to discover the secret of the philosopher's stone by a bolder method. The Poitousan had persuaded him that the devil was the great depository of that and all other secrets, and that he would raise him before Gilles, who might enter into any contract he pleased with him. Gilles expressed his readiness, and promised to give the devil any thing but his soul, or do any deed that the arch-enemy might impose upon him. Attended solely by the physician, he proceeded at midnight to a wild-looking place in a neighbouring forest; the physician drew a magic circle around them on the sward, and muttered for half an hour an invocation to the evil spirit to arise at his bidding, and disclose the secrets of alchemy. Gilles looked on with intense interest, and expected every moment to see the earth open, and deliver to his gaze the great enemy of mankind. At last the eyes of the physician became fixed, his hair stood on end, and he spoke, as if addressing the fiend. But Gilles saw nothing except his companion. At last the physician fell down on the sward as if insensible. Gilles looked calmly on to see the end. After a few minutes the physician arose, and asked him if he had not seen how angry the devil looked? Gilles replied that he had seen nothing; upon which his companion informed him that Beelzebub had appeared in

the form of a wild leopard, growled at him savagely, and said nothing; and that the reason why the marshal had neither seen nor heard him was, that he hesitated in his own mind as to devoting himself entirely to the service. De Rays owned that he had indeed misgivings, and inquired what was to be done to make the devil speak out, and unfold his secret? The physician replied, that some person must go to Spain and Africa to collect certain herbs which only grew in those countries, and offered to go himself, if De Rays would provide the necessary funds. De Rays at once consented; and the physician set out on the following day with all the gold that his dupe could spare him. The marshal never saw his face again.

But the eager Lord of Champtocé could not rest. Gold was necessary for his pleasures; and unless by supernatural aid, he had no means of procuring any further supplies. The physician was hardly twenty leagues on his journey, before Gilles resolved to make another effort to force the devil to divulge the art of gold-making. He went out alone for that purpose; but all his conjurations were of no effect. Beelzebub was obstinate, and would not appear. Determined to conquer him if he could, he unbosomed himself to the Italian alchemist, Prelati. The latter offered to undertake the business, upon condition that De Rays did not interfere in the conjurations, and consented besides to furnish him with all the charms and talismans that might be required. He was further to open a vein in his arm, and sign with his blood a contract that "he would work the devil's will in all things," and offer up to him a sacrifice of the heart, lungs, hands, eyes, and blood of a young child. The grasping monomaniac made no hesitation, but agreed at once to the disgusting terms proposed to him. On the following night, Prelati went out alone, and after having

been absent for three or four hours, returned to Gilles, who sat anxiously awaiting him. Prelati then informed him that he had seen the devil in the shape of a handsome youth of twenty. He further said, that the devil desired to be called *Barron* in all future invocations; and had shewn him a great number of ingots of pure gold, buried under a large oak in the neighbouring forest, all of which, and as many more as he desired, should become the property of the Maréchal de Rays if he remained firm, and broke no condition of the contract. Prelati further shewed him a small casket of black dust, which would turn iron into gold; but as the process was very troublesome, he advised that they should be contented with the ingots they found under the oak tree, and which would more than supply all the wants that the most extravagant imagination could desire. They were not, however, to attempt to look for the gold till a period of seven times seven weeks, or they would find nothing but slates and stones for their pains. Gilles expressed the utmost chagrin and disappointment, and at once said that he could not wait for so long a period; if the devil were not more, prompt Prelati might tell him that the Maréchal de Rays was not to be trifled with, and would decline all further communication with him. Prelati at last persuaded him to wait seven times seven days. They then went at midnight with picks and shovels to dig up the ground under the oak, where they found nothing to reward them but a great quantity of slates, marked with hieroglyphics. It was now Prelati's turn to be angry; and he loudly swore that the devil was nothing but a liar and a cheat. The marshal joined cordially in the opinion, but was easily persuaded by the cunning Italian to make one more trial. He promised at the same time that he would endeavour on the following night to discover the

reason why the devil had broken his word. He went out alone accordingly, and on his return informed his patron that he had seen Barron, who was exceedingly angry that they had not waited the proper time ere they looked for the ingots. Barron had also said, that the Maréchal de Rays could hardly expect any favours from him, at a time when he must know that he had been meditating a pilgrimage to the Holy Land to make atonement for his sins. The Italian had doubtless surmised this from some incautious expression of his patron, for de Rays frankly confessed that there were times when, sick of the world and all its pomps and vanities, he thought of devoting himself to the service of God.

In this manner the Italian lured on from month to month his credulous and guilty patron, extracting from him all the valuables he possessed, and only waiting a favourable opportunity to decamp with his plunder. But the day of retribution was at hand for both. Young girls and boys continued to disappear in the most mysterious manner; and the rumours against the owner of Champtocé grew so loud and distinct, that the Church was compelled to interfere. Representations were made by the Bishop of Nantes to the Duke of Brittany, that it would be a public scandal if the accusations against the Maréchal de Rays were not inquired into. He was arrested accordingly in his own castle, along with his accomplice Prelati, and thrown into a dungeon at Nantes to await his trial.

The judges appointed to try him were the Bishop of Nantes Chancellor of Brittany, the Vicar of the Inquisition in France, and the celebrated Pierre l'Hôpital, the President of the provincial Parliament. The offences laid to his charge were, sorcery, sodomy, and murder. Gilles, on the first day of his trial, conducted himself

with the utmost insolence. He braved the judges on the judgment-seat, calling them simoniacs and persons of impure life, and said he would rather be hanged by the neck like a dog without trial, than plead either guilty or not guilty before such contemptible miscreants. But his confidence forsook him as the trial proceeded, and he was found guilty on the clearest evidence of all the crimes laid to his charge. It was proved that he took insane pleasure in stabbing the victims of his lust and in observing the quivering of their flesh, and the fading lustre of their eyes as they expired. The confession of Prelati first made the judges acquainted with this horrid madness, and Gilles himself confirmed it before his death. Nearly a hundred children of the villagers around his two castles of Champtocé and Machecoue, had been missed within three years, the greater part, if not all, of whom were immolated to the lust or the cupidity of this monster. He imagined that he thus made the devil his friend, and that his recompense would be the secret of the philosopher's stone.

Gilles and Prelati were both condemned to be burned alive. At the place of execution they assumed the air of penitence and religion. Gilles tenderly embraced Prelati, saying, "*Farewell, friend Francis! In this world we shall never meet again; but let us place our hopes in God; we shall see each other in Paradise.*" Out of consideration for his high rank and connexions, the punishment of the marshal was so far mitigated, that he was not burned alive like Prelati. He was first strangled, and then thrown into the flames: his body, when half consumed, was given over to his relatives for interment, while that of the Italian was burned to ashes, and then scattered to the winds.³⁹

JACQUES CŒUR.

This remarkable pretender to the secret of the philosopher's stone was contemporary with the last mentioned. He was a great personage at the court of Charles VII., and in the events of his reign played a prominent part. From a very humble origin he rose to the highest honours of the state, and amassed enormous wealth by speculation and plunder of the country which he should have served. It was to hide his delinquencies in this respect, and to divert attention from the real source of his riches, that he boasted of having discovered the art of transmuting the inferior metals into gold and silver.

His father was a goldsmith in the city of Bourges; but so reduced in circumstances towards the latter years of his life, that he was unable to pay the necessary fees to procure his son's admission into the guild. Young Jacques became, however, a workman in the Royal Mint of Bourges, in 1428, and behaved himself so well, and shewed so much knowledge of metallurgy, that he attained rapid promotion in that establishment. He had also the good fortune to make the acquaintance of the fair Agnes Sorel, by whom he was patronised and much esteemed. Jacques had now three things in his favour—ability, perseverance, and the countenance of the king's mistress. Many a man succeeds with but one of these to help him forward; and it would have been strange indeed if Jacques Cœur, who had them all, should have languished in obscurity. While still a young man, he was made master of the mint, in which he had been a journeyman, and installed at the same time into the vacant office of grand treasurer of the royal household.

He possessed an extensive knowledge of finance, and turned it wonderfully to his own advantage, as soon as he became entrusted

with extensive funds. He speculated in articles of the first necessity, and made himself popular by buying up grain, honey, wines, and other produce, till there was a scarcity, when he sold it again at enormous profit. Strong in the royal favour, he did not hesitate to oppress the poor by continual acts of forestalling and monopoly. As there is no enemy so bitter as the estranged friend, so of all the tyrants and trampers upon the poor, there is none so fierce and reckless as the upstart that sprang from their ranks. The offensive pride of Jacques Cœur to his inferiors was the theme of indignant reproach in his own city, and his cringing humility to those above him was as much an object of contempt to the aristocrats into whose society he thrust himself. But Jacques did not care for the former, and to the latter he was blind. He continued his career till he became the richest man in France, and so useful to the king that no important enterprise was set on foot until he had been consulted. He was sent, in 1446, on an embassy to Genoa, and in the following year to Pope Nicholas V. In both these missions he acquitted himself to the satisfaction of his sovereign, and was rewarded with a lucrative appointment, in addition to those which he already held.

In the year 1449, the English in Normandy, deprived of their great general, the Duke of Bedford, broke the truce with the French king, and took possession of a small town belonging to the Duke of Brittany. This was the signal for the recommencement of a war, in which the French regained possession of nearly the whole province. The money for this war was advanced, for the most part, by Jacques Cœur. When Rouen yielded to the French, and Charles made his triumphal entry into that city, accompanied by Dunois and his most famous generals, Jacques was among the most brilliant of his

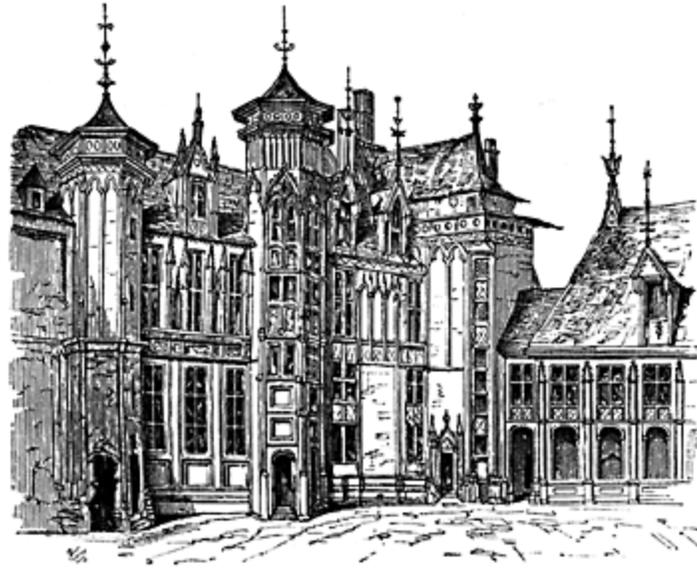
cortège. His chariot and horses vied with those of the king in the magnificence of their trappings; and his enemies said of him that he publicly boasted that he alone had driven out the English, and that the valour of the troops would have been nothing without his gold.

Dunois appears, also, to have been partly of the same opinion. Without disparaging the courage of the army, he acknowledged the utility of the able financier, by whose means they had been fed and paid, and constantly afforded him his powerful protection.

When peace returned, Jacques again devoted himself to commerce, and fitted up several galleys to trade with the Genoese. He also bought large estates in various parts of France; the chief of which were the baronies of St. Fargeau, Meneton, Salone, Maubranche, Meaune, St. Gerant de Vaux, and St. Aon de Boissy; the earldoms or counties of La Palisse, Champignelle, Beaumont, and Villeneuve la Genêt, and the marquisate of Toucy. He also procured for his son, Jean Cœur, who had chosen the Church for his profession, a post no less distinguished than that of Archbishop of Bourges.

Every body said that so much wealth could not have been honestly acquired; and both rich and poor longed for the day that should humble the pride of the man, whom the one class regarded as an upstart and the other as an oppressor. Jacques was somewhat alarmed at the rumours that were afloat respecting him, and of dark hints that he had debased the coin of the realm and forged the king's seal to an important document, by which he had defrauded the state of very considerable sums. To silence these rumours, he invited many alchemists from foreign countries to reside with him, and circulated a counter rumour, that he had discovered the secret of the

philosopher's stone. He also built a magnificent house in his native city, over the entrance of which he caused to be sculptured the emblems of that science. Some time afterwards he built another, no less splendid, at Montpellier, which he inscribed in a similar manner. He also wrote a treatise upon the hermetic philosophy, in which he pretended that he knew the secret of transmuting metals.



HOUSE OF JACQUES CŒUR, BOURGES.

But all these attempts to disguise his numerous acts of peculation proved unavailing; and he was arrested in 1452, and brought to trial on several charges. Upon one only, which the malice of his enemies invented to ruin him, was he acquitted; which was, that he had been accessory to the death, by poison, of his kind patroness, Agnes Sorel. Upon the others he was found guilty, and sentenced to be banished the kingdom, and to pay the enormous fine of four hundred thousand crowns. It was proved that he had forged the king's seal; that in his capacity of master of the mint of Bourges, he had debased, to a very great extent, the gold and silver coin of the realm; and that he had not hesitated to supply the Turks with arms and money to enable them to carry on war against their Christian neighbours, for which service he had received the most munificent recompenses.

Charles VII. was deeply grieved at his condemnation, and believed to the last that he was innocent. By his means the fine was reduced within a sum which Jacques Cœur could pay. After remaining for some time in prison, he was liberated, and left France with a large sum of money, part of which, it was alleged, was secretly paid him by Charles out of the produce of his confiscated estates. He retired to Cyprus, where he died about 1460, the richest and most conspicuous personage of the island.

The writers upon alchymy all claim Jacques Cœur as a member of their fraternity, and treat as false and libellous the more rational explanation of his wealth which the records of his trial afford. Pierre Borel, in his *Antiquités Gauloises*, maintains the opinion that Jacques was an honest man, and that he made his gold out of lead and copper by means of the philosopher's stone. The alchymic adepts in general were of the same opinion; but they found it difficult to persuade even his contemporaries of the fact. Posterity is still less likely to believe it.

INFERIOR ADEPTS OF THE FOURTEENTH AND FIFTEENTH CENTURIES.

Many other pretenders to the secrets of the philosopher's stone appeared in every country in Europe, during the fourteenth and fifteenth centuries. The possibility of transmutation was so generally admitted, that every chemist was more or less an alchymist. Germany, Holland, Italy, Spain, Poland, France, and England produced thousands of obscure adepts, who supported themselves, in the pursuit of their chimera, by the more profitable resources of astrology and divination. The monarchs of Europe were no less persuaded than their subjects of the possibility of discovering the

philosopher's stone. Henry VI. and Edward IV. of England encouraged alchemy. In Germany, the Emperors Maximilian, Rudolph, and Frederic II. devoted much of their attention to it; and every inferior potentate within their dominions imitated their example. It was a common practice in Germany, among the nobles and petty sovereigns, to invite an alchemist to take up his residence among them, that they might confine him in a dungeon till he made gold enough to pay millions for his ransom. Many poor wretches suffered perpetual imprisonment in consequence. A similar fate appears to have been intended by Edward II. for Raymond Lulli, who, upon the pretence that he was thereby honoured, was accommodated with apartments in the Tower of London. He found out in time the trick that was about to be played him, and managed to make his escape; some of his biographers say, by jumping into the Thames, and swimming to a vessel that lay waiting to receive him. In the sixteenth century, the same system was pursued, as will be shewn more fully in the life of Seton the Cosmopolite.

The following is a catalogue of the chief authors upon alchemy, who flourished during this epoch, and whose lives and adventures are either unknown or are unworthy of more detailed notice. John Dowston, an Englishman, lived in 1315, and wrote two treatises on the philosopher's stone. Richard, or, as some call him, Robert, also an Englishman, lived in 1330, and wrote a work entitled *Correctorium Alchymixæ*, which was much esteemed till the time of Paracelsus. In the same year lived Peter of Lombardy, who wrote what he called a *Complete Treatise upon the Hermetic Science*, an abridgment of which was afterwards published by Lacini, a monk of Calabria. In 1330 the most famous alchemist of Paris was one

Odomare, whose work, *De Practica Magistri*, was for a long time a hand-book among the brethren of the science. John de Rupecissa, a French monk of the order of St. Francis, flourished in 1357, and pretended to be a prophet as well as an alchymist. Some of his prophecies were so disagreeable to Pope Innocent VI., that the pontiff determined to put a stop to them, by locking up the prophet in the dungeons of the Vatican. It is generally believed that he died there, though there is no evidence of the fact. His chief works are, the *Book of Light*, the *Five Essences*, the *Heaven of Philosophers*, and his grand work, *De Confectione Lapidis*. He was not thought a shining light among the adepts. Ortholani was another pretender, of whom nothing is known, but that he exercised the arts of alchymy and astrology at Paris, shortly before the time of Nicholas Flamel. His work on the practice of alchymy was written in that city in 1358. Isaac of Holland wrote, it is supposed, about this time; and his son also devoted himself to the science. Nothing worth repeating is known of their lives. Boerhaave speaks with commendation of many passages in their works, and Paracelsus esteemed them highly: the chief are, *De Triplici Ordine Elixiris et Lapidis Theoria*, printed at Berne in 1608; and *Mineralia Opera, seu de Lapide Philosophico*, printed at Middleburg in 1600. They also wrote eight other works upon the same subject. Koffstky, a Pole, wrote an alchymical treatise, entitled *The Tincture of Minerals*, about the year 1488. In this list of authors a royal name must not be forgotten. Charles VI. of France, one of the most credulous princes of the day, whose court absolutely swarmed with alchymists, conjurers, astrologers, and quacks of every description, made several attempts to discover the philosopher's stone, and thought he knew so much about it, that he determined to

enlighten the world with a treatise; it is called the *Royal Work of Charles VI. of France, and the Treasure of Philosophy*. It is said to be the original from which Nicholas Flamel took the idea of his *Désir désiré*. Lenglet du Fresnoy says it is very allegorical, and utterly incomprehensible. For a more complete list of the hermetic philosophers of the fourteenth and fifteenth centuries, the reader is referred to the third volume of Lenglet's History, already quoted.

PROGRESS OF THE INFATUATION DURING THE
SIXTEENTH AND SEVENTEENTH CENTURIES.—
PRESENT STATE OF THE SCIENCE.

During the sixteenth and seventeenth centuries, the search for the philosopher's stone was continued by thousands of the enthusiastic and the credulous; but a great change was introduced during this period. The eminent men who devoted themselves to the study totally changed its aspect, and referred to the possession of their wondrous stone and elixir, not only the conversion of the base into the precious metals, but the solution of all the difficulties of other sciences. They pretended that by its means man would be brought into closer communion with his Maker; that disease and sorrow would be banished from the world; and that "the millions of spiritual beings who walk the earth unseen" would be rendered visible, and become the friends, companions, and instructors of mankind. In the seventeenth century more especially, these poetical and fantastic doctrines excited the notice of Europe; and from Germany, where they had been first disseminated by Rosencreutz, spread into France

and England, and ran away with the sound judgment of many clever but too enthusiastic searchers for the truth. Paracelsus, Dee, and many others of less note, were captivated by the grace and beauty of the new mythology, which was arising to adorn the literature of Europe. Most of the alchemists of the sixteenth century, although ignorant of the Rosicrucians as a sect, were, in some degree, tinctured with their fanciful tenets: but before we speak more fully of these poetical visionaries, it will be necessary to resume the history of the hermetic folly, and trace the gradual change that stole over the dreams of the adepts. It will be seen that the infatuation increased rather than diminished as the world grew older.

AUGURELLO.

Among the alchemists who were born in the fifteenth, and distinguished themselves in the sixteenth century, the first in point of date is John Aurelio Augurello. He was born at Rimini in 1441, and became professor of the *belles lettres* at Venice and Trevisa. He was early convinced of the truth of the hermetic science, and used to pray to God that he might be happy enough to discover the philosopher's stone. He was continually surrounded by the paraphernalia of chemistry, and expended all his wealth in the purchase of drugs and metals. He was also a poet, but of less merit than pretensions. His *Chrysopeia*, in which he pretended to teach the art of making gold, he dedicated to Pope Leo X., in the hope that the pontiff would reward him handsomely for the compliment; but the pope was too good a judge of poetry to be pleased with the worse than mediocrity of his poem, and too good a philosopher to approve of the strange doctrines which it inculcated; he was, therefore, far from gratified at

the dedication. It is said, that when Augurello applied to him for a reward, the pope, with great ceremony and much apparent kindness and cordiality, drew an empty purse from his pocket, and presented it to the alchemist, saying, that since he was able to make gold, the most appropriate present that could be made him, was a purse to put it in. This scurvy reward was all that the poor alchemist ever got either for his poetry or his alchemy. He died in a state of extreme poverty, in the eighty-third year of his age.

CORNELIUS AGRIPPA.

This alchemist has left a distinguished reputation. The most extraordinary tales were told and believed of his powers. He could turn iron into gold by his mere word. All the spirits of the air and demons of the earth were under his command, and bound to obey him in everything. He could raise from the dead the forms of the great men of other days, and make them appear, “in their habit as they lived,” to the gaze of the curious who had courage enough to abide their presence.



CORNELIUS AGRIPPA.

He was born at Cologne in 1486, and began at an early age the study of chemistry and philosophy. By some means or other, which have never been very clearly explained, he managed to impress his contemporaries with a great idea of his wonderful attainments. At the early age of twenty, so great was his reputation as an alchymist, that the principal adepts of Paris wrote to Cologne, inviting him to settle in France, and aid them with his experience in discovering the philosopher's stone. Honours poured upon him in thick succession; and he was highly esteemed by all the learned men of his time. Melancthon speaks of him with respect and commendation. Erasmus also bears testimony in his favour; and the general voice of his age proclaimed him a light of literature and an ornament to philosophy. Some men, by dint of excessive egotism, manage to persuade their contemporaries that they are very great men indeed: they publish their acquirements so loudly in people's ears, and keep up their own praises so incessantly, that the world's applause is actually taken by storm. Such seems to have been the case with Agrippa. He called himself a sublime theologian, an excellent jurisconsult, an able physician, a great philosopher, and a successful alchymist. The world at last took him at his word; and thought that a man who talked so big, must have some merit to recommend him,—that it was, indeed, a great trumpet which sounded so obstreperous a blast. He was made secretary to the Emperor Maximilian, who conferred upon him the title of chevalier, and gave him the honorary command of a regiment. He afterwards became professor of Hebrew and the *belles lettres* at the University of Dôle, in France; but quarrelling with the Franciscan monks upon some knotty points of divinity, he was obliged to quit the town. He took refuge in London, where he taught Hebrew and

cast nativities, for about a year. From London he proceeded to Pavia, and gave lectures upon the writings, real or supposed, of Hermes Trismegistus; and might have lived there in peace and honour, had he not again quarrelled with the clergy. By their means his position became so disagreeable that he was glad to accept an offer made him by the magistracy of Metz, to become their syndic and advocate-general. Here, again, his love of disputation made him enemies: the theological wiseacres of that city asserted that St. Ann had three husbands, in which opinion they were confirmed by the popular belief of the day. Agrippa needlessly ran foul of this opinion, or prejudice as he called it, and thereby lost much of his influence. Another dispute, more creditable to his character, occurred soon after, and sank him for ever in the estimation of the Metzians. Humanely taking the part of a young girl who was accused of witchcraft, his enemies asserted that he was himself a sorcerer, and raised such a storm over his head, that he was forced to fly the city. After this he became physician to Louisa de Savoy, mother of King Francis I. This lady was curious to know the future, and required her physician to cast her nativity. Agrippa replied that he would not encourage such idle curiosity. The result was, he lost her confidence, and was forthwith dismissed. If it had been through his belief in the worthlessness of astrology, that he had made his answer, we might admire his honest and fearless independence; but when it is known that, at the very same time, he was in the constant habit of divination and fortune-telling, and that he was predicting splendid success, in all his undertakings, to the Constable of Bourbon, we can only wonder at his thus estranging a powerful friend through mere petulance and perversity.

He was about this time invited, both by Henry VIII. of England, and Margaret of Austria, governess of the Low Countries, to fix his residence in their dominions. He chose the service of the latter, by whose influence he was made historiographer to the Emperor Charles V. Unfortunately for Agrippa, he never had stability enough to remain long in one position, and offended his patrons by his restlessness and presumption. After the death of Margaret he was imprisoned at Brussels, on a charge of sorcery. He was released after a year; and quitting the country, experienced many vicissitudes. He died in great poverty in 1534, aged forty-eight years.

While in the service of Margaret of Austria, he resided principally at Louvain, in which city he wrote his famous work on the *Vanity and Nothingness of Human Knowledge*. He also wrote to please his royal mistress, a treatise upon the *Superiority of the Female Sex*, which he dedicated to her in token of his gratitude for the favours she had heaped upon him. The reputation he left behind him in these provinces was any thing but favourable. A great number of the marvellous tales that are told of him relate to this period of his life. It was said, that the gold which he paid to the traders with whom he dealt, always looked remarkably bright, but invariably turned into pieces of slate and stone in the course of four-and-twenty hours. Of this spurious gold he was believed to have made large quantities by the aid of the devil, who, it would appear from this, had but a very superficial knowledge of alchymy, and much less than the Maréchal de Rays gave him credit for. The Jesuit Delrio, in his book on magic and sorcery, relates a still more extraordinary story of him. One day, Agrippa left his house at Louvain, and intending to be absent for some time, gave the key of his study to his wife, with strict orders

that no one should enter it during his absence. The lady herself, strange as it may appear, had no curiosity to pry into her husband's secrets, and never once thought of entering the forbidden room; but a young student, who had been accommodated with an attic in the philosopher's house, burned with a fierce desire to examine the study; hoping, perchance, that he might purloin some book or implement which would instruct him in the art of transmuting metals. The youth, being handsome, eloquent, and, above all, highly complimentary to the charms of the lady, she was persuaded without much difficulty to lend him the key, but gave him strict orders not to remove any thing. The student promised implicit obedience, and entered Agrippa's study. The first object that caught his attention was a large *grimoire*, or book of spells, which lay open on the philosopher's desk. He sat himself down immediately and began to read. At the first word he uttered, he fancied he heard a knock at the door. He listened, but all was silent. Thinking that his imagination had deceived him, he read on, when immediately a louder knock was heard, which so terrified him, that he started to his feet. He tried to say "Come in," but his tongue refused its office, and he could not articulate a sound. He fixed his eyes upon the door, which, slowly opening, disclosed a stranger of majestic form, but scowling features, who demanded sternly, why he was summoned? "I did not summon you," said the trembling student. "You did!" said the stranger, advancing angrily; "and the demons are not to be invoked in vain." The student could make no reply; and the demon, enraged that one of the uninitiated should have summoned him out of mere presumption, seized him by the throat and strangled him. When Agrippa returned, a few days afterwards, he found his house beset

with devils. Some of them were sitting on the chimney-pots, kicking up their legs in the air; while others were playing at leapfrog on the very edge of the parapet. His study was so filled with them, that he found it difficult to make his way to his desk. When, at last, he had elbowed his way through them, he found his book open, and the student lying dead upon the floor. He saw immediately how the mischief had been done; and dismissing all the inferior imps, asked the principal demon how he could have been so rash as to kill the young man. The demon replied, that he had been needlessly invoked by an insulting youth, and could do no less than kill him for his presumption. Agrippa reprimanded him severely, and ordered him immediately to reanimate the dead body, and walk about with it in the market-place for the whole of the afternoon. The demon did so; the student revived, and putting his arm through that of his unearthly murderer, walked very lovingly with him in sight of all the people. At sunset, the body fell down again, cold and lifeless as before, and was carried by the crowd to the hospital, it being the general opinion that he had expired in a fit of apoplexy. His conductor immediately disappeared. When the body was examined, marks of strangulation were found on the neck, and prints of the long claws of the demon on various parts of it. These appearances, together with a story, which soon obtained currency, that the companion of the young man had vanished in a cloud of flame and smoke, opened people's eyes to the truth. The magistrates of Louvain instituted inquiries, and the result was, that Agrippa was obliged to quit the town.

Other authors besides Delrio relate similar stories of this philosopher. The world in those days was always willing enough to

believe in tales of magic and sorcery; and when, as in Agrippa's case, the alleged magician gave himself out for such, and claimed credit for the wonders he worked, it is not surprising that the age should have allowed his pretensions. It was dangerous boasting, which sometimes led to the stake or the gallows, and therefore was thought to be not without foundation. Paulus Jovius, in his *Eulogia Doctorum Virorum*, says, that the devil, in the shape of a large black dog, attended Agrippa wherever he went. Thomas Nash, in his *Adventures of Jack Wilton*, relates, that, at the request of Lord Surrey, Erasmus, and some other learned men, Agrippa called up from the grave many of the great philosophers of antiquity; among others, Tully, whom he caused to re-deliver his celebrated oration for Roscius. He also shewed Lord Surrey, when in Germany, an exact resemblance in a glass of his mistress, the fair Geraldine. She was represented on a couch weeping for the absence of her lover. Lord Surrey made a note of the exact time at which he saw this vision, and ascertained afterwards that his mistress was actually so employed at the very minute. To Thomas Lord Cromwell, Agrippa represented King Henry VIII. hunting in Windsor Park, with the principal lords of his court; and to please the Emperor Charles V. he summoned King David and King Solomon from the tomb.

Naudé, in his "*Apology for the great Men who have been falsely suspected of Magic*," takes a great deal of pains to clear Agrippa from the imputations cast upon him by Delrio, Paulus Jovius, and other such ignorant and prejudiced scribblers. Such stories demanded refutation in the days of Naudé, but they may now be safely left to decay in their own absurdity. That they should have attached, however, to the memory of a man who claimed the power of making

iron obey him when he told it to become gold, and who wrote such a work as that upon magic, which goes by his name, is not at all surprising.

PARACELSUS.

This philosopher, called by Naudé “the zenith and rising sun of all the alchymists,” was born at Einsiedeln, near Zurich, in the year 1493. His true name was Hohenheim; to which, as he himself informs us, were prefixed the baptismal names of Aureolus Theophrastus Bombastes Paracelsus. The last of these he chose for his common designation while he was yet a boy; and rendered it, before he died, one of the most famous in the annals of his time. His father, who was a physician, educated his son for the same pursuit. The latter was an apt scholar, and made great progress. By chance the work of Isaac Hollandus fell into his hands, and from that time he became smitten with the mania of the philosopher’s stone. All his thoughts henceforth were devoted to metallurgy; and he travelled into Sweden that he might visit the mines of that country, and examine the ores while they yet lay in the bowels of the earth. He also visited Trithemius at the monastery of Spannheim, and obtained instructions from him in the science of alchymy. Continuing his travels, he proceeded through Prussia and Austria into Turkey, Egypt, and Tartary, and thence returning to Constantinople, learned, as he boasted, the art of transmutation, and became possessed of the *elixir vitæ*. He then established himself as a physician in his native Switzerland at Zurich, and commenced writing works upon alchymy and medicine, which immediately fixed the attention of Europe. Their great obscurity was no impediment to their fame; for the less

the author was understood, the more the demonologists, fanatics, and philosopher's-stone hunters seemed to appreciate him. His fame as a physician kept pace with that which he enjoyed as an alchemist, owing to his having effected some happy cures by means of mercury and opium,—drugs unceremoniously condemned by his professional brethren. In the year 1526, he was chosen professor of physics and natural philosophy in the University of Basle, where his lectures attracted vast numbers of students. He denounced the writings of all former physicians as tending to mislead; and publicly burned the works of Galen and Avicenna, as quacks and impostors. He exclaimed, in presence of the admiring and half-bewildered crowd, who assembled to witness the ceremony, that there was more knowledge in his shoe-strings than in the writings of these physicians. Continuing in the same strain, he said, all the Universities in the world were full of ignorant quacks; but that he, Paracelsus, overflowed with wisdom. “You will all follow my new system,” said he, with furious gesticulations, “Avicenna, Galen, Rhazis, Montagnana, Memé,—you will all follow me, ye professors of Paris, Montpellier, Germany, Cologne, and Vienna! and all ye that dwell on the Rhine and the Danube,—ye that inhabit the isles of the sea; and ye also, Italians, Dalmatians, Athenians, Arabians, Jews,—ye will all follow my doctrines, for I am the monarch of medicine!”



PARACELSUS.

But he did not long enjoy the esteem of the good citizens of Basle. It is said that he indulged in wine so freely, as not unfrequently to be seen in the streets in a state of intoxication. This was ruinous for a physician, and his good fame decreased rapidly. His ill fame increased in still greater proportion, especially when he assumed the airs of a sorcerer. He boasted of the legions of spirits at his command; and of one especially, which he kept imprisoned in the hilt of his sword. Wetteras, who lived twenty-seven months in his service, relates that he often threatened to invoke a whole army of demons, and shew him the great authority which he could exercise over them. He let it be believed that the spirit in his sword had custody of the elixir of life, by means of which he could make any one live to be as old as the antediluvians. He also boasted that he had a spirit at his command, called "Azoth," whom he kept imprisoned in a jewel; and in many of the old portraits he is represented with a jewel, inscribed with the word "Azoth, in his hand."

If a sober prophet has little honour in his own country, a drunken one has still less. Paracelsus found it at last convenient to quit Basle, and establish himself at Strasbourg. The immediate cause of this change of residence was as follows. A citizen lay at the point of death, and was given over by all the physicians of the town. As a last resource Paracelsus was called in, to whom the sick man promised a magnificent recompense, if, by his means, he were cured. Paracelsus gave him two small pills, which the man took, and rapidly recovered. When he was quite well, Paracelsus sent for his fee; but the citizen had no great opinion of the value of a cure which had been so speedily effected. He had no notion of paying a handful of gold for

two pills, although they had saved his life, and he refused to pay more than the usual fee for a single visit. Paracelsus brought an action against him, and lost it. This result so exasperated him, that he left Basle in high dudgeon. He resumed his wandering life, and travelled in Germany and Hungary, supporting himself as he went on the credulity and infatuation of all classes of society. He cast nativities—told fortunes—aided those who had money to throw away upon the experiment, to find the philosopher's stone—prescribed remedies for cows and pigs, and aided in the recovery of stolen goods. After residing successively at Nuremburg, Augsburg, Vienna, and Mindelheim, he retired in the year 1541 to Saltzbourg, and died in a state of abject poverty in the hospital of that town.

If this strange charlatan found hundreds of admirers during his life, he found thousands after his death. A sect of Paracelsists sprang up in France and Germany, to perpetuate the extravagant doctrines of their founder upon all the sciences, and upon alchemy in particular. The chief leaders were Bodenstein and Dorneus. The following is a summary of his doctrine, founded upon the supposed existence of the philosopher's stone; it is worth preserving from its very absurdity, and is altogether unparalleled in the history of philosophy. First of all, he maintained that the contemplation of the perfection of the Deity sufficed to procure all wisdom and knowledge; that the Bible was the key to the theory of all diseases, and that it was necessary to search into the Apocalypse to know the signification of magic medicine. The man who blindly obeyed the will of God, and who succeeded in identifying himself with the celestial intelligences, possessed the philosopher's stone—he could cure all diseases, and prolong life to as many centuries as he pleased; it being

by the very same means that Adam and the antediluvian patriarchs prolonged theirs. Life was an emanation from the stars—the sun governed the heart, and the moon the brain. Jupiter governed the liver, Saturn the gall, Mercury the lungs, Mars the bile, and Venus the loins. In the stomach of every human being there dwelt a demon, or intelligence, that was a sort of alchemist in his way, and mixed, in their due proportions, in his crucible, the various aliments that were sent into that grand laboratory, the belly.⁴⁰ He was proud of the title of magician, and boasted that he kept up a regular correspondence with Galen from hell; and that he often summoned Avicenna from the same regions to dispute with him on the false notions he had promulgated respecting alchymy, and especially regarding potable gold and the elixir of life. He imagined that gold could cure ossification of the heart, and, in fact, all diseases, if it were gold which had been transmuted from an inferior metal by means of the philosopher's stone, and if it were applied under certain conjunctions of the planets. The mere list of the works in which he advances these frantic imaginings, which he called a doctrine, would occupy several pages.

GEORGE AGRICOLA.

This alchemist was born in the province of Misnia, in 1494. His real name was *Bauer*, meaning a husbandman, which, in accordance with the common fashion of his age, he latinised into Agricola. From his early youth, he delighted in the visions of the hermetic science. Ere he was sixteen, he longed for the great elixir which was to make him live for seven hundred years, and for the stone which was to procure him wealth to cheer him in his multiplicity of days. He

published a small treatise upon the subject at Cologne, in 1531, which obtained him the patronage of the celebrated Maurice duke of Saxony. After practising for some years as a physician at Joachimsthal, in Bohemia, he was employed by Maurice as superintendent of the silver mines of Chemnitz. He led a happy life among the miners, making various experiments in alchemy while deep in the bowels of the earth. He acquired a great knowledge of metals, and gradually got rid of his extravagant notions about the philosopher's stone. The miners had no faith in alchemy; and they converted him to their way of thinking, not only in that but in other respects. From their legends, he became firmly convinced that the bowels of the earth were inhabited by good and evil spirits, and that firedamp and other explosions sprang from no other causes than the mischievous propensities of the latter. He died in the year 1555, leaving behind him the reputation of a very able and intelligent man.

DENIS ZACHAIRE.

Autobiography, written by a wise man who was once a fool, is not only the most instructive, but the most delightful of reading. Denis Zachaire, an alchemist of the sixteenth century, has performed this task, and left a record of his folly and infatuation in pursuit of the philosopher's stone, which well repays perusal. He was born in the year 1510, of an ancient family in Guienne, and was early sent to the university of Bordeaux, under the care of a tutor to direct his studies. Unfortunately his tutor was a searcher for the grand elixir, and soon rendered his pupil as mad as himself upon the subject. With this introduction, we will allow Denis Zachaire to speak for himself, and continue his narrative in his own words: "I received from home,"

says he, “the sum of two hundred crowns for the expenses of myself and master; but before the end of the year, all our money went away in the smoke of our furnaces. My master, at the same time, died of a fever, brought on by the parching heat of our laboratory, from which he seldom or never stirred, and which was scarcely less hot than the arsenal of Venice. His death was the more unfortunate for me, as my parents took the opportunity of reducing my allowance, and sending me only sufficient for my board and lodging, instead of the sum I required to continue my operations in alchymy.

“To meet this difficulty and get out of leading-strings, I returned home at the age of twenty-five, and mortgaged part of my property for four hundred crowns. This sum was necessary to perform an operation of the science, which had been communicated to me by an Italian at Toulouse, and who, as he said, had proved its efficacy. I retained this man in my service, that we might see the end of the experiment. I then, by means of strong distillations, tried to calcinate gold and silver; but all my labour was in vain. The weight of the gold I drew out of my furnace was diminished by one-half since I put it in, and my four hundred crowns were very soon reduced to two hundred and thirty. I gave twenty of these to my Italian, in order that he might travel to Milan, where the author of the receipt resided, and ask him the explanation of some passages which we thought obscure. I remained at Toulouse all the winter, in the hope of his return; but I might have remained there till this day if I had waited for him, for I never saw his face again.

“In the succeeding summer there was a great plague, which forced me to quit the town. I did not, however, lose sight of my

work. I went to Cahors, where I remained six months, and made the acquaintance of an old man, who was commonly known to the people as ‘the Philosopher;’ a name which, in country places, is often bestowed upon people whose only merit is, that they are less ignorant than their neighbours. I shewed him my collection of alchymical receipts, and asked his opinion upon them. He picked out ten or twelve of them, merely saying that they were better than the others. When the plague ceased, I returned to Toulouse, and recommenced my experiments in search of the stone. I worked to such effect that my four hundred crowns were reduced to one hundred and seventy.

“That I might continue my work on a safer method, I made acquaintance, in 1537, with a certain abbé who resided in the neighbourhood. He was smitten with the same mania as myself, and told me that one of his friends, who had followed to Rome in the retinue of the Cardinal d’Armagnac, had sent him from that city a new receipt which could not fail to transmute iron and copper, but which would cost two hundred crowns. I provided half this money, and the abbé the rest; and we began to operate at our joint expense. As we required spirits of wine for our experiment, I bought a tun of excellent *vin de Gaillac*. I extracted the spirit, and rectified it several times. We took a quantity of this, into which we put four marks of silver and one of gold that had been undergoing the process of calcination for a month. We put this mixture cleverly into a sort of horn-shaped vessel, with another to serve as a retort; and placed the whole apparatus upon our furnace to produce congelation. This experiment lasted a year; but, not to remain idle, we amused

ourselves with many other less important operations. We drew quite as much profit from these as from our great work.

“The whole of the year 1537 passed over without producing any change whatever; in fact we might have waited till doomsday for the congelation of our spirits of wine. However, we made a projection with it upon some heated quicksilver; but all was in vain. Judge of our chagrin, especially of that of the abbé, who had already boasted to all the monks of his monastery, that they had only to bring the large pump which stood in a corner of the cloister, and he would convert it into gold: but this ill luck did not prevent us from persevering. I once more mortgaged my paternal lands for four hundred crowns, the whole of which I determined to devote to a renewal of my search for the great secret. The abbé contributed the same sum; and with these eight hundred crowns I proceeded to Paris, a city more abounding with alchemists than any other in the world, resolved never to leave it until I had either found the philosopher’s stone or spent all my money. This journey gave the greatest offence to all my relations and friends, who, imagining that I was fitted to be a great lawyer, were anxious that I should establish myself in that profession. For the sake of quietness, I pretended, at last, that such was my object.

“After travelling for fifteen days, I arrived in Paris on the 9th of January 1539. I remained for a month almost unknown; but I had no sooner begun to frequent the amateurs of the science, and visited the shops of the furnace-makers, than I had the acquaintance of more than a hundred operative alchemists, each of whom had a different theory and a different mode of working.

Some of them preferred cementation; others sought the universal alkahest or dissolvent; and some of them boasted the great efficacy of the essence of emery. Some of them endeavoured to extract mercury from other metals, to fix it afterwards; and, in order that each of us should be thoroughly acquainted with the proceedings of the others, we agreed to meet somewhere every night and report progress. We met sometimes at the house of one, and sometimes in the garret of another; not only on week days, but on Sundays and the great festivals of the Church. 'Ah!' one used to say, 'if I had the means of recommencing this experiment, I should do something.' 'Yes,' said another, 'if my crucible had not cracked, I should have succeeded before now;' while a third exclaimed, with a sigh, 'If I had but had a round copper vessel of sufficient strength, I would have fixed mercury with silver.' There was not one among them who had not some excuse for his failure; but I was deaf to all their speeches. I did not want to part with my money to any of them, remembering how often I had been the dupe of such promises.

"A Greek at last presented himself; and with him I worked a long time uselessly upon nails made of cinnabar or vermilion. I was also acquainted with a foreign gentleman newly arrived in Paris, and often accompanied him to the shops of the goldsmiths to sell pieces of gold and silver, the produce, as he said, of his experiments. I stuck closely to him for a long time, in the hope that he would impart his secret. He refused for a long time, but acceded at last on my earnest entreaty, and I found that it was nothing more than an ingenious trick. I did not fail to inform my

friend the abbé, whom I had left at Toulouse, of all my adventures; and sent him, among other matters, a relation of the trick by which this gentleman pretended to turn lead into gold. The abbé still imagined that I should succeed at last, and advised me to remain another year in Paris, where I had made so good a beginning. I remained there three years; but, notwithstanding all my efforts, I had no more success than I had had elsewhere.

“I had just got to the end of my money, when I received a letter from the abbé, telling me to leave every thing, and join him immediately at Toulouse. I went accordingly, and found that he had received letters from the king of Navarre (grandfather of Henry IV.). This prince was a great lover of philosophy, full of curiosity, and had written to the abbé that I should visit him at Pau; and that he would give me three or four thousand crowns if I would communicate the secret I had learned from the foreign gentleman. The abbé’s ears were so tickled with the four thousand crowns, that he let me have no peace night or day until he had fairly seen me on the road to Pau. I arrived at that place in the month of May 1542. I worked away, and succeeded, according to the receipt I had obtained. When I had finished to the satisfaction of the king, he gave me the reward that I expected. Although he was willing enough to do me further service, he was dissuaded from it by the lords of his court; even by many of those who had been most anxious that I should come. He sent me then about my business, with many thanks; saying, that if there was any thing in his kingdom which he could give me—such as the produce of confiscations or

the like—he should be most happy. I thought I might stay long enough for these prospective confiscations, and never get them at last; and I therefore determined to go back to my friend the abbé.

“I learned that, on the road between Pau and Toulouse, there resided a monk who was very skilful in all matters of natural philosophy. On my return, I paid him a visit. He pitied me very much, and advised me, with much warmth and kindness of expression, not to amuse myself any longer with such experiments as these, which were all false and sophistical; but that I should read the good books of the old philosophers, where I might not only find the true matter of the science of alchymy, but learn also the exact order of operations which ought to be followed. I very much approved of this wise advice; but before I acted upon it, I went back to my abbé of Toulouse, to give him an account of the eight hundred crowns which we had had in common, and, at the same time, share with him such reward as I had received from the king of Navarre. If he was little satisfied with the relation of my adventures since our first separation, he appeared still less satisfied when I told him I had formed a resolution to renounce the search for the philosopher’s stone. The reason was that he thought me a good artist. Of our eight hundred crowns, there remained but one hundred and seventy-six. When I quitted the abbé, I went to my own house with the intention of remaining there, till I had read all the old philosophers, and of then proceeding to Paris.

“I arrived in Paris on the day after All Saints, of the year 1546, and devoted another year to the assiduous study of great

authors. Among others, the *Turba Philosophorum* of the Good Trevisan, the *Remonstrance of Nature to the Wandering Alchymist*, by Jean de Meung, and several others of the best books; but, as I had no right principles, I did not well know what course to follow.

“At last I left my solitude, not to see my former acquaintances, the adepts and operators, but to frequent the society of true philosophers. Among them I fell into still greater uncertainties; being, in fact, completely bewildered by the variety of operations which they shewed me. Spurred on, nevertheless, by a sort of frenzy or inspiration, I threw myself into the works of Raymond Lulli and of Arnold de Villeneuve. The reading of these, and the reflections I made upon them, occupied me for another year, when I finally determined on the course I should adopt. I was obliged to wait, however, until I had mortgaged another very considerable portion of my patrimony. This business was not settled until the beginning of Lent, 1549, when I commenced my operations. I laid in a stock of all that was necessary, and began to work the day after Easter. It was not, however, without some disquietude and opposition from my friends who came about me; one asking me what I was going to do, and whether I had not already spent money enough upon such follies? Another assured me that, if I bought so much charcoal, I should strengthen the suspicion already existing, that I was a coiner of base money. Another advised me to purchase some place in the magistracy, as I was already a Doctor of Laws. My relations spoke in terms still more annoying to me, and even threatened that, if I continued to make such a fool of myself, they would

send a posse of police-officers into my house, and break all my furnaces and crucibles into atoms. I was wearied almost to death by this continued persecution; but I found comfort in my work and in the progress of my experiment, to which I was very attentive, and which went on bravely from day to day. About this time, there was a dreadful plague in Paris, which interrupted all intercourse between man and man, and left me as much to myself as I could desire. I soon had the satisfaction to remark the progress and succession of the three colours which, according to the philosophers, always prognosticate the approaching perfection of the work. I observed them distinctly, one after the other; and next year, being Easter Sunday, 1550, I made the great trial. Some common quicksilver, which I put into a small crucible on the fire, was, in less than an hour, converted into very good gold. You may judge how great was my joy, but I took care not to boast of it. I returned thanks to God for the favour he had shewn me, and prayed that I might only be permitted to make such use of it as would redound to his glory.

“On the following day, I went towards Toulouse to find, the abbé, in accordance with a mutual promise, that we should communicate our discoveries to each other. On my way, I called in to see the sage monk who had assisted me with his counsels; but I had the sorrow to learn that they were both dead. After this, I would not return to my own home, but retired to another place, to await one of my relations whom I had left in charge of my estate. I gave him orders to sell all that belonged to me, as well movable as immovable—to pay my debts with the proceeds, and divide all the rest among those in any way related to me who

might stand in need of it, in order that they might enjoy some share of the good fortune which had befallen me. There was a great deal of talk in the neighbourhood about my precipitate retreat; the wisest of my acquaintance imagining that, broken down and ruined by my mad expenses, I sold my little remaining property, that I might go and hide my shame in distant countries.

“My relative already spoken of rejoined me on the 1st of July, after having performed all the business I had entrusted him with. We took our departure together, to seek a land of liberty. We first retired to Lausanne, in Switzerland, when, after remaining there for some time, we resolved to pass the remainder of our days in some of the most celebrated cities of Germany, living quietly and without splendour.”

Thus ends the story of Denis Zacheire, as written by himself. He has not been so candid at its conclusion as at its commencement, and has left the world in doubt as to his real motives for pretending that he had discovered the philosopher’s stone. It seems probable that the sentence he puts into the mouths of his wisest acquaintances was the true reason of his retreat; that he was, in fact, reduced to poverty, and hid his shame in foreign countries. Nothing further is known of his life, and his real name has never yet been discovered. He wrote a work on alchymy, entitled *The true Natural Philosophy of Metals*.

DR. DEE AND EDWARD KELLY.

John Dee and Edward Kelly claim to be mentioned together, having been so long associated in the same pursuits, and undergone

so many strange vicissitudes in each other's society. Dee was altogether a wonderful man, and had he lived in an age when folly and superstition were less rife, he would, with the same powers which he enjoyed, have left behind him a bright and enduring reputation. He was born in London in the year 1527, and very early manifested a love for study. At the age of fifteen he was sent to Cambridge, and delighted so much in his books, that he passed regularly eighteen hours every day among them. Of the other six, he devoted four to sleep and two for refreshment. Such intense application did not injure his health, and could not fail to make him one of the first scholars of his time. Unfortunately, however, he quitted the mathematics and the pursuits of true philosophy, to indulge in the unprofitable reveries of the occult sciences. He studied alchymy, astrology, and magic, and thereby rendered himself obnoxious to the authorities at Cambridge. To avoid persecution, he was at last obliged to retire to the university of Louvain; the rumours of sorcery that were current respecting him rendering his longer stay in England not altogether without danger. He found at Louvain many kindred spirits who had known Cornelius Agrippa while he resided among them, and by whom he was constantly entertained with the wondrous deeds of that great master of the hermetic mysteries. From their conversation he received much encouragement to continue the search for the philosopher's stone, which soon began to occupy nearly all his thoughts.



DR. DEE.

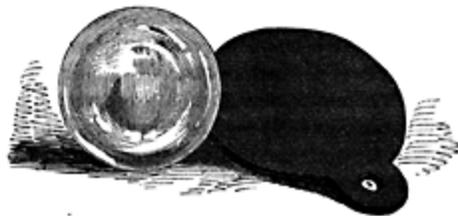
He did not long remain on the Continent, but returned to England in 1551, being at that time in the twenty-fourth year of his age. By the influence of his friend Sir John Cheek, he was kindly received at the court of King Edward VI., and rewarded (it is difficult to say for what) with a pension of one hundred crowns. He continued for several years to practise in London as an astrologer; casting nativities, telling fortunes, and pointing out lucky and unlucky days. During the reign of Queen Mary he got into trouble, being suspected of heresy, and charged with attempting Mary's life by means of enchantments. He was tried for the latter offence, and acquitted; but was retained in prison on the former charge, and left to the tender mercies of Bishop Bonner. He had a very narrow escape from being burned in Smithfield, but he somehow or other contrived to persuade that fierce bigot that his orthodoxy was unimpeachable, and was set at liberty in 1555.

On the accession of Elizabeth, a brighter day dawned upon him. During her retirement at Woodstock, her servants appear to have consulted him as to the time of Mary's death, which circumstance no

doubt first gave rise to the serious charge for which he was brought to trial. They now came to consult him more openly as to the fortunes of their mistress; and Robert Dudley, the celebrated Earl of Leicester, was sent by command of the Queen herself to know the most auspicious day for her coronation. So great was the favour he enjoyed, that, some years afterwards, Elizabeth condescended to pay him a visit at his house in Mortlake, to view his museum of curiosities, and when he was ill, sent her own physician to attend upon him.

Astrology was the means whereby he lived, and he continued to practise it with great assiduity; but his heart was in alchemy. The philosopher's stone and the elixir of life haunted his daily thoughts and his nightly dreams. The Talmudic mysteries, which he had also deeply studied, impressed him with the belief, that he might hold converse with spirits and angels, and learn from them all the mysteries of the universe. Holding the same idea as the then obscure sect of the Rosicrucians, some of whom he had perhaps encountered in his travels in Germany, he imagined that, by means of the philosopher's stone, he could summon these kindly spirits at his will. By dint of continually brooding upon the subject, his imagination became so diseased, that he at last persuaded himself that an angel appeared to him, and promised to be his friend and companion as long as he lived. He relates that, one day, in November 1582, while he was engaged in fervent prayer, the window of his museum looking towards the west suddenly glowed with a dazzling light, in the midst of which, in all his glory, stood the great angel Uriel. Awe and wonder rendered him speechless; but the angel smiling graciously upon him, gave him a crystal, of a convex form, and told him that

whenever he wished to hold converse with the beings of another sphere, he had only to gaze intently upon it, and they would appear in the crystal, and unveil to him all the secrets of futurity.⁴¹ Thus saying, the angel disappeared. Dee found from experience of the crystal that it was necessary that all the faculties of the soul should be concentrated upon it, otherwise the spirits did not appear. He also found that he could never recollect the conversations he had with the angels. He therefore determined to communicate the secret to another person, who might converse with the spirit while he (Dee) sat in another part of the room, and took down in writing the revelations which they made.



SHEW-STONE OF DR. DEE, IN THE BRITISH MUSEUM.

He had at this time in his service, as his assistant, one Edward Kelly, who, like himself, was crazy upon the subject of the philosopher's stone. There was this difference, however, between them, that, while Dee was more of an enthusiast than an impostor, Kelly was more of an impostor than an enthusiast. In early life he was a notary, and had the misfortune to lose both his ears for forgery. This mutilation, degrading enough in any man, was destructive to a philosopher; Kelly, therefore, lest his wisdom should suffer in the world's opinion, wore a black skull-cap, which, fitting close to his head, and descending over both his cheeks, not only concealed his loss, but gave him a very solemn and oracular

appearance. So well did he keep his secret, that even Dee, with whom he lived so many years, appears never to have discovered it. Kelly, with this character, was just the man to carry on any piece of roguery for his own advantage, or to nurture the delusions of his master for the same purpose. No sooner did Dee inform him of the visit he had received from the glorious Uriel, than Kelly expressed such a fervour of belief, that Dee's heart glowed with delight. He set about consulting his crystal forthwith, and on the 2d of December, 1581, the spirits appeared, and held a very extraordinary discourse with Kelly, which Dee took down in writing. The curious reader may see this farrago of nonsense among the Harleian Mss. in the British Museum. The later consultations were published in a folio volume, in 1659, by Dr. Meric Casaubon, under the title of *A true and faithful Relation of what passed between Dr. John Dee and some Spirits; tending, had it succeeded, to a general Alteration of most States and Kingdoms in the World.*⁴²

The fame of these wondrous colloquies soon spread over the country, and even reached the Continent. Dee at the same time pretended to be in possession of the *elixir vitæ*, which he stated he had found among the ruins of Glastonbury Abbey, in Somersetshire. People flocked from far and near to his house at Mortlake to have their nativities cast, in preference to visiting astrologers of less renown. They also longed to see a man who, according to his own account, would never die. Altogether, he carried on a very profitable trade, but spent so much in drugs and metals to work out some peculiar process of transmutation, that he never became rich.

About this time there came into England a wealthy polish nobleman, named Albert Laski, Count Palatine of Siradz. His object

was principally, he said, to visit the court of Queen Elizabeth, the fame of whose glory and magnificence had reached him in distant Poland. Elizabeth received this flattering stranger with the most splendid hospitality, and appointed her favourite Leicester to shew him all that was worth seeing in England. He visited all the curiosities of London and Westminster, and from thence proceeded to Oxford and Cambridge, that he might converse with some of the great scholars whose writings shed lustre upon the land of their birth. He was very much disappointed at not finding Dr. Dee among them, and told the Earl of Leicester that he would not have gone to Oxford if he had known that Dee was not there. The earl promised to introduce him to the great alchymist on their return to London, and the Pole was satisfied. A few days afterwards, the earl and Laski being in the antechamber of the Queen, awaiting an audience of her majesty, Dr. Dee arrived on the same errand, and was introduced to the Pole.⁴³ An interesting conversation ensued, which ended by the stranger inviting himself to dine with the astrologer at his house at Mortlake. Dee returned home in some tribulation, for he found he had not money enough, without pawning his plate, to entertain Count Laski and his retinue in a manner becoming their dignity. In this emergency he sent off an express to the Earl of Leicester, stating frankly the embarrassment he laboured under, and praying his good offices in representing the matter to her majesty. Elizabeth immediately sent him a present of twenty pounds.

On the appointed day Count Laski came, attended by a numerous retinue, and expressed such open and warm admiration of the wonderful attainments of his host, that Dee turned over in his own mind how he could bind irretrievably to his interests a man who

seemed so well inclined to become his friend. Long acquaintance with Kelly had imbued him with all the roguery of that personage, and he resolved to make the Pole pay dearly for his dinner. He found out before many days that he possessed great estates in his own country, as well as great influence, but that an extravagant disposition had reduced him to temporary embarrassment. He also discovered that he was a firm believer in the philosopher's stone and the water of life. He was therefore just the man upon whom an adventurer might fasten himself. Kelly thought so too; and both of them set to work to weave a web, in the meshes of which they might firmly entangle the rich and credulous stranger. They went very cautiously about it; first throwing out obscure hints of the stone and the elixir, and finally of the spirits, by means of whom they could turn over the pages of the book of futurity, and read the awful secrets inscribed therein. Laski eagerly implored that he might be admitted to one of their mysterious interviews with Uriel and the angels; but they knew human nature too well to accede at once to the request. To the count's entreaties they only replied by hints of the difficulty or impropriety of summoning the spirits in the presence of a stranger, or of one who might perchance have no other motive than the gratification of a vain curiosity; but they only meant to whet the edge of his appetite by this delay, and would have been sorry indeed if the count had been discouraged. To shew how exclusively the thoughts both of Dee and Kelly were fixed upon their dupe at this time, it is only necessary to read the introduction to their first interview with the spirits, related in the volume of Dr. Casaubon. The entry made by Dee, under the date of the 25th of May, 1583, says, that when the spirit appeared to them, "I [John Dee] and E. K. [Edward Kelly] sat

together, conversing of that noble Polonian Albertus Laski, his great honour here with us obtained, and of his great liking among all sorts of the people.” No doubt they were discussing how they might make the most of the “noble Polonian,” and concocting the fine story with which they afterwards excited his curiosity, and drew him firmly within their toils. “Suddenly,” says Dee, as they were thus employed, “there seemed to come out of the oratory a spiritual creature, like a pretty girl of seven or nine years of age, attired on her head, with her hair rolled up before and hanging down behind, with a gown of silk, of changeable red and green, and with a train. She seemed to play up and down, and seemed to go in and out behind the books; and as she seemed to go between them, the books displaced themselves, and made way for her.”

With such tales as these they lured on the Pole from day to day, and at last persuaded him to be a witness of their mysteries. Whether they played off any optical delusions upon him, or whether, by the force of a strong imagination, he deluded himself, does not appear, but certain it is that he became a complete tool in their hands, and consented to do whatever they wished him. Kelly, at these interviews, placed himself at a certain distance from the wondrous crystal, and gazed intently upon it, while Dee took his place in a corner, ready to set down the prophecies as they were uttered by the spirits. In this manner they prophesied to the Pole that he should become the fortunate possessor of the philosopher’s stone; that he should live for centuries, and be chosen King of Poland, in which capacity he should gain many great victories over the Saracens, and make his name illustrious over all the earth. For this purpose it was necessary, however, that Laski should leave England, and take them with him,

together with their wives and families; that he should treat them all sumptuously, and allow them to want for nothing. Laski at once consented; and very shortly afterwards they were all on the road to Poland.

It took them upwards of four months to reach the count's estates in the neighbourhood of Cracow. In the mean time, they led a pleasant life, and spent money with an unsparing hand. When once established in the count's palace, they commenced the great hermetic operation of transmuting iron into gold. Laski provided them with all necessary materials, and aided them himself with his knowledge of alchemy; but, somehow or other, the experiment always failed at the very moment it ought to have succeeded, and they were obliged to recommence operations on a grander scale. But the hopes of Laski were not easily extinguished. Already, in idea, the possessor of countless millions, he was not to be cast down for fear of present expenses. He thus continued from day to day, and from month to month, till he was at last obliged to sell a portion of his deeply-mortgaged estates to find aliment for the hungry crucibles of Dee and Kelly, and the no less hungry stomachs of their wives and families. It was not till ruin stared him in the face that he awoke from his dream of infatuation, too happy, even then, to find that he had escaped utter beggary. Thus restored to his senses, his first thought was how to rid himself of his expensive visitors. Not wishing to quarrel with them, he proposed that they should proceed to Prague, well furnished with letters of recommendation to the Emperor Rudolph. Our alchemists too plainly saw that nothing more was to be made of the almost destitute Count Laski. Without hesitation, therefore, they accepted the proposal, and set out forthwith to the imperial residence. They

had no difficulty, on their arrival at Prague, in obtaining an audience of the emperor. They found him willing enough to believe that such a thing as the philosopher's stone existed, and flattered themselves that they had made a favourable impression upon him; but, from some cause or other—perhaps the look of low cunning and quackery upon the face of Kelly—the emperor conceived no very high opinion of their abilities. He allowed them, however, to remain for some months at Prague, feeding themselves upon the hope that he would employ them; but the more he saw of them, the less he liked them; and, when the pope's nuncio represented to him that he ought not to countenance such heretic magicians, he gave orders that they should quit his dominions within four-and-twenty hours. It was fortunate for them that so little time was given them; for, had they remained six hours longer, the nuncio had received orders to procure a perpetual dungeon or the stake for them.

Not knowing well whither to direct their steps, they resolved to return to Cracow, where they had still a few friends; but, by this time, the funds they had drawn from Laski were almost exhausted, and they were many days obliged to go dinnerless and supperless. They had great difficulty to keep their poverty a secret from the world; but they managed to bear privation without murmuring, from a conviction that if the fact were known, it would militate very much against their pretensions. Nobody would believe that they were possessors of the philosopher's stone, if it were once suspected that they did not know how to procure bread for their subsistence. They still gained a little by casting nativities, and kept starvation at arm's length, till a new dupe, rich enough for their purposes, dropped into their toils, in the shape of a royal personage. Having procured an

introduction to Stephen king of Poland, they predicted to him that the Emperor Rudolph would shortly be assassinated, and that the Germans would look to Poland for his successor. As this prediction was not precise enough to satisfy the king, they tried their crystal again, and a spirit appeared who told them that the new sovereign of Germany would be Stephen of Poland. Stephen was credulous enough to believe them, and was once present when Kelly held his mystic conversations with the shadows of his crystal. He also appears to have furnished them with money to carry on their experiments in alchemy; but he grew tired, at last, of their broken promises and their constant drains upon his pocket, and was on the point of discarding them with disgrace, when they met with another dupe, to whom they eagerly transferred their services. This was Count Rosenberg, a nobleman of large estates at Trebona in Bohemia. So comfortable did they find themselves in the palace of this munificent patron, that they remained nearly four years with him, faring sumptuously, and having an almost unlimited command of his money. The count was more ambitious than avaricious: he had wealth enough, and did not care for the philosopher's stone on account of the gold, but of the length of days it would bring him. They had their predictions, accordingly, all ready framed to suit his character. They prophesied that he should be chosen king of Poland; and promised, moreover, that he should live for five hundred years to enjoy his dignity, provided always that he found them sufficient money to carry on their experiments.

But now, while fortune smiled upon them, while they revelled in the rewards of successful villany, retributive justice came upon them in a shape they had not anticipated. Jealousy and mistrust sprang up

between the two confederates, and led to such violent and frequent quarrels, that Dee was in constant fear of exposure. Kelly imagined himself a much greater personage than Dee; measuring, most likely, by the standard of impudent roguery; and was displeased that on all occasions, and from all persons, Dee received the greater share of honour and consideration. He often threatened to leave Dee to shift for himself; and the latter, who had degenerated into the mere tool of his more daring associate, was distressed beyond measure at the prospect of his desertion. His mind was so deeply imbued with superstition, that he believed the rhapsodies of Kelly to be, in a great measure, derived from his intercourse with angels; and he knew not where, in the whole world, to look for a man of depth and wisdom enough to succeed him. As their quarrels every day became more and more frequent, Dee wrote letters to Queen Elizabeth to secure a favourable reception on his return to England, whither he intended to proceed if Kelly forsook him. He also sent her a round piece of silver, which he pretended he had made of a portion of brass cut out of a warming-pan. He afterwards sent her the warming-pan also, that she might convince herself that the piece of silver corresponded exactly with the hole which was cut into the brass. While thus preparing for the worst, his chief desire was to remain in Bohemia with Count Rosenberg, who treated him well, and reposed much confidence in him. Neither had Kelly any great objection to remain; but a new passion had taken possession of his breast, and he was laying deep schemes to gratify it. His own wife was ill-favoured and ill-natured; Dee's was comely and agreeable; and he longed to make an exchange of partners without exciting the jealousy or shocking the morality of Dee. This was a difficult matter; but to a man like Kelly,

who was as deficient in rectitude and right feeling as he was full of impudence and ingenuity, the difficulty was not insurmountable. He had also deeply studied the character and the foibles of Dee; and he took his measures accordingly. The next time they consulted the spirits, Kelly pretended to be shocked at their language, and refused to tell Dee what they had said. Dee insisted, and was informed that they were henceforth to have their wives in common. Dee, a little startled, inquired whether the spirits might not mean that they were to live in common harmony and good-will? Kelly tried again, with apparent reluctance, and said the spirits insisted upon the literal interpretation. The poor fanatic Dee resigned himself to their will; but it suited Kelly's purpose to appear coy a little longer. He declared that the spirits must be spirits not of good, but of evil; and refused to consult them any more. He thereupon took his departure, saying that he would never return.

Dee, thus left to himself, was in sore trouble and distress of mind. He knew not on whom to fix as the successor to Kelly for consulting the spirits; but at last chose his son Arthur, a boy of eight years of age. He consecrated him to this service with great ceremony, and impressed upon the child's mind the dignified and awful nature of the duties he was called upon to perform; but the poor boy had neither the imagination, the faith, nor the artifice of Kelly. He looked intently upon the crystal as he was told; but could see nothing and hear nothing. At last, when his eyes ached, he said he could see a vague indistinct shadow, but nothing more. Dee was in despair. The deception had been carried on so long, that he was never so happy as when he fancied he was holding converse with superior beings; and he cursed the day that had put estrangement between him and his

dear friend Kelly. This was exactly what Kelly had foreseen; and, when he thought the doctor had grieved sufficiently for his absence, he returned unexpectedly, and entered the room where the little Arthur was in vain endeavouring to distinguish something in the crystal. Dee, in entering this circumstance in his journal, ascribes this sudden return to a “miraculous fortune” and a “divine fate;” and goes on to record that Kelly immediately saw the spirits which had remained invisible to little Arthur. One of these spirits reiterated the previous command, that they should have their wives in common. Kelly bowed his head and submitted; and Dee, in all humility, consented to the arrangement.

This was the extreme depth of the wretched man’s degradation. In this manner they continued to live for three or four months, when, new quarrels breaking out, they separated once more. This time their separation was final. Kelly, taking the *elixir* which he had found in Glastonbury Abbey, proceeded to Prague, forgetful of the abrupt mode in which he had previously been expelled from that city. Almost immediately after his arrival, he was seized by order of the Emperor Rudolph, and thrown into prison. He was released after some months’ confinement, and continued for five years to lead a vagabond life in Germany, telling fortunes at one place, and pretending to make gold at another. He was a second time thrown into prison, on a charge of heresy and sorcery; and he then resolved, if ever he obtained his liberty, to return to England. He soon discovered that there was no prospect of this, and that his imprisonment was likely to be for life. He twisted his bed-clothes into a rope, one stormy night in February 1595, and let himself down from the window of his dungeon, situated at the top of a very high

tower. Being a corpulent man, the rope gave way, and he was precipitated to the ground. He broke two of his ribs and both his legs; and was otherwise so much injured, that he expired a few days afterwards.

Dee, for a while, had more prosperous fortune. The warming-pan he had sent to Queen Elizabeth was not without effect. He was rewarded soon after Kelly had left him with an invitation to return to England. His pride, which had been sorely humbled, sprang up again to its pristine dimensions, and he set out from Bohemia with a train of attendants becoming an ambassador. How he procured the money does not appear, unless from the liberality of the rich Bohemian Rosenberg, or perhaps from his plunder. He travelled with three coaches for himself and family, and three wagons to carry his baggage. Each coach had four horses, and the whole train was protected by a guard of four and twenty soldiers. This statement may be doubted; but it is on the authority of Dee himself, who made it on oath before the commissioners appointed by Elizabeth to inquire into his circumstances. On his arrival in England he had an audience of the queen, who received him kindly as far as words went, and gave orders that he should not be molested in his pursuits of chemistry and philosophy. A man who boasted of the power to turn baser metals into gold, could not, thought Elizabeth, be in want of money; and she therefore gave him no more substantial marks of her approbation than her countenance and protection.

Thrown thus unexpectedly upon his own resources, Dee began in earnest the search for the philosopher's stone. He worked incessantly among his furnaces, retorts, and crucibles, and almost poisoned himself with deleterious fumes. He also consulted his miraculous

crystal; but the spirits appeared not to him. He tried one Bartholomew to supply the place of the invaluable Kelly; but he being a man of some little probity, and of no imagination at all, the spirits would not hold any communication with him. Dee then tried another pretender to philosophy, of the name of Hickman, but had no better fortune. The crystal had lost its power since the departure of its great high priest. From this quarter, then, Dee could get no information on the stone or elixir of the alchemists, and all his efforts to discover them by other means were not only fruitless but expensive. He was soon reduced to great distress, and wrote piteous letters to the queen praying relief. He represented that, after he left England with Count Laski, the mob had pillaged his house at Mortlake, accusing him of being a necromancer and a wizard; and had broken all his furniture, burned his library, consisting of four thousand rare volumes, and destroyed all the philosophical instruments and curiosities in his museum. For this damage he claimed compensation; and furthermore stated, that, as he had come to England by the queen's command, she ought to pay the expenses of his journey. Elizabeth sent him small sums of money at various times; but Dee still continuing his complaints, a commission was appointed to inquire into his circumstances. He finally obtained a small appointment as Chancellor of St. Paul's cathedral, which he exchanged, in 1595, for the wardenship of the college at Manchester. He remained in this capacity till 1602 or 1603, when, his strength and intellect beginning to fail him, he was compelled to resign. He retired to his old dwelling at Mortlake, in a state not far removed from actual want, supporting himself as a common fortune-teller, and being often obliged to sell or pawn his books to procure a dinner. James I. was often applied to on

his behalf, but he refused to do any thing for him. It may be said to the discredit of this king, that the only reward he would grant the indefatigable Stowe, in his days of old age and want, was the royal permission to beg; but no one will blame him for neglecting such a quack as John Dee. He died in 1608, in the eighty-first year of his age, and was buried at Mortlake.

THE COSMOPOLITE.

Many disputes have arisen as to the real name of the alchemist who wrote several works under the above designation. The general opinion is that he was a Scotsman named Seton, and that by a fate very common to alchemists who boasted too loudly of their powers of transmutation, he ended his days miserably in a dungeon, into which he was thrown by a German potentate until he made a million of gold to pay his ransom. By some he has been confounded with Michael Sendivog, or Sendivogius, a Pole, a professor of the same art, who made a great noise in Europe at the commencement of the seventeenth century. Lenglet du Fresnoy, who is in general well informed with respect to the alchemists, inclines to the belief that these personages were distinct; and gives the following particulars of the Cosmopolite, extracted from George Morhoff, in his *Epistola ad Langelottum*, and other writers.

About the year 1600, one Jacob Haussen, a Dutch pilot, was shipwrecked on the coast of Scotland. A gentleman, named Alexander Seton, put off in a boat, and saved him from drowning, and afterwards entertained him hospitably for many weeks at his house on the shore. Haussen saw that he was addicted to the pursuits of chemistry, but no conversation on the subject passed between

them at the time. About a year and a half afterwards, Haussen being then at home at Enkhuysen, in Holland, received a visit from his former host. He endeavoured to repay the kindness that had been shewn him; and so great a friendship arose between them that Seton, on his departure, offered to make him acquainted with the great secret of the philosopher's stone. In his presence the Scotsman transmuted a great quantity of base metal into pure gold, and gave it him as a mark of his esteem. Seton then took leave of his friend, and travelled into Germany. At Dresden he made no secret of his wonderful powers, having, it is said, performed transmutation successfully before a great assemblage of the learned men of that city. The circumstance coming to the ears of the Duke or Elector of Saxony, he gave orders for the arrest of the alchymist. He caused him to be imprisoned in a high tower, and set a guard of forty men to watch that he did not escape, and that no strangers were admitted to his presence. The unfortunate Seton received several visits from the elector, who used every art of persuasion to make him divulge his secret. Seton obstinately refused either to communicate his secret, or to make any gold for the tyrant; on which he was stretched upon the rack, to see if the argument of torture would render him more tractable. The result was still the same; neither hope of reward nor fear of anguish could shake him. For several months he remained in prison, subjected alternately to a sedative and a violent regimen, till his health broke, and he wasted away almost to a skeleton.

There happened at that time to be in Dresden a learned Pole, named Michael Sendivogius, who had wasted a good deal of his time and substance in the unprofitable pursuits of alchymy. He was touched with pity for the hard fate, and admiration for the intrepidity

of Seton; and determined, if possible, to aid him in escaping from the clutch of his oppressor. He requested the elector's permission to see the alchymist, and obtained it with some difficulty. He found him in a state of great wretchedness, shut up from the light of day in a noisome dungeon, and with no better couch or fare than those allotted to the worst of criminals. Seton listened eagerly to the proposal of escape, and promised the generous Pole that he would make him richer than an eastern monarch if by his means he were liberated. Sendivogius immediately commenced operations; he sold some property which he possessed near Cracow, and with the proceeds led a merry life at Dresden. He gave the most elegant suppers, to which he regularly invited the officers of the guard, and especially those who did duty at the prison of the alchymist. He insinuated himself at last into their confidence, and obtained free ingress to his friend as often as he pleased; pretending that he was using his utmost endeavours to conquer his obstinacy and worm his secret out of him. When their project was ripe, a day was fixed upon for the grand attempt; and Sendivogius was ready with a post-chariot to convey him with all speed into Poland. By drugging some wine which he presented to the guards of the prison, he rendered them so drowsy that he easily found means to scale a wall unobserved, with Seton, and effect his escape. Seton's wife was in the chariot awaiting him, having safely in her possession a small packet of a black powder, which was, in fact, the philosopher's stone, or ingredient for the transmutation of iron and copper into gold. They all arrived in safety at Cracow; but the frame of Seton was so wasted by torture of body and starvation, to say nothing of the anguish of mind he had endured, that he did not long survive. He died in Cracow, in 1603 or

1604, and was buried under the cathedral church of that city. Such is the story related of the author of the various works which bear the name of the Cosmopolite. A list of them may be found in the third volume of the *History of the Hermetic Philosophy*.

SENDIVOGIUS.

On the death of Seton, Sendivogius married his widow, hoping to learn from her some of the secrets of her deceased lord in the art of transmutation. The ounce of black powder stood him, however, in better service; for the alchymists say, that by its means he converted great quantities of quicksilver into the purest gold. It is also said that he performed this experiment successfully before the Emperor Rudolph II., at Prague; and that the emperor, to commemorate the circumstance, caused a marble tablet to be affixed to the wall of the room in which it was performed, bearing this inscription, "Faciât hoc quispiam alius, quod fecit Sendivogius Polonus." M. Desnoyers, secretary to the Princess Mary of Gonzaga, Queen of Poland, writing from Warsaw in 1651, says that he saw this tablet, which existed at that time, and was often visited by the curious.

The after-life of Sendivogius is related in a Latin memoir of him by one Brodowski, his steward; and is inserted by Pierre Borel in his *Treasure of Gaulish Antiquities*. The Emperor Rudolph, according to this authority, was so well pleased with his success, that he made him one of his councillors of state, and invited him to fill a station in the royal household and inhabit the palace. But Sendivogius loved his liberty, and refused to become a courtier. He preferred to reside on his own patrimonial estate of Gravarna, where, for many years, he exercised a princely hospitality. His philosophic powder, which, his

steward says, was red, and not black, he kept in a little box of gold; and with one grain of it he could make five hundred ducats, or a thousand rix-dollars. He generally made his projection upon quicksilver. When he travelled, he gave this box to his steward, who hung it round his neck by a gold chain next his skin. But the greatest part of the powder he used to hide in a secret place cut into the step of his chariot. He thought that, if attacked at any time by robbers, they would not search such a place as that. When he anticipated any danger, he would dress himself in his valet's clothes, and, mounting the coach-box, put the valet inside. He was induced to take these precautions, because it was no secret that he possessed the philosopher's stone; and many unprincipled adventurers were on the watch for an opportunity to plunder him. A German prince, whose name Brodowski has not thought fit to chronicle, served him a scurvy trick, which ever afterwards put him on his guard. This prince went on his knees to Sendivogius, and entreated him in the most pressing terms to satisfy his curiosity, by converting some quicksilver into gold before him. Sendivogius, wearied by his importunity, consented, upon a promise of inviolable secrecy. After his departure, the prince called a German alchymist, named Muhlenfels, who resided in his house, and told him all that had been done. Muhlenfels entreated that he might have a dozen mounted horsemen at his command, that he might instantly ride after the philosopher, and either rob him of all his powder, or force from him the secret of making it. The prince desired nothing better; Muhlenfels, being provided with twelve men well mounted and armed, pursued Sendivogius in hot haste. He came up with him at a lonely inn by the road-side, just as he was sitting down to dinner. He at first endeavoured to persuade him to

divulge the secret; but finding this of no avail, he caused his accomplices to strip the unfortunate Sendivogius and tie him naked to one of the pillars of the house. He then took from him his golden box, containing a small quantity of the powder; a manuscript book on the philosopher's stone; a golden medal, with its chain, presented to him by the Emperor Rudolph; and a rich cap, ornamented with diamonds, of the value of one hundred thousand rix-dollars. With this booty he decamped, leaving Sendivogius still naked and firmly bound to the pillar. His servants had been treated in a similar manner; but the people of the inn released them all as soon as the robbers were out of sight.

Sendivogius proceeded to Prague, and made his complaint to the emperor. An express was instantly sent off to the prince, with orders that he should deliver up Muhlenfels and all his plunder. The prince, fearful of the emperor's wrath, caused three large gallows to be erected in his court-yard; on the highest of which he hanged Muhlenfels, with another thief on each side of him. He thus propitiated the emperor, and got rid of an ugly witness against himself. He sent back, at the same time, the bejewelled hat, the medal and chain, and the treatise upon the philosopher's stone, which had been stolen from Sendivogius. As regarded the powder, he said he had not seen it, and knew nothing about it.

This adventure made Sendivogius more prudent; he would no longer perform the process of transmutation before any strangers, however highly recommended. He pretended also to be very poor; and sometimes lay in bed for weeks together, that people might believe he was suffering from some dangerous malady, and could not therefore, by any possibility, be the owner of the philosopher's stone.

He would occasionally coin false money, and pass it off as gold; preferring to be esteemed a cheat rather than a successful alchemist.

Many other extraordinary tales are told of this personage by his steward Brodowski, but they are not worth repeating. He died in 1636, aged upwards of eighty, and was buried in his own chapel at Gravarna. Several works upon alchemy have been published under his name.

THE ROSICRUCIANS.

It was during the time of the last-mentioned author that the sect of the Rosicrucians first began to create a sensation in Europe. The influence which they exercised upon opinion during their brief career, and the permanent impression which they have left upon European literature, claim for them especial notice. Before their time, alchemy was but a grovelling delusion; and theirs is the merit of having spiritualised and refined it. They also enlarged its sphere, and supposed the possession of the philosopher's stone to be, not only the means of wealth, but of health and happiness, and the instrument by which man could command the services of superior beings, control the elements to his will, defy the obstructions of time and space, and acquire the most intimate knowledge of all the secrets of the universe. Wild and visionary as they were, they were not without their uses; if it were only for having purged the superstitions of Europe of the dark and disgusting forms with which the monks had peopled it, and substituted, in their stead, a race of mild, graceful, and beneficent beings.

They are said to have derived their name from Christian Rosencreutz, or "Rose-cross," a German philosopher, who travelled

in the Holy Land towards the close of the fourteenth century. While dangerously ill at a place called Damcar, he was visited by some learned Arabs, who claimed him as their brother in science, and unfolded to him, by inspiration, all the secrets of his past life, both of thought and of action. They restored him to health by means of the philosopher's stone, and afterwards instructed him in all their mysteries. He returned to Europe in 1401, being then only twenty-three years of age; and drew a chosen number of his friends around him, whom he initiated into the new science, and bound by solemn oaths to keep it secret for a century. He is said to have lived eighty-three years after this period, and to have died in 1484.

Many have denied the existence of such a personage as Rosencreutz, and have fixed the origin of this sect at a much later epoch. The first dawning of it, they say, is to be found in the theories of Paracelsus and the dreams of Dr. Dee, who, without intending it, became the actual, though never the recognised founders of the Rosicrucian philosophy. It is now difficult, and indeed impossible, to determine whether Dee and Paracelsus obtained their ideas from the then obscure and unknown Rosicrucians, or whether the Rosicrucians did but follow and improve upon them. Certain it is, that their existence was never suspected till the year 1605, when they began to excite attention in Germany. No sooner were their doctrines promulgated, than all the visionaries, Paracelsists, and alchemists, flocked around their standard, and vaunted Rosencreutz as the new regenerator of the human race. Michael Mayer, a celebrated physician of that day, and who had impaired his health and wasted his fortune in searching for the philosopher's stone, drew up a report of the tenets and ordinances of the new fraternity, which was

published at Cologne, in the year 1615. They asserted, in the first place, “that the meditations of their founders surpassed every thing that had ever been imagined since the creation of the world, without even excepting the revelations of the Deity; that they were destined to accomplish the general peace and regeneration of man before the end of the world arrived; that they possessed all wisdom and piety in a supreme degree; that they possessed all the graces of nature, and could distribute them among the rest of mankind according to their pleasure; that they were subject to neither hunger, nor thirst, nor disease, nor old age, nor to any other inconvenience of nature; that they knew by inspiration, and at the first glance, every one who was worthy to be admitted into their society; that they had the same knowledge then which they would have possessed if they had lived from the beginning of the world, and had been always acquiring it; that they had a volume in which they could read all that ever was or ever would be written in other books till the end of time; that they could force to, and retain in their service the most powerful spirits and demons; that, by the virtue of their songs, they could attract pearls and precious stones from the depths of the sea or the bowels of the earth; that God had covered them with a thick cloud, by means of which they could shelter themselves from the malignity of their enemies, and that they could thus render themselves invisible from all eyes; that the first eight brethren of the ‘Rose-cross’ had power to cure all maladies; that, by means of the fraternity, the triple diadem of the pope would be reduced into dust; that they only admitted two sacraments, with the ceremonies of the primitive Church, renewed by them; that they recognised the Fourth Monarchy and the Emperor of the Romans as their chief and the chief of all Christians; that they

would provide him with more gold, their treasures being inexhaustible, than the King of Spain had ever drawn from the golden regions of Eastern and Western Ind.” This was their confession of faith. Their rules of conduct were six in number, and as follow:

First. That, in their travels, they should gratuitously cure all diseases.

Secondly. That they should always dress in conformity to the fashion of the country in which they resided.

Thirdly. That they should, once every year, meet together in the place appointed by the fraternity, or send in writing an available excuse.

Fourthly. That every brother, whenever he felt inclined to die, should choose a person worthy to succeed him.

Fifthly. That the words “Rose-cross” should be the marks by which they should recognise each other.

Sixthly. That their fraternity should be kept secret for six times twenty years.

They asserted that these laws had been found inscribed in a golden book in the tomb of Rosencreutz, and that the six times twenty years from his death expired in 1604. They were consequently called upon from that time forth to promulgate their doctrine for the welfare of mankind⁴⁴.

For eight years these enthusiasts made converts in Germany, but they excited little or no attention in other parts of Europe. At last they made their appearance in Paris, and threw all the learned, all the credulous, and all the lovers of the marvellous into commotion. In the beginning of March 1623, the good folks of that city, when

they arose one morning, were surprised to find all their walls placarded with the following singular manifesto:

“We, the deputies of the principal College of the Brethren of the Rose-cross, have taken up our abode, visible and invisible, in this city, by the grace of the Most High, towards whom are turned the hearts of the just. We shew and teach without books or signs, and speak all sorts of languages in the countries where we dwell, to draw mankind, our fellows, from error and from death.”

For a long time this strange placard was the sole topic of conversation in all public places. Some few wondered, but the greater number only laughed at it. In the course of a few weeks two books were published, which raised the first alarm respecting this mysterious society, whose dwelling-place no one knew, and no members of which had ever been seen. The first was called a history of *The frightful Compacts entered into between the Devil and the pretended ‘Invisibles;’ with their damnable Instructions, the deplorable Ruin of their Disciples, and their miserable end.* The other was called an *Examination of the new and unknown Cabala of the Brethren of the Rose-cross, who have lately inhabited the City of Paris; with the History of their Manners, the Wonders worked by them, and many other particulars.*

These books sold rapidly. Every one was anxious to know something of this dreadful and secret brotherhood. The *badauds* of Paris were so alarmed that they daily expected to see the arch-enemy walking *in propria persona* among them. It was said in these volumes that the Rosicrucian society consisted of six-and-thirty

persons in all, who had renounced their baptism and hope of resurrection. That it was not by means of good angels, as they pretended, that they worked their prodigies; but that it was the devil who gave them power to transport themselves from one end of the world to the other with the rapidity of thought; to speak all languages; to have their purses always full of money, however much they might spend; to be invisible, and penetrate into the most secret places, in spite of fastenings of bolts and bars; and to be able to tell the past and future. These thirty-six brethren were divided into bands or companies: six of them only had been sent on the mission to Paris, six to Italy, six to Spain, six to Germany, four to Sweden, and two into Switzerland, two into Flanders, two into Lorraine, and two into Franche Comté. It was generally believed that the missionaries to France resided somewhere in the Marais du Temple. That quarter of Paris soon acquired a bad name, and people were afraid to take houses in it, lest they should be turned out by the six invisibles of the Rose-cross. It was believed by the populace, and by many others whose education should have taught them better, that persons of a mysterious aspect used to visit the inns and hotels of Paris, and eat of the best meats and drink of the best wines, and then suddenly melt away into thin air when the landlord came with the reckoning. That gentle maidens, who went to bed alone, often awoke in the night and found men in bed with them, of shape more beautiful than the Grecian Apollo, who immediately became invisible when an alarm was raised. It was also said that many persons found large heaps of gold in their houses without knowing from whence they came. All Paris was in alarm. No man thought himself secure of his goods, no maiden of her virginity, or wife of her chastity, while

these Rosicrucians were abroad. In the midst of the commotion, a second placard was issued to the following effect:

“If any one desires to see the brethren of the Rose-cross from curiosity only, he will never communicate with us. But if his will really induces him to inscribe his name in the register of our brotherhood, we, who can judge of the thoughts of all men, will convince him of the truth of our promises. For this reason we do not publish to the world the place of our abode. Thought alone, in unison with the sincere will of those who desire to know us, is sufficient to make us known to them, and them to us.”

Though the existence of such a society as that of the Rose-cross was problematical, it was quite evident that somebody or other was concerned in the promulgation of these placards, which were stuck up on every wall in Paris. The police endeavoured in vain to find out the offenders, and their want of success only served to increase the perplexity of the public. The Church very soon took up the question; and the Abbé Gaultier, a Jesuit, wrote a book to prove that, by their enmity to the pope, they could be no other than disciples of Luther, sent to promulgate his heresy. Their very name, he added, proved that they were heretics; a *cross* surmounted by a *rose* being the heraldic device of the arch-heretic Luther. One Garasse said they were a confraternity of drunken impostors; and that their name was derived from the garland of roses, in the form of a cross, hung over the tables of taverns in Germany as the emblem of secrecy, and from whence was derived the common saying, when one man communicated a secret to another, that it was said “under the rose.”

Others interpreted the letters F. R. C. to mean, not Brethren of the Rose-cross, but *Fratres Roris Cocti*, or Brothers of Boiled Dew; and explained this appellation by alleging that they collected large quantities of morning dew, and boiled it, in order to extract a very valuable ingredient in the composition of the philosopher's stone and the water of life.

The fraternity thus attacked defended themselves as well as they were able. They denied that they used magic of any kind, or that they consulted the devil. They said they were all happy; that they had lived more than a century, and expected to live many centuries more; and that the intimate knowledge which they possessed of all nature was communicated to them by God himself as a reward for their piety and utter devotion to his service. Those were in error who derived their name from a cross of roses, or called them drunkards. To set the world right on the first point, they reiterated that they derived their name from Christian Rosencreutz, their founder; and to answer the latter charge, they repeated that they knew not what thirst was, and had higher pleasures than those of the palate. They did not desire to meddle with the politics or religion of any man or set of men, although they could not help denying the supremacy of the pope, and looking upon him as a tyrant. Many slanders, they said, had been repeated respecting them, the most unjust of which was, that they indulged in carnal appetites, and, under the cloak of their invisibility, crept into the chambers of beautiful maidens. They asserted, on the contrary, that the first vow they took on entering the society was a vow of chastity, and that any one among them who transgressed in that particular would immediately lose all the advantages he enjoyed, and be exposed once more to hunger, woe,

disease, and death, like other men. So strongly did they feel on the subject of chastity, that they attributed the fall of Adam solely to his want of this virtue. Besides defending themselves in this manner, they entered into a further confession of their faith. They discarded for ever all the old tales of sorcery and witchcraft, and communion with the devil. They said there were no such horrid, unnatural, and disgusting beings as the incubi and succubi, and the innumerable grotesque imps that men had believed in for so many ages. Man was not surrounded with enemies like these, but with myriads of beautiful and beneficent beings, all anxious to do him service. The air was peopled with sylphs, the water with undines or naiads, the bowels of the earth with gnomes, and the fire with salamanders. All these beings were the friends of man, and desired nothing so much as that men should purge themselves of all uncleanness, and thus be enabled to see and converse with them. They possessed great power, and were unrestrained by the barriers of space or the obstructions of matter. But man was in one particular their superior. He had an immortal soul, and they had not. They might, however, become sharers in man's immortality if they could inspire one of that race with the passion of love towards them. Hence it was the constant endeavour of the female spirits to captivate the admiration of men, and of the male gnomes, sylphs, salamanders, and undines to be beloved by a woman. The object of this passion, in returning their love, imparted a portion of that celestial fire, the soul; and from that time forth the beloved became equal to the lover, and both, when their allotted course was run, entered together into the mansions of felicity. These spirits, they said, watched constantly over mankind by night and day. Dreams, omens, and presentiments were all their

works, and the means by which they gave warning of the approach of danger. But though so well inclined to befriend man for their own sakes, the want of a soul rendered them at times capricious and revengeful; they took offence on slight causes, and heaped injuries instead of benefits on the heads of those who extinguished the light of reason that was in them by gluttony, debauchery, and other appetites of the body.

The excitement produced in Paris by the placards of the brotherhood and the attacks of the clergy wore itself away after a few months. The stories circulated about them became at last too absurd even for that age of absurdity, and men began to laugh once more at those invisible gentlemen and their fantastic doctrines. Gabriel Naudé at that conjuncture brought out his *Avis à la France sur les Frères de la Rose-croix*, in which he very successfully exposed the folly of the new sect. This work, though not well written, was well timed. It quite extinguished the Rosicrucians of France; and after that year little more was heard of them. Swindlers in different parts of the country assumed the name at times to cloak their depredations; and now and then one of them was caught and hanged for his too great ingenuity in enticing pearls and precious stones from the pockets of other people into his own, or for passing off lumps of gilded brass for pure gold, made by the agency of the philosopher's stone. With these exceptions, oblivion shrouded them.

The doctrine was not confined to a sphere so narrow as France alone; it still nourished in Germany, and drew many converts in England. The latter countries produced two great masters in the persons of Jacob Böhmen and Robert Fludd—pretended philosophers, of whom it is difficult to say which was the more

absurd and extravagant. It would appear that the sect was divided into two classes—the brothers *Roseæ Crucis*, who devoted themselves to the wonders of this sublunary sphere, and the brothers *Aureæ Crucis*, who were wholly occupied in the contemplation of things divine. Fludd belonged to the first class, and Böhmen to the second. Fludd may be called the father of the English Rosicrucians, and as such merits a conspicuous niche in the temple of Folly.

He was born in the year 1574 at Milgate, in Kent, and was the son of Sir Thomas Fludd, Treasurer of War to Queen Elizabeth. He was originally intended for the army; but he was too fond of study, and of a disposition too quiet and retiring, to shine in that sphere. His father would not therefore press him to adopt a course of life for which he was unsuited, and encouraged him in the study of medicine, for which he early manifested a partiality. At the age of twenty-five he proceeded to the continent; and being fond of the abstruse, the marvellous, and the incomprehensible, he became an ardent disciple of the school of Paracelsus, whom he looked upon as the regenerator not only of medicine, but of philosophy. He remained six years in Italy, France, and Germany, storing his mind with fantastic notions, and seeking the society of enthusiasts and visionaries. On his return to England in 1605, he received the degree of Doctor of Medicine from the University of Oxford, and began to practise as a physician in London.

He soon made himself conspicuous. He latinised his name from Robert Fludd into Robertus à Fluctibus, and began the promulgation of many strange doctrines. He avowed his belief in the philosopher's stone, the water of life, and the universal alkahest; and maintained that there were but two principles of all things,—which were,

condensation, the boreal or northern virtue; and rarefaction, the southern or austral virtue. A number of demons, he said, ruled over the human frame, whom he arranged in their places in a rhomboid. Every disease had its peculiar demon who produced it, which demon could only be combated by the aid of the demon whose place was directly opposite to his in the rhomboidal figure. Of his medical notions we shall have further occasion to speak in another part of this book, when we consider him in his character as one of the first founders of the magnetic delusion, and its offshoot, animal magnetism, which has created so much sensation in our own day.

As if the doctrines already mentioned were not wild enough, he joined the Rosicrucians as soon as they began to make a sensation in Europe, and succeeded in raising himself to high consideration among them. The fraternity having been violently attacked by several German authors, and among others by Libavius, Fludd volunteered a reply, and published, in 1616, his defence of the Rosicrucian philosophy, under the title of the *Apologia compendiaria Fraternitatem de Rosea-cruce suspicionis et infamiæ maculis aspersam abluens*. This work immediately procured him great renown upon the Continent, and he was henceforth looked upon as one of the high-priests of the sect. Of so much importance was he considered, that Keppler and Gassendi thought it necessary to refute him; and the latter wrote a complete examination of his doctrine. Mersenne also, the friend of Descartes, and who had defended that philosopher when accused of having joined the Rosicrucians, attacked Dr. à Fluctibus, as he preferred to be called, and shewed the absurdity of the brothers of the Rose-cross in general, and of Dr. à Fluctibus in particular. Fluctibus wrote a long reply, in which he

called Mersenne an ignorant calumniator, and reiterated that alchemy was a profitable science, and the Rosicrucians worthy to be the regenerators of the world. This book was published at Frankfort, and was entitled *Summum Bonum, quod est Magiæ, Cabalæ, Alchimiæ, Fratrum, Roseæ-Crucis verorum, et adversus Mersenum Calumniatorem*. Besides this, he wrote several other works upon alchemy, a second answer to Libavius upon the Rosicrucians, and many medical works. He died in London in 1637.

After his time there was some diminution of the sect in England. They excited but little attention, and made no effort to bring themselves into notice. Occasionally some obscure and almost incomprehensible work made its appearance, to shew the world that the folly was not extinguished. Eugenius Philalethes, a noted alchemist, who has veiled his real name under this assumed one, translated *The Fame and Confession of the Brethren of the Rosie Cross*, which was published in London in 1652. A few years afterwards, another enthusiast, named John Heydon, wrote two works on the subject: the one entitled *The Wise Man's Crown, or the Glory of the Rosie Cross*; and the other, *The Holy Guide, leading the way to unite Art and Nature with the Rosie Crosse uncovered*. Neither of these attracted much notice. A third book was somewhat more successful; it was called *A new Method of Rosicrucian Physic; by John Heydon, the servant of God and the Secretary of Nature*. A few extracts will shew the ideas of the English Rosicrucians about this period. Its author was an attorney, "practising (to use his own words) at Westminster Hall all term times as long as he lived, and in the vacations devoting himself to alchymical and Rosicrucian meditation." In his preface, called by him an Apologue for an

Epilogue, he enlightens the public upon the true history and tenets of his sect. Moses, Elias, and Ezekiel were, he says, the most ancient masters of the Rosicrucian philosophy. Those few then existing in England and the rest of Europe, were as the eyes and ears of the great king of the universe, seeing and hearing all things; seraphically illuminated; companions of the holy company of unbodied souls and immortal angels; turning themselves, Proteus-like, into any shape, and having the power of working miracles. The most pious and abstracted brethren could slack the plague in cities, silence the violent winds and tempests, calm the rage of the sea and rivers, walk in the air, frustrate the malicious aspect of witches, cure all diseases, and turn all metals into gold. He had known in his time two famous brethren of the Rosie Cross, named Walfourd and Williams, who had worked miracles in his sight, and taught him many excellent predictions of astrology and earthquakes. “I desired one of these to tell me,” says he, “whether my complexion were capable of the society of my good genius. ‘When I see you again,’ said he (which was when he pleased to come to me, for I knew not where to go to him), ‘I will tell you.’ When I saw him afterwards, he said, ‘You should pray to God; for a good and holy man can offer no greater or more acceptable service to God than the oblation of himself—his soul.’ He said also, that the good genii were the benign eyes of God, running to and fro in the world, and with love and pity beholding the innocent endeavours of harmless and single-hearted men, ever ready to do them good and to help them.”

Heydon held devoutly true that dogma of the Rosicrucians which said that neither eating nor drinking was necessary to men. He maintained that any one might exist in the same manner as that

singular people dwelling near the source of the Ganges, of whom mention was made in the travels of his namesake, Sir Christopher Heydon, who had no mouths, and therefore could not eat, but lived by the breath of their nostrils; except when they took a far journey, and then they mended their diet with the smell of flowers. He said that in really pure air “there was a fine foreign fatness,” with which it was sprinkled by the sunbeams, and which was quite sufficient for the nourishment of the generality of mankind. Those who had enormous appetites, he had no objection to see take animal food, since they could not do without it; but he obstinately insisted that there was no necessity why they should *eat* it. If they put a plaster of nicely-cooked meat upon their epigastrium, it would be sufficient for the wants of the most robust and voracious! They would by that means let in no diseases, as they did at the broad and common gate, the mouth, as any one might see by example of drink; for all the while a man sat in water, he was never athirst. He had known, he said, many Rosicrucians, who by applying wine in this manner, had fasted for years together. In fact, quoth Heydon, we may easily fast all our life, though it be three hundred years, without any kind of meat, and so cut off all danger of disease.

This “sage philosopher” further informed his wondering contemporaries that the chiefs of the doctrine always carried about with them to their place of meeting their symbol, called the R. C. which was an ebony cross, flourished and decked with roses of gold; the cross typifying Christ’s sufferings upon the cross for our sins, and the roses of gold the glory and beauty of his Resurrection. This symbol was carried alternately to Mecca, Mount Calvary, Mount Sinai, Haran, and to three other places, which must have been in

mid-air, called *Cascle*, *Apamia* and *Chaulateau Virissa Caunuch*, where the Rosicrucian brethren met when they pleased, and made resolution of all their actions. They always took their pleasures in one of these places, where they resolved all questions of whatsoever had been done, was done, or should be done in the world, from the beginning to the end thereof. “And these,” he concludes, “are the men called Rosicrucians!”

Towards the end of the seventeenth century, more rational ideas took possession of the sect, which still continued to boast of a few members. They appear to have considered that contentment was the true philosopher’s stone, and to have abandoned the insane search for a mere phantom of the imagination. Addison, in *The Spectator*,⁴⁵ gives an account of his conversation with a Rosicrucian; from which it may be inferred that the sect had grown wiser in their deeds, though in their talk they were as foolish as ever. “I was once,” says he, “engaged in discourse with a Rosicrucian about the great secret. He talked of the secret as of a spirit which lived within an emerald, and converted every thing that was near it to the highest perfection that it was capable of. ‘It gives a lustre,’ says he, ‘to the sun, and water to the diamond. It irradiates every metal, and enriches lead with all the properties of gold. It heightens smoke into flame, flame into light, and light into glory.’ He further added, ‘that a single ray of it dissipates pain and care and melancholy from the person on whom it falls. In short,’ says he, ‘its presence naturally changes every place into a kind of heaven.’ After he had gone on for some time in this unintelligible cant, I found that he jumbled natural and moral ideas together into the same discourse, and that his great secret was nothing else but content.”

JACOB BÖHMEN.

It is now time to speak of Jacob Böhmen, who thought he could discover the secret of the transmutation of metals in the Bible, and who invented a strange heterogeneous doctrine of mingled alchymy and religion, and founded upon it the sect of the Aurea-crucians. He was born at Görlitz, in Upper Lusatia, in 1575, and followed till his thirtieth year the occupation of a shoemaker. In this obscurity he remained, with the character of a visionary and a man of unsettled mind, until the promulgation of the Rosicrucian philosophy in his part of Germany, toward the year 1607 or 1608. From that time he began to neglect his leather, and buried his brain under the rubbish of metaphysics. The works of Paracelsus fell into his hands; and these, with the reveries of the Rosicrucians, so completely engrossed his attention, that he abandoned his trade altogether, sinking, at the same time, from a state of comparative independence into poverty and destitution. But he was nothing daunted by the miseries and privations of the flesh; his mind was fixed upon the beings of another sphere, and in thought he was already the new apostle of the human race. In the year 1612, after a meditation of four years, he published his first work, entitled *Aurora, or the Rising of the Sun*; embodying the ridiculous notions of Paracelsus, and worse confounding the confusion of that writer. The philosopher's stone might, he contended, be discovered by a diligent search of the Old and New Testaments, and more especially of the Apocalypse, which alone contained all the secrets of alchymy. He contended that the divine grace operated by the same rules, and followed the same methods, that the divine providence observed in the natural world; and that the minds of men were purged from their vices and corruptions in

the very same manner that metals were purified from their dross, namely, by fire.

Besides the sylphs, gnomes, undines, and salamanders, he acknowledged various ranks and orders of demons. He pretended to invisibility and absolute chastity. He also said that, if it pleased him, he could abstain for years from meat and drink, and all the necessities of the body. It is needless, however, to pursue his follies any further. He was reprimanded for writing this work by the magistrates of Görlitz, and commanded to leave the pen alone and stick to his wax, that his family might not become chargeable to the parish. He neglected this good advice, and continued his studies; burning minerals and purifying metals one day, and mystifying the Word of God on the next. He afterwards wrote three other works, as sublimely ridiculous as the first. The one was entitled *Metallurgia*, and has the slight merit of being the least obscure of his compositions. Another was called *The Temporal Mirror of Eternity*; and the last his *Theosophy revealed*, full of allegories and metaphors,

“All strange and geason,
Devoid of sense and ordinary reason.”

Böhmen died in 1624, leaving behind him a considerable number of admiring disciples. Many of them became, during the seventeenth century, as distinguished for absurdity as their master; amongst whom may be mentioned Gifftheil, Wendenhagen, John Jacob Zimmermann, and Abraham Frankenberg. Their heresy rendered them obnoxious to the Church of Rome; and many of them suffered long imprisonment and torture for their faith. One, named Kuhlmann, was burned alive at Moscow, in 1684, on a charge of sorcery. Böhmen's works were translated into English, and published, many years afterwards, by an enthusiast named William Law.

MORMIUS.

Peter Mormius, a notorious alchymist and contemporary of Böhmen, endeavoured, in 1630, to introduce the Rosicrucian philosophy into Holland. He applied to the States-General to grant him a public audience, that he might explain the tenets of the sect, and disclose a plan for rendering Holland the happiest and richest country on the earth, by means of the philosopher's stone and the service of the elementary spirits. The States-General wisely resolved

to have nothing to do with him. He thereupon determined to shame them by printing his book, which he did at Leyden the same year. It was entitled *The Book of the most Hidden Secrets of Nature*, and was divided into three parts; the first treating of “perpetual motion;” the second of the “transmutation of metals;” and the third of the “universal medicine.” He also published some German works upon the Rosicrucian philosophy, at Frankfort, in 1617.

Poetry and romance are deeply indebted to the Rosicrucians for many a graceful creation. The literature of England, France, and Germany contains hundreds of sweet fictions, whose machinery has been borrowed from their day-dreams. The “delicate Ariel” of Shakspeare stands pre-eminent among the number. From the same source Pope drew the airy tenants of Belinda’s dressing-room, in his charming *Rape of the Lock*; and La Motte Fouqué, the beautiful and capricious water-nymph Undine, around whom he has thrown more grace and loveliness, and for whose imaginary woes he has excited more sympathy, than ever were bestowed on a supernatural being. Sir Walter Scott also endowed the White Lady of Avenel with many of the attributes of the undines or water-sprites. German romance and lyrical poetry teem with allusions to sylphs, gnomes, undines, and salamanders; and the French have not been behind in substituting them, in works of fiction, for the more cumbrous mythology of Greece and Rome. The sylphs, more especially, have been the favourites of the bards, and have become so familiar to the popular mind as to be, in a manner, confounded with that other race of ideal beings, the fairies, who can boast of an antiquity much more venerable in the annals of superstition. Having these obligations to

the Rosicrucians, no lover of poetry can wish, however absurd they were, that such a sect of philosophers had never existed.

BORRI.

Just at the time that Michael Mayer was making known to the world the existence of such a body as the Rosicrucians, there was born in Italy a man who was afterwards destined to become the most conspicuous member of the fraternity. The alchymic mania never called forth the ingenuity of a more consummate or more successful impostor than Joseph Francis Borri. He was born in 1616, according to some authorities, and in 1627 according to others, at Milan; where his father, the Signor Branda Borri, practised as a physician. At the age of sixteen Joseph was sent to finish his education at the Jesuits' college in Rome, where he distinguished himself by his extraordinary memory. He learned every thing to which he applied himself with the utmost ease. In the most voluminous works no fact was too minute for his retention, and no study was so abstruse but that he could master it; but any advantages he might have derived from this facility were neutralised by his ungovernable passions and his love of turmoil and debauchery. He was involved in continual difficulty, as well with the heads of the college as with the police of Rome, and acquired so bad a character that years could not remove it. By the aid of his friends he established himself as a physician in Rome, and also obtained some situation in the pope's household. In one of his fits of studiousness he grew enamoured of alchymy, and determined to devote his energies to the discovery of the philosopher's stone. Of unfortunate propensities he had quite sufficient, besides this, to bring him to poverty. His pleasures were as expensive as his studies,

and both were of a nature to destroy his health and ruin his fair fame. At the age of thirty-seven he found that he could not live by the practice of medicine, and began to look about for some other employment. He became, in 1653, private secretary to the Marquis di Mirogli, the minister of the Archduke of Innsprück at the court of Rome. He continued in this capacity for two years; leading, however, the same abandoned life as heretofore, frequenting the society of gamblers, debauchees, and loose women, involving himself in disgraceful street quarrels, and alienating the patrons who were desirous to befriend him.

All at once a sudden change was observed in his conduct. The abandoned rake put on the outward sedateness of a philosopher; the scoffing sinner proclaimed that he had forsaken his evil ways, and would live thenceforth a model of virtue. To his friends this reformation was as pleasing as it was unexpected; and Borri gave obscure hints that it had been brought about by some miraculous manifestation of a superior power. He pretended that he held converse with beneficent spirits; that the secrets of God and nature were revealed to him; and that he had obtained possession of the philosopher's stone. Like his predecessor, Jacob Böhmen, he mixed up religious questions with his philosophical jargon, and took measures for declaring himself the founder of a new sect. This, at Rome itself, and in the very palace of the pope, was a hazardous proceeding; and Borri just awoke to a sense of it in time to save himself from the dungeons of the Castle of St. Angelo. He fled to Innsprück, where he remained about a year, and then returned to his native city of Milan.



INNSPRUCK.

The reputation of his great sanctity had gone before him; and he found many persons ready to attach themselves to his fortunes. All who were desirous of entering into the new communion took an oath of poverty, and relinquished their possessions for the general good of the fraternity. Borri told them that he had received from the archangel Michael a heavenly sword, upon the hilt of which were engraven the names of the seven celestial intelligences. “Whoever shall refuse,” said he, “to enter into my new sheepfold shall be destroyed by the papal armies, of whom God has predestined me to be the chief. To those who follow me all joy shall be granted. I shall soon bring my chemical studies to a happy conclusion, by the discovery of the philosopher’s stone, and by this means we shall all have as much gold as we desire. I am assured of the aid of the angelic

hosts, and more especially of the archangel Michael's. When I began to walk in the way of the spirit, I had a vision of the night, and was assured by an angelic voice that I should become a prophet. In sign of it I saw a palm-tree, surrounded with all the glory of paradise. The angels come to me whenever I call, and reveal to me all the secrets of the universe. The sylphs and elementary spirits obey me, and fly to the uttermost ends of the world to serve me, and those whom I delight to honour." By force of continually repeating such stories as these, Borri soon found himself at the head of a very considerable number of adherents. As he figures in these pages as an alchymist, and not as a religious sectarian, it will be unnecessary to repeat the doctrines which he taught with regard to some of the dogmas of the Church of Rome, and which exposed him to the fierce resentment of the papal authority. They were to the full as ridiculous as his philosophical pretensions. As the number of his followers increased, he appears to have cherished the idea of becoming one day a new Mahomet, and of founding, in his native city of Milan, a monarchy and religion of which he should be the king and the prophet. He had taken measures, in the year 1658, for seizing the guards at all the gates of that city, and formally declaring himself the monarch of the Milanese. Just as he thought the plan ripe for execution, it was discovered. Twenty of his followers were arrested, and he himself managed, with the utmost difficulty, to escape to the neutral territory of Switzerland, where the papal displeasure could not reach him.

The trial of his followers commenced forthwith, and the whole of them were sentenced to various terms of imprisonment. Borri's trial proceeded in his absence, and lasted for upwards of two years. He

was condemned to death as a heretic and sorcerer in 1661, and was burned in effigy in Rome by the common hangman.

Borri, in the mean time, lived quietly in Switzerland, indulging himself in railing at the Inquisition and its proceedings. He afterwards went to Strasbourg, intending to fix his residence in that town. He was received with great cordiality, as a man persecuted for his religious opinions, and withal a great alchemist. He found that sphere too narrow for his aspiring genius, and retired in the same year to the more wealthy city of Amsterdam. He there hired a magnificent house, established an equipage which eclipsed in brilliancy those of the richest merchants, and assumed the title of Excellency. Where he got the money to live in this expensive style was long a secret: the adepts in alchymy easily explained it, after their fashion. Sensible people were of opinion that he had come by it in a less wonderful manner; for it was remembered that among his unfortunate disciples in Milan, there were many rich men, who, in conformity with one of the fundamental rules of the sect, had given up all their earthly wealth into the hands of their founder. In whatever manner the money was obtained, Borri spent it in Holland with an unsparing hand, and was looked up to by the people with no little respect and veneration. He performed several able cures, and increased his reputation so much that he was vaunted as a prodigy. He continued diligently the operations of alchymy, and was in daily expectation that he should succeed in turning the inferior metals into gold. This hope never abandoned him, even in the worst extremity of his fortunes; and in his prosperity it led him into the most foolish expenses: but he could not long continue to live so magnificently upon the funds he had brought from Italy; and the philosopher's

stone, though it promised all for the wants of the morrow, never brought any thing for the necessities of to-day. He was obliged in a few months to retrench, by giving up his large house, his gilded coach and valuable blood-horses, his liveried domestics, and his luxurious entertainments. With this diminution of splendour came a diminution of renown. His cures did not appear so miraculous, when he went out on foot to perform them, as they had seemed when “his Excellency” had driven to a poor man’s door in his carriage with six horses. He sank from a prodigy into an ordinary man. His great friends shewed him the cold shoulder, and his humble flatterers carried their incense to some other shrine. Borri now thought it high time to change his quarters. With this view he borrowed money wherever he could get it, and succeeded in obtaining two hundred thousand florins from a merchant named De Meer, to aid, as he said, in discovering the water of life. He also obtained six diamonds of great value, on pretence that he could remove the flaws from them without diminishing their weight. With this booty he stole away secretly by night, and proceeded to Hamburgh.

On his arrival in that city, he found the celebrated Christina, the ex-queen of Sweden. He procured an introduction to her, and requested her patronage in his endeavour to discover the philosopher’s stone. She gave him some encouragement; but Borri, fearing that the merchants of Amsterdam, who had connexions in Hamburgh, might expose his delinquencies if he remained in the latter city, passed over to Copenhagen, and sought the protection of Frederick III., the king of Denmark.

This prince was a firm believer in the transmutation of metals. Being in want of money, he readily listened to the plans of an

adventurer who had both eloquence and ability to recommend him. He provided Borri with the means to make experiments, and took a great interest in the progress of his operations. He expected every month to possess riches that would buy Peru; and, when he was disappointed, accepted patiently the excuses of Borri, who, upon every failure, was always ready with some plausible explanation. He became in time much attached to him; and defended him from the jealous attacks of his courtiers, and the indignation of those who were grieved to see their monarch the easy dupe of a charlatan. Borri endeavoured, by every means in his power, to find aliment for this good opinion. His knowledge of medicine was useful to him in this respect, and often stood between him and disgrace. He lived six years in this manner at the court of Frederick; but that monarch dying in 1670 he was left without a protector.

As he had made more enemies than friends in Copenhagen, and had nothing to hope from the succeeding sovereign, he sought an asylum in another country. He went first to Saxony; but met so little encouragement, and encountered so much danger from the emissaries of the Inquisition, that he did not remain there many months. Anticipating nothing but persecution in every country that acknowledged the spiritual authority of the pope, he appears to have taken the resolution to dwell in Turkey, and turn Mussulman. On his arrival at the Hungarian frontier, on his way to Constantinople, he was arrested on suspicion of being concerned in the conspiracy of the Counts Nadasdi and Frangipani, which had just been discovered. In vain he protested his innocence, and divulged his real name and profession. He was detained in prison, and a letter despatched to the Emperor Leopold, to know what should be done with him. The star

of his fortunes was on the decline. The letter reached Leopold at an unlucky moment. The pope's nuncio was closeted with his majesty; and he no sooner heard the name of Joseph Francis Borri, than he demanded him as a prisoner of the Holy See. The request was complied with; and Borri, closely manacled, was sent under an escort of soldiers to the prison of the Inquisition at Rome. He was too much of an impostor to be deeply tinged with fanaticism, and was not unwilling to make a public recantation of his heresies, if he could thereby save his life. When the proposition was made to him, he accepted it with eagerness. His punishment was to be commuted into the hardly less severe one of perpetual imprisonment; but he was too happy to escape the clutch of the executioner at any price, and he made the *amende honorable* in face of the assembled multitudes of Rome on the 27th of October 1672. He was then transferred to the prisons of the Castle of St. Angelo, where he remained till his death, twenty-three years afterwards. It is said that, towards the close of his life, considerable indulgence was granted him; that he was allowed to have a laboratory, and to cheer the solitude of his dungeon by searching for the philosopher's stone. Queen Christina, during her residence at Rome, frequently visited the old man, to converse with him upon chemistry and the doctrines of the Rosicrucians. She even obtained permission that he should leave his prison occasionally for a day or two, and reside in her palace, she being responsible for his return to captivity. She encouraged him to search for the great secret of the alchemists, and provided him with money for the purpose. It may well be supposed that Borri benefited most by this acquaintance, and that Christina got nothing but experience. It is not sure that she gained even that; for until her dying day she was

convinced of the possibility of finding the philosopher's stone, and ready to assist any adventurer either zealous or impudent enough to pretend to it.

After Borri had been about eleven years in confinement, a small volume was published at Cologne, entitled *The Key of the Cabinet of the Chevalier Joseph Francis Borri, in which are contained many curious Letters upon Chemistry and other Sciences, written by him, together with a Memoir of his Life*. This book contained a complete exposition of the Rosicrucian philosophy, and afforded materials to the Abbé de Villars for his interesting *Count de Gabalis*, which excited so much attention at the close of the seventeenth century.

Borri lingered in the prison of St. Angelo till 1695, when he died, in his eightieth year. Besides *The Key of the Cabinet*, written originally in Copenhagen, in 1666, for the edification of King Frederick III., he published a work upon alchemy and the secret sciences, under the title of *The Mission of Romulus to the Romans*.

INFERIOR ALCHEMISTS OF THE SEVENTEENTH CENTURY.

Besides the pretenders to the philosopher's stone whose lives have been already narrated, this and the preceding century produced a great number of writers, who inundated literature with their books upon the subject. In fact, most of the learned men of that age had some faith in it. Van Helmont, Borrichius, Kircher, Boerhaave, and a score of others, though not professed alchemists, were fond of the science, and countenanced its professors. Helvetius, the grandfather of the celebrated philosopher of the same name, asserts that he saw an inferior metal turned into gold by a stranger, at the Hague, in 1666. He says, that, sitting one day in his study, a man, who was

dressed as a respectable burgher of North Holland, and very modest and simple in his appearance, called upon him, with the intention of dispelling his doubts relative to the philosopher's stone. He asked Helvetius if he thought he should know that rare gem if he saw it. To which Helvetius replied, that he certainly should not. The burgher immediately drew from his pocket a small ivory box, containing three pieces of metal, of the colour of brimstone, and extremely heavy; and assured Helvetius, that of them he could make as much as twenty tons of gold. Helvetius informs us, that he examined them very attentively; and seeing that they were very brittle, he took the opportunity to scrape off a small portion with his thumb-nail. He then returned them to the stranger, with an entreaty that he would perform the process of transmutation before him. The stranger replied, that he was not allowed to do so, and went away. After his departure, Helvetius procured a crucible and a portion of lead, into which, when in a state of fusion, he threw the stolen grain from the philosopher's stone. He was disappointed to find that the grain evaporated altogether, leaving the lead in its original state.

Some weeks afterwards, when he had almost forgotten the subject, he received another visit from the stranger. He again entreated him to explain the processes by which he pretended to transmute lead. The stranger at last consented, and informed him, that one grain was sufficient; but that it was necessary to envelope it in a ball of wax before throwing it on the molten metal; otherwise its extreme volatility would cause it to go off in vapour. They tried the experiment, and succeeded to their heart's content. Helvetius repeated the experiment alone, and converted six ounces of lead into very pure gold.

The fame of this event spread all over the Hague, and all the notable persons of the town flocked to the study of Helvetius to convince themselves of the fact. Helvetius performed the experiment again, in the presence of the Prince of Orange, and several times afterwards, until he exhausted the whole of the powder he had received from the stranger, from whom it is necessary to state, he never received another visit; nor did he ever discover his name or condition. In the following year, Helvetius published his *Golden Calf*,⁴⁶ in which he detailed the above circumstances.

About the same time, the celebrated Father Kircher published his *Subterranean World*, in which he called the alchemists a congregation of knaves and impostors, and their science a delusion. He admitted that he had himself been a diligent labourer in the field, and had only come to this conclusion after mature consideration and repeated fruitless experiments. All the alchemists were in arms immediately, to refute this formidable antagonist. One Solomon de Blauenstein was the first to grapple with him, and attempted to convict him of wilful misrepresentation, by recalling to his memory the transmutations by Sendivogius, before the Emperor Frederick III. and the Elector of Mayence, all performed within a recent period. Zwelfer and Glauber also entered into the dispute, and attributed the enmity of Father Kircher to spite and jealousy against adepts who had been more successful than himself.

It was also pretended that Gustavus Adolphus transmuted a quantity of quicksilver into pure gold. The learned Borrichius relates, that he saw coins which had been struck of this gold; and Lenglet du Fresnoy deposes to the same circumstance. In the *Travels of Monconis* the story is told in the following manner: “A merchant of

Lubeck, who carried on but little trade, but who knew how to change lead into very good gold, gave the King of Sweden a lingot which he had made, weighing at least one hundred pounds. The king immediately caused it to be coined into ducats; and because he knew positively that its origin was such as had been stated to him, he had his own arms graven upon the one side, and emblematical figures of Mercury and Venus on the other. I (continued Monconis) have one of these ducats in my possession; and was credibly informed that, after the death of the Lubeck merchant, who had never appeared very rich, a sum of no less than one million seven hundred thousand crowns was found in his coffers.”⁴⁷

Such stories as these, confidently related by men high in station, tended to keep up the infatuation of the alchymists in every country of Europe. It is astonishing to see the number of works which were written upon the subject during the seventeenth century alone, and the number of clever men who sacrificed themselves to the delusion. Gabriel de Castaigne, a monk of the order of St. Francis, attracted so much notice in the reign of Louis XIII., that that monarch secured him in his household, and made him his Grand Almoner. He pretended to find the elixir of life, and Louis expected by his means to have enjoyed the crown for a century. Van Helmont also pretended to have once performed with success the process of transmuting quicksilver, and was in consequence invited by the Emperor Rudolph II. to fix his residence at the court of Vienna. Glauber, the inventor of the salts which still bear his name, and who practised as a physician at Amsterdam about the middle of the seventeenth century, established a public school in that city for the study of alchymy, and gave lectures himself upon the science. John

Joachim Becher of Spire acquired great reputation at the same period, and was convinced that much gold might be made out of flint-stones by a peculiar process, and the aid of that grand and incomprehensible substance the philosopher's stone. He made a proposition to the Emperor Leopold of Austria to aid him in these experiments; but the hope of success was too remote, and the present expense too great, to tempt that monarch, and he therefore gave Becher much of his praise, but none of his money. Becher afterwards tried the States-General of Holland with no better success.

With regard to the innumerable tricks by which impostors persuaded the world that they had succeeded in making gold, and of which so many stories were current about this period, a very satisfactory report was read by M. Geoffroy the elder, at the sitting of the Royal Academy of Sciences at Paris, on the 15th of April, 1722. As it relates principally to the alchymic cheats of the sixteenth and seventeenth centuries, the following abridgment of it may not be out of place in this portion of our history. The instances of successful transmutation were so numerous, and apparently so well authenticated, that nothing short of so able an exposure as that of M. Geoffroy could disabuse the public mind. The trick to which they oftenest had recourse was to use a double-bottomed crucible, the under surface being of iron or copper, and the upper one of wax, painted to resemble the same metal. Between the two they placed as much gold or silver dust as was necessary for their purpose. They then put in their lead, quicksilver, or other ingredients, and placed their pot upon the fire. Of course, when the experiment was concluded, they never failed to find a lump of gold at the bottom. The

same result was produced in many other ways. Some of them used a hollow wand, filled with gold or silver dust, and stopped at the ends with wax or butter. With this they stirred the boiling metal in their crucibles, taking care to accompany the operation with many ceremonies, to divert attention from the real purpose of the manœuvre. They also drilled holes in lumps of lead, into which they poured molten gold, and carefully closed the aperture with the original metal. Sometimes they washed a piece of gold with quicksilver. When in this state, they found no difficulty in palming it off upon the uninitiated as an inferior metal, and very easily transmuted it into fine sonorous gold again with the aid of a little aquafortis.

Others imposed by means of nails, half iron and half gold or silver. They pretended that they really transmuted the precious half from iron, by dipping it in a strong alcohol. M. Geoffroy produced several of these nails to the Academy of Sciences, and shewed how nicely the two parts were soldered together. The golden or silver half was painted black to resemble iron, and the colour immediately disappeared when the nail was dipped into aquafortis. A nail of this description was, for a long time, in the cabinet of the Grand Duke of Tuscany. Such also, said M. Geoffroy, was the knife presented by a monk to Queen Elizabeth of England; the blade of which was half gold and half steel. Nothing at one time was more common than to see coins, half gold and half silver, which had been operated upon by alchemists, for the same purposes of trickery. In fact, says M. Geoffroy, in concluding his long report, there is every reason to believe that all the famous histories which have been handed down to us about the transmutation of metals into gold or silver, by means of

the powder of projection or philosophical elixirs, are founded upon some successful deception of the kind above narrated. These pretended philosophers invariably disappeared after the first or second experiment, or their powders or elixirs have failed to produce their effect, either because attention being excited they have found no opportunity to renew the trick without being discovered, or because they have not had sufficient gold dust for more than one trial.

The disinterestedness of these would-be philosophers looked, at first sight, extremely imposing. Instances were not rare in which they generously abandoned all the profits of their transmutations—even the honour of the discovery. But this apparent disinterestedness was one of the most cunning of their manœuvres. It served to keep up the popular expectation; it seemed to shew the possibility of discovering the philosopher's stone, and provided the means of future advantages, which they were never slow to lay hold of—such as entrances into royal households, maintenance at the public expense, and gifts from ambitious potentates, too greedy after the gold they so easily promised.

It now only remains to trace the progress of the delusion from the commencement of the eighteenth century until the present day. It will be seen that, until a very recent period, there were but slight signs of a return to reason.

JEAN DELISLE.

In the year 1705, there was much talk in France of a blacksmith, named Delisle, who had discovered the philosopher's stone, and who went about the country turning lead into gold. He was a native of

Provence, from which place his fame soon spread to the capital. His early life is involved in obscurity; but Lenglet du Fresnoy has industriously collected some particulars of his later career, which possess considerable interest. He was a man without any education, and had been servant in his youth to an alchymist, from whom he learned many of the tricks of the fraternity. The name of his master has never been discovered; but it is pretended that he rendered himself in some manner obnoxious to the government of Louis XIV., and was obliged, in consequence, to take refuge in Switzerland. Delisle accompanied him as far as Savoy, and there, it is said, set upon him in a solitary mountain-pass, and murdered and robbed him. He then disguised himself as a pilgrim, and returned to France. At a lonely inn, by the road-side, where he stopped for the night, he became acquainted with a woman, named Aluys; and so sudden a passion was enkindled betwixt them, that she consented to leave all, follow him, and share his good or evil fortune wherever he went. They lived together for five or six years in Provence, without exciting any attention, apparently possessed of a decent independence. At last, in 1706, it was given out that he was the possessor of the philosopher's stone; and people from far and near came flocking to his residence, at the Château de la Palu, at Sylanez, near Barjaumont, to witness the wealth he could make out of pumps and fire-shovels. The following account of his operations is given in a letter addressed by M. de Cerisy, the Prior of Châteauneuf, in the Diocese of Riez, in Provence, to the Vicar of St. Jacques du Hautpas, at Paris, and dated the 18th of November, 1706:

“I have something to relate to you, my dear cousin, which will be interesting to you and your friends. The philosopher's stone,

which so many persons have looked upon as a chimera, is at last found. It is a man named Delisle, of the parish of Sylanez, and residing within a quarter of a league of me, that has discovered this great secret. He turns lead into gold, and iron into silver, by merely heating these metals red hot, and pouring upon them in that state some oil and powder he is possessed of; so that it would not be impossible for any man to make a million a day, if he had sufficient of this wondrous mixture. Some of the pale gold which he had made in this manner, he sent to the jewellers of Lyons, to have their opinion on its quality. He also sold twenty pounds weight of it to a merchant of Digne, named Taxis. All the jewellers say they never saw such fine gold in their lives. He makes nails, part gold, part iron, and part silver. He promised to give me one of them, in a long conversation which I had with him the other day, by order of the Bishop of Senés, who saw his operations with his own eyes, and detailed all the circumstances to me.

“The Baron and Baroness de Rheinwald shewed me a lingot of gold made out of pewter before their eyes by M. Delisle. My brother-in-law Sauveur, who has wasted fifty years of his life in this great study, brought me the other day a nail which he had seen changed into gold by Delisle, and fully convinced me that all his previous experiments were founded on an erroneous principle. This excellent workman received, a short time ago, a very kind letter from the superintendent of the royal household, which I read. He offered to use all his influence with the ministers to prevent any attempts upon his liberty, which has twice been attacked by the agents of government. It is believed

that the oil he makes use of, is gold or silver reduced to that state. He leaves it for a long time exposed to the rays of the sun. He told me that it generally took him six months to make all his preparations. I told him that, apparently, the king wanted to see him. He replied that he could not exercise his art in every place, as a certain climate and temperature were absolutely necessary to his success. The truth is, that this man appears to have no ambition. He only keeps two horses and two men-servants. Besides, he loves his liberty, has no politeness, and speaks very bad French; but his judgment seems to be solid. He was formerly no more than a blacksmith, but excelled in that trade without having been taught it. All the great lords and seigneurs from far and near come to visit him, and pay such court to him, that it seems more like idolatry than any thing else. Happy would France be if this man would discover his secret to the king, to whom the superintendent has already sent some lingots! But the happiness is too great to be hoped for; for I fear that the workman and his secret will expire together. There is no doubt that this discovery will make a great noise in the kingdom, unless the character of the man, which I have just depicted to you, prevent it. At all events, posterity will hear of him.”

In another letter to the same person, dated the 27th of January 1707, M. de Cerisy says, “My dear cousin, I spoke to you in my last letter of the famous alchymist of Provence, M. Delisle. A good deal of that was only hearsay, but now I am enabled to speak from my own experience. I have in my possession a nail, half iron and half silver, which I made myself. That great and admirable workman also bestowed a still greater privilege upon me—he allowed me turn a

piece of lead which I had brought with me into pure gold, by means of his wonderful oil and powder. All the country have their eyes upon this gentleman; some deny loudly, others are incredulous; but those who have seen acknowledge the truth. I have read the passport that has been sent to him from court, with orders that he should present himself at Paris early in the spring. He told me that he would go willingly, and that it was himself who fixed the spring for his departure; as he wanted to collect his materials, in order that, immediately on his introduction to the king, he might make an experiment worthy of his majesty, by converting a large quantity of lead into the finest gold. I sincerely hope that he will not allow his secret to die with him, but that he will communicate it to the king. As I had the honour to dine with him on Thursday last, the 20th of this month, being seated at his side, I told him in a whisper that he could, if he liked, humble all the enemies of France. He did not deny it, but began to smile. In fact, this man is the miracle of art. Sometimes he employs the oil and powder mixed, sometimes the powder only; but in so small a quantity that, when the lingot which I made was rubbed all over with it, it did not shew at all.”

This soft-headed priest was by no means the only person in the neighbourhood who lost his wits in hopes of the boundless wealth held out by this clever impostor. Another priest, named De Lions, a chanter in the cathedral of Grenoble, writing on the 30th January 1707, says: “M. Mesnard, the curate of Montier, has written to me, stating that there is a man, about thirty-five years of age, named Delisle, who turns lead and iron into gold and silver; and that this transmutation is so veritable and so true, that the goldsmiths affirm that his gold and silver are the purest and finest they ever saw. For

five years this man was looked upon as a madman or a cheat; but the public mind is now disabused with respect to him. He now resides with M. de la Palu, at the château of the same name. M. de la Palu is not very easy in his circumstances, and wants money to portion his daughters, who have remained single till middle age, no man being willing to take them without a dowry. M. Delisle has promised to make them the richest girls in the province before he goes to court, having been sent for by the king. He has asked for a little time before his departure, in order that he may collect powder enough to make several quintals of gold before the eyes of his majesty, to whom he intends to present them. The principal matter of his wonderful powder is composed of simples, principally the herbs *Lunaria major* and *minor*. There is a good deal of the first planted by him in the gardens of La Palu; and he gets the other from the mountains that stretch about two leagues from Montier. What I tell you now is not a mere story invented for your diversion: M. Mesnard can bring forward many witnesses to its truth; among others, the Bishop of Senés, who saw these surprising operations performed; and M. de Cerisy, whom you know well. Delisle transmutes his metals in public. He rubs the lead or iron with his powder, and puts it over burning charcoal. In a short time it changes colour; the lead becomes yellow, and is found to be converted into excellent gold; the iron becomes white, and is found to be pure silver. Delisle is altogether an illiterate person. M. de St. Auban endeavoured to teach him to read and write, but he profited very little by his lessons. He is unpolite, fantastic, and a dreamer, and acts by fits and starts.”

Delisle, it would appear, was afraid of venturing to Paris. He knew that his sleight of hand would be too narrowly watched in the royal

presence; and upon some pretence or other he delayed the journey for more than two years. Desmarets, the Minister of Finance to Louis XIV., thinking the “philosopher” dreaded foul play, twice sent him a safe conduct under the king’s seal; but Delisle still refused. Upon this, Desmarets wrote to the Bishop of Senés for his real opinion as to these famous transmutations. The following was the answer of that prelate:

“Copy of a report addressed to M. Desmarets,
Comptroller-General of the Finances to His Majesty
Louis XIV., by the Bishop of Senés, dated March 1709.

“SIR,—A twelvemonth ago, or a little more, I expressed to you my joy at hearing of your elevation to the ministry; I have now the honour to write you my opinion of the Sieur Delisle, who has been working at the transmutation of metals in my diocese. I have, during the last two years, spoken of him several times to the Count de Pontchartrain, because he asked me; but I have not written to you, sir, or to M. de Chamillart, because you neither of you requested my opinion upon the subject. Now, however, that you have given me to understand that you wish to know my sentiments on the matter, I will unfold myself to you in all sincerity, for the interests of the king and the glory of your ministry.

“There are two things about the Sieur Delisle which, in my opinion, should be examined without prejudice: the one relates to his secret; the other, to his person; that is to say, whether his transmutations are real, and whether his conduct has been

regular. As regards the secret of the philosopher's stone, I deemed it impossible, for a long time; and for more than three years I was more mistrustful of the pretensions of this Sieur Delisle than of any other person. During this period I afforded him no countenance; I even aided a person, who was highly recommended to me by an influential family of this province, to prosecute Delisle for some offence or other which it was alleged he had committed. But this person, in his anger against him, having told me that he had himself been several times the bearer of gold and silver to the goldsmiths of Nice, Aix, and Avignon, which had been transmuted by Delisle from lead and iron, I began to waver a little in my opinions respecting him. I afterwards met Delisle at the house of one of my friends. To please me, the family asked Delisle to operate before me, to which he immediately consented. I offered him some iron nails, which he changed into silver in the chimney-place before six or seven credible witnesses. I took the nails thus transmuted, and sent them by my almoner to Imbert, the jeweller of Aix, who, having subjected them to the necessary trial, returned them to me, saying they were very good silver. Still, however, I was not quite satisfied. M. de Pontchartrain having hinted to me, two years previously, that I should do a thing agreeable to his majesty if I examined into this business of Delisle, I resolved to do so now. I therefore summoned the alchemist to come to me at Castellane. He came; and I had him escorted by eight or ten vigilant men, to whom I had given notice to watch his hands strictly. Before all of us he changed two pieces of lead into gold and silver. I sent them both to M. de Pontchartrain; and he

afterwards informed me by a letter, now lying before me, that he had shewn them to the most experienced goldsmiths of Paris, who unanimously pronounced them to be gold and silver of the very purest quality, and without alloy. My former bad opinion of Delisle was now indeed shaken. It was much more so when he performed transmutation five or six times before me at Senés, and made me perform it myself before him without his putting his hand to any thing. You have seen, sir, the letter of my nephew, the Père Berard, of the Oratoire at Paris, on the experiment that he performed at Castellane, and the truth of which I hereby attest. Another nephew of mine, the Sieur Bourget, who was here three weeks ago, performed the same experiment in my presence, and will detail all the circumstances to you personally at Paris. A hundred persons in my diocese have been witnesses of these things. I confess to you, sir, that, after the testimony of so many spectators and so many goldsmiths, and after the repeatedly successful experiments that I saw performed, all my prejudices vanished. My reason was convinced by my eyes; and the phantoms of impossibility which I had conjured up were dissipated by the work of my own hands.

“It now only remains for me to speak to you on the subject of his person and conduct. Three suspicions have been excited against him: the first, that he was implicated in some criminal proceeding at Cisteron, and that he falsified the coin of the realm; the second, that the king sent him two safe-conducts without effect; and the third, that he still delays going to court to operate before the king. You may see, sir, that I do not hide or avoid any thing. As regards the business at Cisteron, the Sieur

Delisle has repeatedly assured me that there was nothing against him which could reasonably draw him within the pale of justice, and that he had never carried on any calling injurious to the king's service. It was true that, six or seven years ago, he had been to Cisteron to gather herbs necessary for his powder, and that he had lodged at the house of one Pelouse, whom he thought an honest man. Pelouse was accused of clipping Louis-d'ors; and as he had lodged with him, he was suspected of being his accomplice. This mere suspicion, without any proof whatever, had caused him to be condemned for contumacy; a common case enough with judges, who always proceed with much rigour against those who are absent. During my own sojourn at Aix, it was well known that a man, named André Aluys, had spread about reports injurious to the character of Delisle, because he hoped thereby to avoid paying him a sum of forty *Louis* that he owed him. But permit me, sir, to go further, and to add that, even if there were well-founded suspicions against Delisle, we should look with some little indulgence on the faults of a man who possesses a secret so useful to the state. As regards the two safe-conducts sent him by the king, I think I can answer certainly that it was through no fault of his that he paid so little attention to them. His year, strictly speaking, consists only of the four summer months; and when by any means he is prevented from making the proper use of them, he loses a whole year. Thus the first safe-conduct became useless by the irruption of the Duke of Savoy in 1707 and the second had hardly been obtained, at the end of June 1708, when the said Delisle was insulted by a party of armed men, pretending to act

under the authority of the Count de Grignan, to whom he wrote several letters of complaint, without receiving any answer, or promise that his safety would be attended to. What I have now told you, sir, removes the third objection, and is the reason why, at the present time, he cannot go to Paris to the king, in fulfilment of his promises made two years ago. Two, or even three, summers have been lost to him, owing to the continual inquietude he has laboured under. He has, in consequence, been unable to work, and has not collected a sufficient quantity of his oil and powder, or brought what he has got to the necessary degree of perfection. For this reason also he could not give the Sieur de Bourget the portion he promised him for your inspection. If the other day he changed some lead into gold with a few grains of his powder, they were assuredly all he had; for he told me that such was the fact long before he knew my nephew was coming. Even if he had preserved this small quantity to operate before the king, I am sure that, on second thoughts, he would never have adventured with so little; because the slightest obstacles in the metals (their being too hard or too soft, which is only discovered in operating,) would have caused him to be looked upon as an impostor, if, in case his first powder had proved ineffectual, he had not been possessed of more to renew the experiment and surmount the difficulty.

“Permit me, sir, in conclusion, to repeat, that such an artist as this should not be driven to the last extremity, nor forced to seek an asylum offered to him in other countries, but which he has despised, as much from his own inclinations as from the advice I have given him. You risk nothing in giving him a little time, and

in hurrying him you may lose a great deal. The genuineness of his gold can no longer be doubted, after the testimony of so many jewellers of Aix, Lyons, and Paris in its favour. As it is not his fault that the previous safe-conducts sent to him have been of no service, it will be necessary to send him another; for the success of which I will be answerable, if you will confide the matter to me, and trust to my zeal for the service of his majesty, to whom I pray you to communicate this letter, that I may be spared the just reproaches he might one day heap upon me if he remained ignorant of the facts I have now written to you. Assure him, if you please, that, if you send me such a safe-conduct, I will oblige the Sieur Delisle to depose with me such precious pledges of his fidelity as shall enable me to be responsible myself to the king. These are my sentiments, and I submit them to your superior knowledge; and have the honour to remain, with much respect, &c.

“? JOHN BISHOP OF SENES.

“To M. Desmarets, Minister of State, and Comptroller-General of the Finances, at Paris.”

That Delisle was no ordinary impostor, but a man of consummate cunning and address, is very evident from this letter. The bishop was fairly taken in by his clever legerdemain, and when once his first distrust was conquered, appeared as anxious to deceive himself as even Delisle could have wished. His faith was so abundant that he made the case of his *protégé* his own, and would not suffer the breath of suspicion to be directed against him. Both Louis and his

minister appear to have been dazzled by the brilliant hopes he had excited, and a third pass, or safe-conduct, was immediately sent to the alchemist, with a command from the king that he should forthwith present himself at Versailles, and make public trial of his oil and powder. But this did not suit the plans of Delisle. In the provinces he was regarded as a man of no small importance; the servile flattery that awaited him wherever he went was so grateful to his mind that he could not willingly relinquish it, and run upon certain detection at the court of the monarch. Upon one pretext or another he delayed his journey, notwithstanding the earnest solicitations of his good friend the bishop. The latter had given his word to the minister, and pledged his honour that he would induce Delisle to go, and he began to be alarmed when he found he could not subdue the obstinacy of that individual. For more than two years he continued to remonstrate with him, and was always met by some excuse, that there was not sufficient powder, or that it had not been long enough exposed to the rays of the sun. At last his patience was exhausted; and fearful that he might suffer in the royal estimation by longer delay, he wrote to the king for a *lettre de cachet*, in virtue of which the alchemist was seized at the castle of La Palu, in the month of June 1711, and carried off to be imprisoned in the Bastille.

The gendarmes were aware that their prisoner was supposed to be the lucky possessor of the philosopher's stone, and on the road they conspired to rob and murder him. One of them pretended to be touched with pity for the misfortunes of the philosopher, and offered to give him an opportunity of escape whenever he could divert the attention of his companions. Delisle was profuse in his thanks, little dreaming of the snare that was laid for him. His treacherous friend

gave notice of the success of the stratagem so far; and it was agreed that Delisle should be allowed to struggle with and overthrow one of them while the rest were at some distance. They were then to pursue him and shoot him through the heart; and after robbing the corpse of the philosopher's stone, convey it to Paris on a cart, and tell M. Desmarets that the prisoner had attempted to escape, and would have succeeded if they had not fired after him and shot him through the body. At a convenient place the scheme was executed. On a given signal from the friendly gendarme, Delisle fled, while another gendarme took aim and shot him through the thigh. Some peasants arriving at the instant, they were prevented from killing him as they intended, and he was transported to Paris, maimed and bleeding. He was thrown into a dungeon in the Bastille, and obstinately tore away the bandages which the surgeons applied to his wound. He never afterwards rose from his bed.

The Bishop of Senés visited him in prison, and promised him his liberty if he would transmute a certain quantity of lead into gold before the king. The unhappy man had no longer the means of carrying on the deception; he had no gold, and no double-bottomed crucible or hollow wand to conceal it in, even if he had. He would not, however, confess that he was an impostor; but merely said he did not know how to make the powder of projection, but had received a quantity from an Italian philosopher, and had used it all in his various transmutations in Provence. He lingered for seven or eight months in the Bastille, and died from the effects of his wound, in the forty-first year of his age.

ALBERT ALUYS.

This pretender to the philosopher's stone was the son, by a former husband, of the woman Aluys, with whom Delisle became acquainted at the commencement of his career, in the cabaret by the road-side, and whom he afterwards married. Delisle performed the part of a father towards him, and thought he could shew no stronger proof of his regard, than by giving him the necessary instructions to carry on the deception which had raised himself to such a pitch of greatness. The young Aluys was an apt scholar, and soon mastered all the jargon of the alchemists. He discoursed learnedly upon projections, cimentations, sublimations, the elixir of life, and the universal alkahest; and on the death of Delisle gave out that the secret of that great adept had been communicated to him, and to him only. His mother aided in the fraud, with the hope they might both fasten themselves, in the true alchymical fashion, upon some rich dupe, who would entertain them magnificently while the operation was in progress. The fate of Delisle was no inducement for them to stop in France. The Provençals, it is true, entertained as high an opinion as ever of his skill, and were well inclined to believe the tales of the young adept on whom his mantle had fallen; but the dungeons of the Bastille were yawning for their prey, and Aluys and his mother decamped with all convenient expedition. They travelled about the Continent for several years, sponging upon credulous rich men, and now and then performing successful transmutations by the aid of double-bottomed crucibles and the like. In the year 1726, Aluys, without his mother, who appears to have died in the interval, was at Vienna, where he introduced himself to the Duke de Richelieu, at that time ambassador from the court of France. He completely deceived this nobleman; he turned lead into gold (apparently) on

several occasions, and even made the ambassador himself turn an iron nail into a silver one. The duke afterwards boasted to Lenglet du Fresnoy of his achievements as an alchemist, and regretted that he had not been able to discover the secret of the precious powder by which he performed them.

Aluys soon found that, although he might make a dupe of the Duke de Richelieu, he could not get any money from him. On the contrary, the duke expected all his pokers and fire-shovels to be made silver, and all his pewter utensils gold; and thought the honour of his acquaintance was reward sufficient for a *roturier*, who could not want wealth since he possessed so invaluable a secret. Aluys, seeing that so much was expected of him, bade adieu to his excellency, and proceeded to Bohemia accompanied by a pupil, and by a young girl who had fallen in love with him in Vienna. Some noblemen in Bohemia received him kindly, and entertained him at their houses for months at a time. It was his usual practice to pretend that he possessed only a few grains of his powder, with which he would operate in any house where he intended to fix his quarters for the season. He would make the proprietor the present of a piece of gold thus transmuted, and promise him millions, if he could only be provided with leisure to gather his *lunaria major* and *minor* on their mountain-tops, and board, lodging, and loose cash for himself, his wife, and his pupil, in the interval.

He exhausted in this manner the patience of some dozen of people, when, thinking that there was less danger for him in France under the young king Louis XV. than under his old and morose predecessor, he returned to Provence. On his arrival at Aix, he presented himself before M. le Bret, the president of the province, a

gentleman who was much attached to the pursuits of alchymy, and had great hopes of being himself able to find the philosopher's stone. M. le Bret, contrary to his expectation, received him very coolly, in consequence of some rumours that were spread abroad respecting him; and told him to call upon him on the morrow. Aluys did not like the tone of the voice, or the expression of the eye of the learned president, as that functionary looked down upon him. Suspecting that all was not right, he left Aix secretly the same evening, and proceeded to Marseilles. But the police were on the watch for him; and he had not been there four-and-twenty hours, before he was arrested on a charge of coining, and thrown into prison.

As the proofs against him were too convincing to leave him much hope of an acquittal, he planned an escape from durance. It so happened that the gaoler had a pretty daughter, and Aluys soon discovered that she was tender-hearted. He endeavoured to gain her in his favour, and succeeded. The damsel, unaware that he was a married man, conceived and encouraged a passion for him, and generously provided him with the means of escape. After he had been nearly a year in prison he succeeded in getting free, leaving the poor girl behind to learn that he was already married, and to lament in solitude that she had given her heart to an ungrateful vagabond.

When he left Marseilles, he had not a shoe to his foot or a decent garment to his back, but was provided with some money and clothes by his wife in a neighbouring town. They then found their way to Brussels, and by dint of excessive impudence, brought themselves into notice. He took a house, fitted up a splendid laboratory, and gave out that he knew the secret of transmutation. In vain did M. Percel, the brother-in-law of Lenglet du Fresnoy, who resided in that

city, expose his pretensions, and hold him up to contempt as an ignorant impostor: the world believed him not. They took the alchemist at his word, and besieged his doors to see and wonder at the clever legerdemain by which he turned iron nails into gold and silver. A rich *greffier* paid him a large sum of money that he might be instructed in the art, and Aluys gave him several lessons on the most common principles of chemistry. The *greffier* studied hard for a twelvemonth, and then discovered that his master was a quack. He demanded his money back again; but Aluys was not inclined to give it him, and the affair was brought before the civil tribunal of the province. In the mean time, however, the *greffier* died suddenly; poisoned, according to the popular rumour, by his debtor, to avoid repayment. So great an outcry arose in the city, that Aluys, who may have been innocent of the crime, was nevertheless afraid to remain and brave it. He withdrew secretly in the night, and retired to Paris. Here all trace of him is lost. He was never heard of again; but Lenglet du Fresnoy conjectures that he ended his days in some obscure dungeon, into which he was cast for coining or other malpractices.

THE COUNT DE ST. GERMAIN.

This adventurer was of a higher grade than the last, and played a distinguished part at the court of Louis XV. He pretended to have discovered the elixir of life, by means of which he could make any one live for centuries; and allowed it to be believed that his own age was upwards of two thousand years. He entertained many of the opinions of the Rosicrucians; boasted of his intercourse with sylphs and salamanders; and of his power of drawing diamonds from the earth, and pearls from the sea, by the force of his incantations. He did not

lay claim to the merit of having discovered the philosopher's stone; but devoted so much of his time to the operations of alchymy, that it was very generally believed, that if such a thing as the philosopher's stone had ever existed, or could be called into existence, he was the man to succeed in finding it.

It has never yet been discovered what was his real name, or in what country he was born. Some believed, from the Jewish cast of his handsome countenance, that he was the "wandering Jew;" others asserted that he was the issue of an Arabian princess, and that his father was a salamander; while others, more reasonable, affirmed him to be the son of a Portuguese Jew established at Bourdeaux. He first carried on his imposture in Germany, where he made considerable sums by selling an elixir to arrest the progress of old age. The Maréchal de Belle-Isle purchased a dose of it; and was so captivated with the wit, learning, and good manners of the charlatan, and so convinced of the justice of his most preposterous pretensions, that he induced him to fix his residence in Paris. Under the marshal's patronage, he first appeared in the gay circles of that capital. Every one was delighted with the mysterious stranger; who, at this period of his life, appears to have been about seventy years of age, but did not look more than forty-five. His easy assurance imposed upon most people. His reading was extensive, and his memory extraordinarily tenacious of the slightest circumstances. His pretension to have lived for so many centuries naturally exposed him to some puzzling questions, as to the appearance, life, and conversation of the great men of former days; but he was never at a loss for an answer. Many who questioned him for the purpose of scoffing at him, refrained in perplexity, quite bewildered by his

presence of mind, his ready replies, and his astonishing accuracy on every point mentioned in history. To increase the mystery by which he was surrounded, he permitted no person to know how he lived. He dressed in a style of the greatest magnificence; sported valuable diamonds in his hat, on his fingers, and in his shoe-buckles; and sometimes made the most costly presents to the ladies of the court. It was suspected by many that he was a spy, in the pay of the English ministry; but there never was a tittle of evidence to support the charge. The king looked upon him with marked favour, was often closeted with him for hours together, and would not suffer any body to speak disparagingly of him. Voltaire constantly turned him into ridicule; and, in one of his letters to the King of Prussia, mentions him as “un comte pour rire;” and states that he pretended to have dined with the holy fathers at the Council of Trent!

In the *Memoirs of Madame du Hausset*, chamber-woman to Madame du Pompadour, there are some amusing anecdotes of this personage. Very soon after his arrival in Paris, he had the *entrée* of her dressing-room; a favour only granted to the most powerful lords at the court of her royal lover. Madame was fond of conversing with him; and, in her presence, he thought fit to lower his pretensions very considerably; but he often allowed her to believe that he had lived two or three hundred years at least. “One day,” says Madame du Hausset, “madame said to him, in my presence, ‘What was the personal appearance of Francis I.? He was a king I should have liked.’ ‘He was, indeed, very captivating,’ replied St. Germain; and he proceeded to describe his face and person, as that of a man whom he had accurately observed. ‘It is a pity he was too ardent. I could have given him some good advice, which would have saved him from all

his misfortunes: but he would not have followed it; for it seems as if a fatality attended princes, forcing them to shut their ears to the wisest counsel.' 'Was his court very brilliant?' inquired Madame du Pompadour. 'Very,' replied the count; 'but those of his grandsons surpassed it. In the time of Mary Stuart and Margaret of Valois, it was a land of enchantment—a temple sacred to pleasures of every kind.' Madame said, laughing, 'You seem to have seen all this.' 'I have an excellent memory,' said he, 'and have read the history of France with great care. I sometimes amuse myself, not by making, but by letting, it be believed that I lived in old times.'

“‘But you do not tell us your age,’ said Madame du Pompadour to him on another occasion; ‘and yet you pretend you are very old. The Countess de Gergy, who was, I believe, ambassadress at Vienna some fifty years ago, says she saw you there, exactly the same as you now appear.’

“‘It is true, madame,’ replied St. Germain; ‘I knew Madame de Gergy many years ago.’

“‘But, according to her account, you must be more than a hundred years old?’

“‘That is not impossible,’ said he, laughing; ‘but it is much more possible that the good lady is in her dotage.’

“‘You gave her an elixir, surprising for the effects it produced; for she says, that during a length of time, she only appeared to be eighty-four; the age at which she took it. Why don’t you give it to the king?’

“‘Oh, madam,’ he exclaimed, ‘the physicians would have me broken on the wheel, were I to think of drugging his majesty.’”

When the world begins to believe extraordinary things of an individual, there is no telling where its extravagance will stop.

People, when once they have taken the start, vie with each other who shall believe most. At this period all Paris resounded with the wonderful adventures of the Count de St. Germain; and a company of waggish young men tried the following experiment upon its credulity: A clever mimic, who, on account of the amusement he afforded, was admitted into good society, was taken by them, dressed as the Count de St. Germain, into several houses in the Rue du Marais. He imitated the count's peculiarities admirably, and found his auditors open-mouthed to believe any absurdity he chose to utter. No fiction was too monstrous for their all-devouring credulity. He spoke of the Saviour of the world in terms of the greatest familiarity; said he had supped with him at the marriage in Canaan of Galilee, where the water was miraculously turned into wine. In fact, he said he was an intimate friend of his, and had often warned him to be less romantic and imprudent, or he would finish his career miserably. This infamous blasphemy, strange to say, found believers; and ere three days had elapsed, it was currently reported that St. Germain was born soon after the deluge, and that he would never die!

St. Germain himself was too much a man of the world to assert any thing so monstrous; but he took no pains to contradict the story. In all his conversations with persons of rank and education, he advanced his claims modestly, and as if by mere inadvertency, and seldom pretended to a longevity beyond three hundred years, except when he found he was in company with persons who would believe any thing. He often spoke of Henry VIII. as if he had known him intimately, and of the Emperor Charles V. as if that monarch had delighted in his society. He would describe conversations which took

place with such an apparent truthfulness, and be so exceedingly minute and particular as to the dress and appearance of the individuals, and even the weather at the time and the furniture of the room, that three persons out of four were generally inclined to credit him. He had constant applications from rich old women for an elixir to make them young again, and it would appear gained large sums in this manner. To those whom he was pleased to call his friends he said his mode of living and plan of diet were far superior to any elixir, and that any body might attain a patriarchal age by refraining from drinking at meals, and very sparingly at any other time. The Baron de Gleichen followed this system, and took great quantities of senna leaves, expecting to live for two hundred years. He died, however, at seventy-three. The Duchess de Choiseul was desirous of following the same system, but the duke her husband in much wrath forbade her to follow any system prescribed by a man who had so equivocal a reputation as M. de St. Germain.

Madame du Hausset says she saw St. Germain and conversed with him several times. He appeared to her to be about fifty years of age, was of the middle size, and had fine expressive features. His dress was always simple, but displayed much taste. He usually wore diamond rings of great value, and his watch and snuff-box were ornamented with a profusion of precious stones. One day, at Madame du Pompadour's apartments, where the principal courtiers were assembled, St. Germain made his appearance in diamond knee and shoe buckles of so fine a water, that madame said she did not think the king had any equal to them. He was entreated to pass into the antechamber and undo them, which he did, and brought them to madame for closer inspection. M. de Gontant, who was present, said

their value could not be less than two hundred thousand livres, or upwards of eight thousand pounds sterling. The Baron de Gleichen, in his *Memoirs*, relates that the count one day shewed him so many diamonds, that he thought he saw before him all the treasures of Aladdin's lamp; and adds, that he had had great experience in precious stones, and was convinced that all those possessed by the count were genuine. On another occasion St. Germain shewed Madame du Pompadour a small box, containing topazes, emeralds, and diamonds worth half a million of livres. He affected to despise all this wealth, to make the world more easily believe that he could, like the Rosicrucians, draw precious stones out of the earth by the magic of his song. He gave away a great number of these jewels to the ladies of the court; and Madame du Pompadour was so charmed with his generosity, that she gave him a richly enamelled snuff-box as a token of her regard, on the lid of which was beautifully painted a portrait of Socrates, or some other Greek sage, to whom she compared him. He was not only lavish to the mistresses, but to the maids. Madame du Hausset says: "The count came to see Madame du Pompadour, who was very ill, and lay on the sofa. He shewed her diamonds enough to furnish a king's treasury. Madame sent for me to see all those beautiful things. I looked at them with an air of the utmost astonishment; but I made signs to her that I thought them all false. The count felt for something in a pocket-book about twice as large as a spectacle-case, and at length drew out two or three little paper packets, which he unfolded, and exhibited a superb ruby. He threw on the table, with a contemptuous air, a little cross of green and white stones. I looked at it, and said it was not to be despised. I then put it on, and admired it greatly. The count begged me to accept it; I

refused. He urged me to take it. At length he pressed so warmly, that madame, seeing it could not be worth more than a thousand livres, made me a sign to accept it. I took the cross, much pleased with the count's politeness."

How the adventurer obtained his wealth remains a secret. He could not have made it all by the sale of his *elixir vitæ* in Germany, though no doubt some portion of it was derived from that source. Voltaire positively says he was in the pay of foreign governments; and in his letter to the King of Prussia, dated the 5th of April 1758, says that he was initiated in all the secrets of Choiseul, Kaunitz, and Pitt. Of what use he could be to any of those ministers, and to Choiseul especially, is a mystery of mysteries.

There appears no doubt that he possessed the secret of removing spots from diamonds; and in all probability he gained considerable sums by buying at inferior prices such as had flaws in them, and afterwards disposing of them at a profit of cent per cent. Madame du Hausset relates the following anecdote on this particular: "The king," says she, "ordered a middling-sized diamond, which had a flaw in it, to be brought to him. After having it weighed, his majesty said to the count, 'The value of this diamond as it is, and with the flaw in it, is six thousand livres; without the flaw, it would be worth at least ten thousand. Will you undertake to make me a gainer of four thousand livres?' St. Germain examined it very attentively, and said, 'It is possible; it may be done. I will bring it you again in a month.' At the time appointed the count brought back the diamond without a spot, and gave it to the king. It was wrapped in a cloth of amianthos, which he took off. The king had it weighed immediately, and found it very little diminished. His majesty then sent it to his jeweller by M. de

Gontant, without telling him of any thing that had passed. The jeweller gave nine thousand six hundred livres for it. The king, however, sent for the diamond back again, and said he would keep it as a curiosity. He could not overcome his surprise, and said M. de St. Germain must be worth millions, especially if he possessed the secret of making large diamonds out of small ones. The count neither said that he could or could not, but positively asserted that he knew how to make pearls grow, and give them the finest water. The king paid him great attention, and so did Madame du Pompadour. M. du Quesnoy once said that St. Germain was a quack, but the king reprimanded him. In fact, his majesty appears infatuated by him, and sometimes talks of him as if his descent were illustrious.”

St. Germain had a most amusing vagabond for a servant, to whom he would often appeal for corroboration, when relating some wonderful event that happened centuries before. The fellow, who was not without ability, generally corroborated him in a most satisfactory manner. Upon one occasion, his master was telling a party of ladies and gentlemen, at dinner, some conversation he had had in Palestine with King Richard I. of England, whom he described as a very particular friend of his. Signs of astonishment and incredulity were visible on the faces of the company; upon which St. Germain very coolly turned to his servant, who stood behind his chair, and asked him if he had not spoken truth? “I really cannot say,” replied the man, without moving a muscle; “you forget, sir, I have only been five hundred years in your service!” “Ah! true,” said his master; “I remember now; it was a little before your time!”

Occasionally, when with men whom he could not so easily dupe, he gave utterance to the contempt with which he could scarcely avoid

regarding such gaping credulity. “These fools of Parisians,” said he to the Baron de Gleichen, “believe me to be more than five hundred years old; and, since they will have it so, I confirm them in their idea. Not but that I really am much older than I appear.”

Many other stories are related of this strange impostor; but enough have been quoted to shew his character and pretensions. It appears that he endeavoured to find the philosopher’s stone; but never boasted of possessing it. The Prince of Hesse Cassel, whom he had known years before, in Germany, wrote urgent letters to him, entreating him to quit Paris, and reside with him. St. Germain at last consented. Nothing further is known of his career. There were no gossiping memoir-writers at the court of Hesse Cassel to chronicle his sayings and doings. He died at Sleswig, under the roof of his friend the prince, in the year 1784.

CAGLIOSTRO.

This famous charlatan, the friend and successor of St. Germain, ran a career still more extraordinary. He was the arch-quack of his age, the last of the great pretenders to the philosopher's stone and the water of life, and during his brief season of prosperity, one of the most conspicuous characters of Europe.

His real name was Joseph Balsamo. He was born at Palermo, about the year 1743, of humble parentage. He had the misfortune to lose his father during his infancy, and his education was left in consequence to some relatives of his mother, the latter being too poor to afford him any instruction beyond mere reading and writing. He was sent in his fifteenth year to a monastery, to be taught the elements of chemistry and physic; but his temper was so impetuous, his indolence so invincible, and his vicious habits so deeply rooted, that he made no progress. After remaining some years, he left it with the character of an uninformed and dissipated young man, with good natural talents but a bad disposition. When he became of age, he abandoned himself to a life of riot and debauchery, and entered himself, in fact, into that celebrated fraternity, known in France and Italy as the "Knights of Industry," and in England as the "Swell Mob." He was far from being an idle or unwilling member of the corps. The first way in which he distinguished himself was by forging orders of admission to the theatres. He afterwards robbed his uncle, and counterfeited a will. For acts like these, he paid frequent

compulsory visits to the prisons of Palermo. Somehow or other he acquired the character of a sorcerer—of a man who had failed in discovering the secrets of alchymy, and had sold his soul to the devil for the gold which he was not able to make by means of transmutation. He took no pains to disabuse the popular mind on this particular, but rather encouraged the belief than otherwise. He at last made use of it to cheat a silversmith named Marano, of about sixty ounces of gold, and was in consequence obliged to leave Palermo. He persuaded this man that he could shew him a treasure hidden in a cave, for which service he was to receive the sixty ounces of gold, while the silversmith was to have all the treasure for the mere trouble of digging it up. They went together at midnight to an excavation in the vicinity of Palermo, where Balsamo drew a magic circle, and invoked the devil to shew his treasures. Suddenly there appeared half a dozen fellows, the accomplices of the swindler, dressed to represent devils, with horns on their heads, claws to their fingers, and vomiting apparently red and blue flame. They were armed with pitchforks, with which they belaboured poor Marano till he was almost dead, and robbed him of his sixty ounces of gold and all the valuables he carried about his person. They then made off, accompanied by Balsamo, leaving the unlucky silversmith to recover or die at his leisure. Nature chose the former course; and soon after daylight he was restored to his senses, smarting in body from his blows and in spirit for the deception of which he had been the victim. His first impulse was to denounce Balsamo to the magistrates of the town; but on further reflection he was afraid of the ridicule that a full exposure of all the circumstances would draw upon him; he therefore took the truly Italian resolution of being revenged on Balsamo, by

murdering him at the first convenient opportunity. Having given utterance to this threat in the hearing of a friend of Balsamo, it was reported to the latter, who immediately packed up his valuables and quitted Europe.

He chose Medina, in Arabia, for his future dwelling-place, and there became acquainted with a Greek named Altotas, a man exceedingly well versed in all the languages of the East, and an indefatigable student of alchymy. He possessed an invaluable collection of Arabian manuscripts on his favourite science, and studied them with such unremitting industry that he found he had not sufficient time to attend to his crucibles and furnaces without neglecting his books. He was looking about for an assistant when Balsamo opportunely presented himself, and made so favourable an impression that he was at once engaged in that capacity. But the relation of master and servant did not long subsist between them; Balsamo was too ambitious and too clever to play a secondary part, and within fifteen days of their first acquaintance they were bound together as friends and partners. Altotas, in the course of a long life devoted to alchymy, had stumbled upon some valuable discoveries in chemistry, one of which was an ingredient for improving the manufacture of flax, and imparting to goods of that material a gloss and softness almost equal to silk. Balsamo gave him the good advice to leave the philosopher's stone for the present undiscovered, and make gold out of their flax. The advice was taken, and they proceeded together to Alexandria to trade, with a large stock of that article. They stayed forty days in Alexandria, and gained a considerable sum by their venture. They afterwards visited other cities in Egypt, and were equally successful. They also visited Turkey,

where they sold drugs and amulets. On their return to Europe, they were driven by stress of weather into Malta, and were hospitably received by Pinto, the Grand Master of the Knights, and a famous alchemist. They worked in his laboratory for some months, and tried hard to change a pewter platter into a silver one. Balsamo, having less faith than his companions, was sooner wearied; and obtaining from his host many letters of introduction to Rome and Naples, he left him and Altotas to find the philosopher's stone and transmute the pewter platter without him.

He had long since dropped the name of Balsamo on account of the many ugly associations that clung to it; and during his travels had assumed at least half a score others, with titles annexed to them. He called himself sometimes the Chevalier de Fischio, the Marquis de Melissa, the Baron de Belmonte, de Pelligrini, d'Anna, de Fenix, de Harat, but most commonly the Count de Cagliostro. Under the latter title he entered Rome, and never afterwards changed it. In this city he gave himself out as the restorer of the Rosicrucian philosophy; said he could transmute all metals into gold; that he could render himself invisible, cure all diseases, and administer an elixir against old age and decay. His letters from the Grand Master Pinto procured him an introduction into the best families. He made money rapidly by the sale of his *elixir vitæ*; and, like other quacks, performed many remarkable cures by inspiring his patients with the most complete faith and reliance upon his powers; an advantage which the most impudent charlatans often possess over the regular practitioner.

While thus in a fair way of making his fortune he became acquainted with the beautiful Lorenza Feliciano, a young lady of noble birth, but without fortune. Cagliostro soon discovered that she

possessed accomplishments that were invaluable. Besides her ravishing beauty, she had the readiest wit, the most engaging manners, the most fertile imagination, and the least principle of any of the maidens of Rome. She was just the wife for Cagliostro, who proposed himself to her, and was accepted. After their marriage, he instructed his fair Lorenza in all the secrets of his calling—taught her pretty lips to invoke angels, and genii, sylphs, salamanders, and undines, and, when need required, devils and evil spirits. Lorenza was an apt scholar; she soon learned all the jargon of the alchemists and all the spells of the enchanters; and thus accomplished the hopeful pair set out on their travels, to levy contributions on the superstitious and the credulous.

They first went to Sleswig on a visit to the Count de St. Germain, their great predecessor in the art of making dupes, and were received by him in the most magnificent manner. They no doubt fortified their minds for the career they had chosen by the sage discourse of that worshipful gentleman; for immediately after they left him, they began their operations. They travelled for three or four years in Russia, Poland, and Germany, transmuting metals, telling fortunes, raising spirits, and selling the *elixir vitæ* wherever they went; but there is no record of their doings from whence to draw a more particular detail. It was not until they made their appearance in England in 1776, that the names of the Count and Countess di Cagliostro began to acquire a European reputation. They arrived in London in the July of that year, possessed of property, in plate, jewels, and specie, to the amount of about three thousand pounds. They hired apartments in Whitcombe Street, and lived for some months quietly. In the same house there lodged a Portuguese

woman, named Blavary, who, being in necessitous circumstances, was engaged by the count as interpreter. She was constantly admitted into his laboratory, where he spent much of his time in search of the philosopher's stone. She spread abroad the fame of her entertainer in return for his hospitality, and laboured hard to impress every body with as full a belief in his extraordinary powers as she felt herself; but as a female interpreter of the rank and appearance of Madame Blavary did not exactly correspond with the count's notions either of dignity or decorum, he hired a person named Vitellini, a teacher of languages, to act in that capacity. Vitellini was a desperate gambler, a man who had tried almost every resource to repair his ruined fortunes, including among the rest the search for the philosopher's stone. Immediately that he saw the count's operations, he was convinced that the great secret was his, and that the golden gates of the palace of fortune were open to let him in. With still more enthusiasm than Madame Blavary, he held forth to his acquaintance, and in all public places, that the count was an extraordinary man, a true adept, whose fortune was immense, and who could transmute into pure and solid gold as much lead, iron, and copper as he pleased. The consequence was, that the house of Cagliostro was besieged by crowds of the idle, the credulous, and the avaricious, all eager to obtain a sight of the "philosopher," or to share in the boundless wealth which he could call into existence.

Unfortunately for Cagliostro, he had fallen into evil hands. Instead of duping the people of England, as he might have done, he became himself the victim of a gang of swindlers, who, with the fullest reliance on his occult powers, only sought to make money of him. Vitellini introduced to him a ruined gambler like himself, named

Scot, whom he represented as a Scottish nobleman, attracted to London solely by his desire to see and converse with the extraordinary man whose fame had spread to the distant mountains of the north. Cagliostro received him with great kindness and cordiality; and "Lord" Scot thereupon introduced a woman named Fry as Lady Scot, who was to act as chaperone to the Countess di Cagliostro, and make her acquainted with all the noble families of Britain. Thus things went swimmingly. "His lordship," whose effects had not arrived from Scotland, and who had no banker in London, borrowed two hundred pounds of the count. They were lent without scruple, so flattered was Cagliostro by the attentions they paid him, the respect, nay veneration they pretended to feel for him, and the complete deference with which they listened to every word that fell from his lips.

Superstitious like all desperate gamblers, Scot had often tried magical and cabalistic numbers, in the hope of discovering lucky numbers in the lottery or at the roulette-tables. He had in his possession a cabalistic manuscript, containing various arithmetical combinations of the kind, which he submitted to Cagliostro, with an urgent request that he would select a number. Cagliostro took the manuscript and studied it, but, as he himself informs us, with no confidence in its truth. He, however, predicted twenty as the successful number for the 6th of November following. Scot ventured a small sum upon this number out of the two hundred pounds he had borrowed, and won. Cagliostro, incited by this success, prognosticated number twenty-five for the next drawing. Scot tried again, and won a hundred guineas. The numbers fifty-five and fifty-seven were announced with equal success for the 18th of the same

month, to the no small astonishment and delight of Cagliostro, who thereupon resolved to try fortune for himself, and not for others. To all the entreaties of Scot and his lady that he would predict more numbers for them, he turned a deaf ear, even while he still thought him a lord and a man of honour; but when he discovered that he was a mere swindler, and the pretended Lady Scot an artful woman of the town, he closed his door upon them and on all their gang.

Having complete faith in the supernatural powers of the count, they were in the deepest distress at having lost his countenance. They tried by every means their ingenuity could suggest to propitiate him again. They implored, they threatened, and endeavoured to bribe him; but all was vain. Cagliostro would neither see nor correspond with them. In the mean time they lived extravagantly, and in the hope of future, exhausted all their present gains. They were reduced to the last extremity, when Miss Fry obtained access to the countess, and received a guinea from her on the representation that she was starving. Miss Fry, not contented with this, begged her to intercede with her husband, that for the last time he would point out a lucky number in the lottery. The countess promised to exert her influence; and Cagliostro, thus entreated, named the number eight, at the same time reiterating his determination to have no more to do with any of them. By an extraordinary hazard, which filled Cagliostro with surprise and pleasure, number eight was the greatest prize in the lottery. Miss Fry and her associates cleared fifteen hundred guineas by the adventure, and became more than ever convinced of the occult powers of Cagliostro, and strengthened in their determination never to quit him until they had made their fortunes. Out of the proceeds Miss Fry bought a handsome necklace at a pawnbroker's for ninety

guineas. She then ordered a richly-chased gold box, having two compartments, to be made at a jeweller's, and putting the necklace in the one, filled the other with a fine aromatic snuff. She then sought another interview with Madame di Cagliostro, and urged her to accept the box as a small token of her esteem and gratitude, without mentioning the valuable necklace that was concealed in it. Madame di Cagliostro accepted the present, and was from that hour exposed to the most incessant persecution from all the confederates—Blavary, Vitellini, and the pretended Lord and Lady Scot. They flattered themselves they had regained their lost footing in the house, and came day after day to know lucky numbers in the lottery, sometimes forcing themselves up the stairs, and into the count's laboratory, in spite of the efforts of the servants to prevent them. Cagliostro, exasperated at their pertinacity, threatened to call in the assistance of the magistrates, and taking Miss Fry by the shoulders, pushed her into the street.

From that time may be dated the misfortunes of Cagliostro. Miss Fry, at the instigation of her paramour, determined on vengeance. Her first act was to swear a debt of two hundred pounds against Cagliostro, and to cause him to be arrested for that sum. While he was in custody in a sponging-house, Scot, accompanied by a low attorney, broke into his laboratory, and carried off a small box, containing, as they believed, the powder of transmutation, and a number of cabalistic manuscripts and treatises upon alchymy. They also brought an action against him for the recovery of the necklace; and Miss Fry accused both him and his countess of sorcery and witchcraft, and of foretelling numbers in the lottery by the aid of the Devil. This latter charge was actually heard before Mr. Justice Miller.

The action of trover for the necklace was tried before the Lord Chief Justice of the Common Pleas, who recommended the parties to submit to arbitration. In the mean time Cagliostro remained in prison for several weeks, till having procured bail, he was liberated. He was soon after waited upon by an attorney named Reynolds, also deep in the plot, who offered to compromise all the actions upon certain conditions. Scot, who had accompanied him, concealed himself behind the door, and suddenly rushing out, presented a pistol at the heart of Cagliostro, swearing he would shoot him instantly, if he would not tell him truly the art of predicting lucky numbers and of transmuting metals. Reynolds pretending to be very angry, disarmed his accomplice, and entreated the count to satisfy them by fair means, and disclose his secrets, promising that if he would do so, they would discharge all the actions, and offer him no further molestation. Cagliostro replied, that threats and entreaties were alike useless; that he knew no secrets; and that the powder of transmutation of which they had robbed him, was of no value to any body but himself. He offered, however, if they would discharge the actions, and return the powder and the manuscripts, to forgive them all the money they had swindled him out of. These conditions were refused; and Scot and Reynolds departed, swearing vengeance against him.

Cagliostro appears to have been quite ignorant of the forms of law in England, and to have been without a friend to advise him as to the best course he should pursue. While he was conversing with his countess on the difficulties that beset them, one of his bail called, and invited him to ride in a hackney coach to the house of a person who would see him righted. Cagliostro consented, and was driven to

the King's Bench prison, where his friend left him. He did not discover for several hours that he was a prisoner, or, in fact, understand the process of being surrendered by one's bail.

He regained his liberty in a few weeks; and the arbitrators between him and Miss Fry made their award against him. He was ordered to pay the two hundred pounds she had sworn against him, and to restore the necklace and gold box which had been presented to the countess. Cagliostro was so disgusted, that he determined to quit England. His pretensions, besides, had been unmercifully exposed by a Frenchman, named Morande, the editor of the *Courrier de l'Europe*, published in London. To add to his distress, he was recognised in Westminster Hall as Joseph Balsamo, the swindler of Palermo. Such a complication of disgrace was not to be borne. He and his countess packed up their small effects, and left England with no more than fifty pounds, out of the three thousand they had brought with them.

They first proceeded to Brussels, where fortune was more auspicious. They sold considerable quantities of the elixir of life, performed many cures, and recruited their finances. They then took their course through Germany to Russia, and always with the same success. Gold flowed into their coffers faster than they could count it. They quite forgot all the woes they had endured in England, and learned to be more circumspect in the choice of their acquaintance.

In the year 1780, they made their appearance in Strasbourg. Their fame had reached that city before them. They took a magnificent hotel, and invited all the principal persons of the place to their table. Their wealth appeared to be boundless, and their hospitality equal to it. Both the count and countess acted as physicians, and gave money,

advice, and medicine to all the necessitous and suffering of the town. Many of the cures they performed astonished those regular practitioners who did not make sufficient allowance for the wonderful influence of imagination in certain cases. The countess, who at this time was not more than five-and-twenty, and all radiant with grace, beauty, and cheerfulness, spoke openly of her eldest son as a fine young man of eight-and-twenty, who had been for some years a captain in the Dutch service. The trick succeeded to admiration. All the ugly old women in Strasbourg, and for miles around, thronged the saloon of the countess to purchase the liquid which was to make them as blooming as their daughters; the young women came in equal abundance, that they might preserve their charms, and when twice as old as Ninon de l'Enclos, be more captivating than she; while men were not wanting who were fools enough to imagine that they might keep off the inevitable stroke of the grim foe by a few drops of the same incomparable elixir. The countess, sooth to say, looked like an incarnation of immortal loveliness, a very goddess of youth and beauty; and it is possible that the crowds of young men and old, who at all convenient seasons haunted the perfumed chambers of this enchantress, were attracted less by their belief in her occult powers than from admiration of her languishing bright eyes and sparkling conversation. But amid all the incense that was offered at her shrine, Madame di Cagliostro was ever faithful to her spouse. She encouraged hopes, it is true, but she never realised them; she excited admiration, yet kept it within bounds; and made men her slaves, without ever granting a favour of which the vainest might boast.

In this city they made the acquaintance of many eminent persons, and, among others, of the Cardinal Prince de Rohan, who was destined afterwards to exercise so untoward an influence over their fate. The cardinal, who seems to have had great faith in him as a philosopher, persuaded him to visit Paris in his company, which he did, but remained only thirteen days. He preferred the society of Strasbourg, and returned thither with the intention of fixing his residence far from the capital. But he soon found that the first excitement of his arrival had passed away. People began to reason with themselves, and to be ashamed of their own admiration. The populace, among whom he had lavished his charity with a bountiful hand, accused him of being the Antichrist, the Wandering Jew, the man of fourteen hundred years of age, a demon in human shape, sent to lure the ignorant to their destruction; while the more opulent and better informed called him a spy in the pay of foreign governments, an agent of the police, a swindler, and a man of evil life. The outcry grew at last so strong, that he deemed it prudent to try his fortune elsewhere.

He went first to Naples, but that city was too near Palermo; he dreaded recognition from some of his early friends, and, after a short stay, returned to France. He chose Bourdeaux as his next dwelling-place, and created as great a sensation there as he had done in Strasbourg. He announced himself as the founder of a new school of medicine and philosophy, boasted of his ability to cure all diseases, and invited the poor and suffering to visit him, and he would relieve the distress of the one class, and cure the ailings of the other. All day long the street opposite his magnificent hotel was crowded by the populace; the halt and the blind, women with sick babes in their

arms, and persons suffering under every species of human infirmity, flocked to this wonderful doctor. The relief he afforded in money more than counterbalanced the failure of his nostrums; and the affluence of people from all the surrounding country became so great, that the *jurats* of the city granted him a military guard, to be stationed day and night before his door, to keep order. The anticipations of Cagliostro were realised. The rich were struck with admiration of his charity and benevolence, and impressed with a full conviction of his marvellous powers. The sale of the elixir went on admirably. His saloons were thronged with wealthy dupes who came to purchase immortality. Beauty, that would endure for centuries, was the attraction for the fair sex; health and strength for the same period were the baits held out to the other. His charming countess, in the meantime, brought grist to the mill by telling fortunes and casting nativities, or granting attendant sylphs to any ladies who would pay sufficiently for their services. What was still better, as tending to keep up the credit of her husband, she gave the most magnificent parties in Bourdeaux.

But as at Strasbourg, the popular delusion lasted for a few months only, and burned itself out; Cagliostro forgot, in the intoxication of success, that there was a limit to quackery which once passed inspired distrust. When he pretended to call spirits from the tomb, people became incredulous. He was accused of being an enemy to religion, of denying Christ, and of being the Wandering Jew. He despised these rumours as long as they were confined to a few; but when they spread over the town, when he received no more fees, when his parties were abandoned, and his acquaintance turned away

when they met him in the street, he thought it high time to shift his quarters.



HOUSE OF CAGLIOSTRO, PARIS.

He was by this time wearied of the provinces, and turned his thoughts to the capital. On his arrival he announced himself as the restorer of Egyptian Freemasonry, and the founder of a new philosophy. He immediately made his way into the best society by means of his friend the Cardinal de Rohan. His success as a magician was quite extraordinary: the most considerable persons of the time visited him. He boasted of being able, like the Rosicrucians, to converse with the elementary spirits; to invoke the mighty dead from the grave, to transmute metals, and to discover occult things by means of the special protection of God towards him. Like Dr. Dee, he summoned the angels to reveal the future; and they appeared and conversed with him in crystals and under glass bells.⁴⁸ “There was hardly,” says the *Biographie des Contemporains*, “a fine lady in Paris who would not sup with the shade of Lucretius in the apartments of Cagliostro; a military officer who would not discuss the art of war

with Cæsar, Hannibal, or Alexander; or an advocate or counsellor who would not argue legal points with the ghost of Cicero.” These interviews with the departed were very expensive; for, as Cagliostro said, the dead would not rise for nothing. The countess, as usual, exercised all her ingenuity to support her husband’s credit. She was a great favourite with her own sex, to many a delighted and wondering auditory of whom she detailed the marvellous powers of Cagliostro. She said he could render himself invisible, traverse the world with the rapidity of thought, and be in several places at the same time. ⁴⁹

He had not been long at Paris before he became involved in the celebrated affair of the queen’s necklace. His friend the Cardinal de Rohan, enamoured of the charms of Marie Antoinette, was in sore distress at her coldness, and the displeasure she had so often manifested against him. There was at that time a lady named La Motte in the service of the queen, of whom the cardinal was foolish enough to make a confidant. Madame de la Motte, in return, endeavoured to make a tool of the cardinal, and succeeded but too well in her projects. In her capacity of chamber-woman, or lady of honour to the queen, she was present at an interview between her majesty and M. Boehmer, a wealthy jeweller of Paris, when the latter offered for sale a magnificent diamond necklace, valued at 1,600,000 francs, or about 64,000*l.* sterling. The queen admired it greatly, but dismissed the jeweller, with the expression of her regret that she was too poor to purchase it. Madame de la Motte formed a plan to get this costly ornament into her own possession, and determined to make the Cardinal de Rohan the instrument by which to effect it. She therefore sought an interview with him, and pretending to sympathise in his grief for the queen’s displeasure, told him she

knew a way by which he might be restored to favour. She then mentioned the necklace, and the sorrow of the queen that she could not afford to buy it. The cardinal, who was as wealthy as he was foolish, immediately offered to purchase the necklace, and make a present of it to the queen. Madame de la Motte told him by no means to do so, as he would thereby offend her majesty. His plan would be to induce the jeweller to give her majesty credit, and accept her promissory note for the amount at a certain date, to be hereafter agreed upon. The cardinal readily agreed to the proposal, and instructed the jeweller to draw up an agreement, and he would procure the queen's signature. He placed this in the hands of Madame de la Motte, who returned it shortly afterwards, with the words, "Bon, bon—approuvé—Marie Antoinette," written in the margin. She told him at the same time that the queen was highly pleased with his conduct in the matter, and would appoint a meeting with him in the gardens of Versailles, when she would present him with a flower, as a token of her regard. The cardinal shewed the forged document to the jeweller, obtained the necklace, and delivered it into the hands of Madame de la Motte. So far all was well. Her next object was to satisfy the cardinal, who awaited impatiently the promised interview with his royal mistress. There was at that time in Paris a young woman named D'Oliva, noted for her resemblance to the queen; and Madame de la Motte, on the promise of a handsome reward, found no difficulty in persuading her to personate Marie Antoinette, and meet the Cardinal de Rohan at the evening twilight in the gardens of Versailles. The meeting took place accordingly. The cardinal was deceived by the uncertain light, the great resemblance of the counterfeit, and his own hopes; and

having received the flower from Mademoiselle D'Oliva, went home with a lighter heart than had beat in his bosom for many a day.⁵⁰

In the course of time the forgery of the queen's signature was discovered. Boehmer the jeweller immediately named the Cardinal de Rohan and Madame de la Motte as the persons with whom he had negotiated, and they were both arrested and thrown into the Bastille. La Motte was subjected to a rigorous examination, and the disclosures she made implicating Cagliostro, he was seized, along with his wife, and also sent to the Bastille. A story involving so much scandal necessarily excited great curiosity. Nothing was to be heard of in Paris but the queen's necklace, with surmises of the guilt or innocence of the several parties implicated. The husband of Madame de la Motte escaped to England, and in the opinion of many took the necklace with him, and there disposed of it to different jewellers in small quantities at a time. But Madame de la Motte insisted that she had entrusted it to Cagliostro, who had seized and taken it to pieces, to "swell the treasures of his immense unequalled fortune." She spoke of him as "an empiric, a mean alchemist, a dreamer on the philosopher's stone, a false prophet, a profaner of the true worship, the self-dubbed Count Cagliostro!" She further said that he originally conceived the project of ruining the Cardinal de Rohan; that he persuaded her, by the exercise of some magic influence over her mind, to aid and abet the scheme; and that he was a robber, a swindler, and a sorcerer!

After all the accused parties had remained for upwards of six months in the Bastille, the trial commenced. The depositions of the witnesses having been heard, Cagliostro, as the principal culprit, was first called upon for his defence. He was listened to with the most

breathless attention. He put himself into a theatrical attitude, and thus began:—"I am oppressed!—I am accused!—I am calumniated! Have I deserved this fate? I descend into my conscience, and I there find the peace that men refuse me! I have travelled a great deal—I am known over all Europe, and a great part of Asia and Africa. I have every where shewn myself the friend of my fellow-creatures. My knowledge, my time, my fortune have ever been employed in the relief of distress. I have studied and practised medicine; but I have never degraded that most noble and most consoling of arts by mercenary speculations of any kind. Though always giving, and never receiving, I have preserved my independence. I have even carried my delicacy so far as to refuse the favours of kings. I have given gratuitously my remedies and my advice to the rich; the poor have received from me both remedies and money. I have never contracted any debts, and my manners are pure and uncorrupted." After much more self-laudation of the same kind, he went on to complain of the great hardships he had endured in being separated for so many months from his innocent and loving wife, who, as he was given to understand, had been detained in the Bastille, and perhaps chained in an unwholesome dungeon. He denied unequivocally that he had the necklace, or that he had ever seen it; and to silence the rumours and accusations against him, which his own secrecy with regard to the events of his life had perhaps originated, he expressed himself ready to satisfy the curiosity of the public, and to give a plain and full account of his career. He then told a romantic and incredible tale, which imposed upon no one. He said he neither knew the place of his birth nor the name of his parents, but that he spent his infancy in Medina, in Arabia, and was brought

up under the name of Acharat. He lived in the palace of the Great Muphti in that city, and always had three servants to wait upon him, besides his preceptor, named Althotas. This Althotas was very fond of him, and told him that his father and mother, who were Christians and nobles, died when he was three months old, and left him in the care of the Muphti. He could never, he said, ascertain their names, for whenever he asked Althotas the question, he was told that it would be dangerous for him to know. Some incautious expressions dropped by his preceptor gave him reason to think they were from Malta. At the age of twelve he began his travels, and learned the various languages of the East. He remained three years in Mecca, where the cherif, or governor, shewed him so much kindness, and spoke to him so tenderly and affectionately, that he sometimes thought that personage was his father. He quitted this good man with tears in his eyes, and never saw him afterwards; but he was convinced that he was, even at that moment, indebted to his care for all the advantages he enjoyed. Whenever he arrived in any city, either of Europe or Asia, he found an account opened for him at the principal bankers' or merchants'. He could draw upon them to the amount of thousands and hundreds of thousands; and no questions were ever asked beyond his name. He had only to mention the word 'Acharat,' and all his wants were supplied. He firmly believed that the Cherif of Mecca was the friend to whom all was owing. This was the secret of his wealth, and he had no occasion to resort to swindling for a livelihood. It was not worth his while to steal a diamond necklace when he had wealth enough to purchase as many as he pleased, and more magnificent ones than had ever been worn by a queen of France. As to the other charges brought against him by Madame de

la Motte, he had but a short answer to give. She had called him an empiric. He was not unfamiliar with the word. If it meant a man who, without being a physician, had some knowledge of medicine, and took no fees—who cured both rich and poor, and took no money from either, he confessed that he was such a man, that he was an empiric. She had also called him a mean alchemist. Whether he were an alchemist or not, the epithet *mean* could only be applied to those who begged and cringed, and he had never done either. As regarded his being a dreamer about the philosopher's stone, whatever his opinions upon that subject might be, he had been silent, and had never troubled the public with his dreams. Then, as to his being a false prophet, he had not always been so; for he had prophesied to the Cardinal de Rohan, that Madame de la Motte would prove a dangerous woman, and the result had verified the prediction. He denied that he was a profaner of the true worship, or that he had ever striven to bring religion into contempt; on the contrary, he respected every man's religion, and never meddled with it. He also denied that he was a Rosicrucian, or that he had ever pretended to be three hundred years of age, or to have had one man in his service for a hundred and fifty years. In conclusion, he said every statement that Madame de la Motte had made regarding him was false, and that she was *mentiris impudentissime*, which two words he begged her counsel to translate for her, as it was not polite to tell her so in French.

Such was the substance of his extraordinary answer to the charges against him; an answer which convinced those who were before doubtful that he was one of the most impudent impostors that had ever run the career of deception. Counsel were then heard on behalf

of the Cardinal de Rohan and Madame de la Motte. It appearing clearly that the cardinal was himself the dupe of a vile conspiracy, and there being no evidence against Cagliostro, they were both acquitted. Madame de la Motte was found guilty, and sentenced to be publicly whipped, and branded with a hot iron on the back.

Cagliostro and his wife were then discharged from custody. On applying to the officers of the Bastille for the papers and effects which had been seized at his lodgings, he found that many of them had been abstracted. He thereupon brought an action against them for the recovery of his Mss. and a small portion of the powder of transmutation. Before the affair could be decided, he received orders to quit Paris within four-and-twenty hours. Fearing that if he were once more enclosed in the dungeons of the Bastille he should never see daylight again, he took his departure immediately and proceeded to England. On his arrival in London he made the acquaintance of the notorious Lord George Gordon, who espoused his cause warmly, and inserted a letter in the public papers, animadverting upon the conduct of the Queen of France in the affair of the necklace, and asserting that she was really the guilty party. For this letter Lord George was exposed to a prosecution at the instance of the French ambassador, found guilty of libel, and sentenced to fine and a long imprisonment.

Cagliostro and the countess afterwards travelled in Italy, where they were arrested by the Papal government in 1789, and condemned to death. The charges against him were, that he was a freemason, a heretic, and a sorcerer. This unjustifiable sentence was afterwards commuted into one of perpetual imprisonment in the Castle of St. Angelo. His wife was allowed to escape severer punishment by

immuring herself in a nunnery. Cagliostro did not long survive. The loss of liberty preyed upon his mind—accumulated misfortunes had injured his health and broken his spirit, and he died early in 1790. His fate may have been no better than he deserved, but it is impossible not to feel that his sentence for the crimes assigned was utterly disgraceful to the government that pronounced it.

PRESENT STATE OF ALCHYMY.

We have now finished the list of the persons who have most distinguished themselves in this unprofitable pursuit. Among them are men of all ranks, characters, and conditions: the truth-seeking but erring philosopher; the ambitious prince and the needy noble, who have believed in it; as well as the designing charlatan, who has not believed in it, but has merely made the pretension to it the means of cheating his fellows, and living upon their credulity. One or more of all these classes will be found in the foregoing pages. It will be seen, from the record of their lives, that the delusion was not altogether without its uses. Men, in striving to gain too much, do not always overreach themselves; if they cannot arrive at the inaccessible mountain-top, they may perhaps get half way towards it, and pick up some scraps of wisdom and knowledge on the road. The useful science of chemistry is not a little indebted to its spurious brother of alchemy. Many valuable discoveries have been made in that search for the impossible, which might otherwise have been hidden for centuries yet to come. Roger Bacon, in searching for the philosopher's stone, discovered gunpowder, a still more extraordinary substance. Van Helmont, in the same pursuit, discovered the properties of gas; Geber made discoveries in

chemistry which were equally important; and Paracelsus, amidst his perpetual visions of the transmutation of metals, found that mercury was a remedy for one of the most odious and excruciating of all the diseases that afflict humanity.

In our day little mention is made in Europe of any new devotees of the science, though it is affirmed that one or two of our most illustrious men of science do not admit the pursuit to be so absurd and vain as it has been commonly considered in recent times. The belief in witchcraft, which is scarcely more absurd, still lingers in the popular mind; but few are so credulous as to believe that any elixir could make man live for centuries, or turn all our iron and pewter into gold. Alchymy, in Europe, may be said to be almost wholly exploded; but in the East it still flourishes in as great repute as ever. Recent travellers make constant mention of it, especially in China, Hindostan, Persia, Tartary, Egypt, and Arabia.

MODERN PROPHECIES.



AN epidemic terror of the end of the world has several times spread over the nations. The most remarkable was that which seized Christendom about the middle of the tenth century. Numbers of fanatics appeared in France, Germany, and Italy at that time, preaching that the thousand years prophesied in the Apocalypse as the term of the world's duration were about to expire, and that the Son of Man would appear in the clouds to judge the godly and the ungodly. The delusion appears to have been discouraged by the Church, but it nevertheless spread rapidly among the people.⁵¹

The scene of the last judgment was expected to be at Jerusalem. In the year 999, the number of pilgrims proceeding eastward, to await the coming of the Lord in that city, was so great that they were compared to a desolating army. Most of them sold their goods and possessions before they quitted Europe, and lived upon the proceeds in the Holy Land. Buildings of every sort were suffered to fall into ruins. It was thought useless to repair them, when the end of the world was so near. Many noble edifices were deliberately pulled down. Even churches, usually so well

maintained, shared the general neglect. Knights, citizens, and serfs, travelled eastwards in company, taking with them their wives and children, singing psalms as they went, and looking with fearful eyes upon the sky, which they expected each minute to open, to let the Son of God descend in his glory.

During the thousandth year the number of pilgrims increased. Most of them were smitten with terror as with a plague. Every phenomenon of nature filled them with alarm. A thunder-storm sent them all upon their knees in mid-march. It was the opinion that thunder was the voice of God, announcing the day of judgment. Numbers expected the earth to open, and give up its dead at the sound. Every meteor in the sky seen at Jerusalem brought the whole Christian population into the streets to weep and pray. The pilgrims on the road were in the same alarm:

“Lorsque, pendant la nuit, un globe de lumière
S'échappa quelquefois de la voûte de cieux,
Et traça dans sa chute un long sillon de feux,
La troupe suspendit sa marche solitaire.”⁵²

Fanatic preachers kept up the flame of terror. Every shooting star furnished occasion for a sermon, in which the sublimity of the approaching judgment was the principal topic.

The appearance of comets has been often thought to foretell the speedy dissolution of this world. Part of this belief still exists; but the comet is no longer looked upon as the sign, but the agent of destruction. So lately as in the year 1832 the greatest alarm spread over the continent of Europe, especially in Germany, lest the comet, whose appearance was then foretold by astronomers, should destroy the earth. The danger of our globe was gravely discussed. Many persons refrained from undertaking or concluding

any business during that year, in consequence solely of their apprehension that this terrible comet would dash us and our world to atoms.

During seasons of great pestilence, men have often believed the prophecies of crazed fanatics, that the end of the world was come. Credulity is always greatest in times of calamity. During the great plague, which ravaged all Europe between the years 1345 and 1350, it was generally considered that the end of the world was at hand. Pretended prophets were to be found in all the principal cities of Germany, France, and Italy, predicting that within ten years the trump of the archangel would sound, and the Saviour appear in the clouds to call the earth to judgment.

No little consternation was created in London in 1736 by the prophecy of the famous Whiston, that the world would be destroyed in that year, on the 13th of October. Crowds of people went out on the appointed day to Islington, Hampstead, and the fields intervening, to see the destruction of London, which was to be the "beginning of the end." A satirical account of this folly is given in Swift's *Miscellanies*, vol. iii., entitled *A true and faithful Narrative of what passed in London on a Rumour of the Day of Judgment*. An authentic narrative of this delusion would be interesting; but this solemn witticism of Pope and Gay is not to be depended upon.

In the year 1761 the citizens of London were alarmed by two shocks of an earthquake, and the prophecy of a third, which was to destroy them altogether. The first shock was felt on the 8th of February, and threw down several chimneys in the neighbourhood of Limehouse and Poplar; the second happened on the 8th of March, and was chiefly felt in the north of London, and towards Hampstead and Highgate. It soon became the subject of general remark, that there was exactly an interval of a month between the shocks; and a crack-brained fellow, named Bell, a soldier in the Life Guards, was so impressed with the idea that there would be a third in another month, that he lost his senses altogether, and ran about the streets predicting the destruction of London on the 5th of April. Most people thought that the *first* would have been a more appropriate day; but there

were not wanting thousands who confidently believed the prediction, and took measures to transport themselves and families from the scene of the impending calamity. As the awful day approached, the excitement became intense, and great numbers of credulous people resorted to all the villages within a circuit of twenty miles, awaiting the doom of London. Islington, Highgate, Hampstead, Harrow, and Blackheath, were crowded with panic-stricken fugitives, who paid exorbitant prices for accommodation to the housekeepers of these secure retreats. Such as could not afford to pay for lodgings at any of those places, remained in London until two or three days before the time, and then encamped in the surrounding fields, awaiting the tremendous shock which was to lay their high city all level with the dust. As happened during a similar panic in the time of Henry VIII., the fear became contagious, and hundreds who had laughed at the prediction a week before, packed up their goods, when they saw others doing so, and hastened away. The river was thought to be a place of great security, and all the merchant-vessels in the port were filled with people, who passed the night between the 4th and 5th on board, expecting every instant to see St. Paul's totter, and the towers of Westminster Abbey rock in the wind and fall amid a cloud of dust. The greater part of the fugitives returned on the following day, convinced that the prophet was a false one; but many judged it more prudent to allow a week to elapse before they trusted their dear limbs in London. Bell lost all credit in a short time, and was looked upon even by the most credulous as a mere madman. He tried some other prophecies, but nobody was deceived by them; and, in a few months afterwards, he was confined in a lunatic asylum.

A panic terror of the end of the world seized the good people of Leeds and its neighbourhood in the year 1806. It arose from the following circumstances. A hen, in a village close by, laid eggs, on which were inscribed the words, "*Christ is coming.*" Great numbers visited the spot, and examined these wondrous eggs, convinced that the day of judgment was near at hand. Like sailors in a storm, expecting every instant to go to

the bottom, the believers suddenly became religious, prayed violently, and flattered themselves that they repented them of their evil courses. But a plain tale soon put them down, and quenched their religion entirely. Some gentlemen, hearing of the matter, went one fine morning, and caught the poor hen in the act of laying one of her miraculous eggs. They soon ascertained beyond doubt that the egg had been inscribed with some corrosive ink, and cruelly forced up again into the bird's body. At this explanation, those who had prayed, now laughed, and the world wagged as merrily as of yore.

At the time of the plague in Milan, in 1630, of which so affecting a description has been left us by Ripamonte, in his interesting work, *De Peste Mediolani*, the people, in their distress, listened with avidity to the predictions of astrologers and other impostors. It is singular enough that the plague was foretold a year before it broke out. A large comet appearing in 1628, the opinions of astrologers were divided with regard to it. Some insisted that it was a forerunner of a bloody war; others maintained that it predicted a great famine; but the greater number, founding their judgment upon its pale colour, thought it portended a pestilence. The fulfilment of their prediction brought them into great repute while the plague was raging.

Other prophecies were current, which were asserted to have been delivered hundreds of years previously. They had a most pernicious effect upon the mind of the vulgar, as they induced a belief in fatalism. By taking away the hope of recovery—that greatest balm in every malady—they increased threefold the ravages of the disease. One singular prediction almost drove the unhappy people mad. An ancient couplet, preserved for ages by tradition, foretold, that in the year 1630 the devil would poison all Milan. Early one morning in April, and before the pestilence had reached its height, the passengers were surprised to see that all the doors in the principal streets of the city were marked with a curious daub, or spot, as if a sponge, filled with the purulent matter of the plague-sores, had been

pressed against them. The whole population were speedily in movement to remark the strange appearance, and the greatest alarm spread rapidly. Every means was taken to discover the perpetrators, but in vain. At last the ancient prophecy was remembered, and prayers were offered up in all the churches, that the machinations of the Evil One might be defeated. Many persons were of opinion that the emissaries of foreign powers were employed to spread infectious poison over the city; but by far the greater number were convinced that the powers of hell had conspired against them, and that the infection was spread by supernatural agencies. In the mean time the plague increased fearfully. Distrust and alarm took possession of every mind. Every thing was believed to have been poisoned by the Devil; the waters of the wells, the standing corn in the fields, and the fruit upon the trees. It was believed that all objects of touch were poisoned; the walls of the houses, the pavements of the streets, and the very handles of the doors. The populace were raised to a pitch of ungovernable fury. A strict watch was kept for the Devil's emissaries, and any man who wanted to be rid of an enemy, had only to say that he had seen him besmearing a door with ointment; his fate was certain death at the hands of the mob. An old man, upwards of eighty years of age, a daily frequenter of the church of St. Antonio, was seen, on rising from his knees, to wipe with the skirt of his cloak the stool on which he was about to sit down. A cry was raised immediately that he was besmearing the seat with poison. A mob of women, by whom the church was crowded, seized hold of the feeble old man, and dragged him out by the hair of his head, with horrid oaths and imprecations. He was traileed in this manner through the mire to the house of the municipal judge, that he might be put to the rack, and forced to discover his accomplices; but he expired on the way. Many other victims were sacrificed to the popular fury. One Mora, who appears to have been half a chemist and half a barber, was accused of being in league with the Devil to poison Milan. His house was surrounded, and a number of chemical preparations were found. The poor man asserted, that they were

intended as preservatives against infection; but some physicians, to whom they were submitted, declared they were poison, Mora was put to the rack, where he for a long time asserted his innocence. He confessed at last, when his courage was worn down by torture, that he was in league with the Devil and foreign powers to poison the whole city; that he had anointed the doors, and infected the fountains of water. He named several persons as his accomplices, who were apprehended and put to a similar torture. They were all found guilty, and executed. Mora's house was rased to the ground, and a column erected on the spot, with an inscription to commemorate his guilt.

While the public mind was filled with these marvellous occurrences, the plague continued to increase. The crowds that were brought together to witness the executions spread the infection among one another. But the fury of their passions, and the extent of their credulity, kept pace with the violence of the plague; every wonderful and preposterous story was believed. One, in particular, occupied them to the exclusion, for a long time, of every other. The Devil himself had been seen. He had taken a house in Milan, in which he prepared his poisonous unguents, and furnished them to his emissaries for distribution. One man had brooded over such tales till he became firmly convinced that the wild nights of his own fancy were realities. He stationed himself in the market-place of Milan, and related the following story to the crowds that gathered round him. He was standing, he said, at the door of the cathedral, late in the evening; and when there was nobody nigh, he saw a dark-coloured chariot, drawn by six milk-white horses, stop close beside him. The chariot was followed by a numerous train of domestics in dark liveries, mounted on dark-coloured steeds. In the chariot there sat a tall stranger of a majestic aspect; his long black hair floated in the wind—fire flashed from his large black eyes, and a curl of ineffable scorn dwelt upon his lips. The look of the stranger was so sublime that he was awed, and trembled with fear when he gazed upon him. His complexion was much darker than that of any man he

had ever seen, and the atmosphere around him was hot and suffocating. He perceived immediately that he was a being of another world. The stranger, seeing his trepidation, asked him blandly, yet majestically, to mount beside him. He had no power to refuse, and before he was well aware that he had moved, he found himself in the chariot. Onwards they went, with the rapidity of the wind, the stranger speaking no word, until they stopped before a door in the high-street of Milan. There was a crowd of people in the street, but, to his great surprise, no one seemed to notice the extraordinary equipage and its numerous train. From this he concluded that they were invisible. The house at which they stopped appeared to be a shop, but the interior was like a vast half-ruined palace. He went with his mysterious guide through several large and dimly-lighted rooms. In one of them, surrounded by huge pillars of marble, a senate of ghosts was assembled, debating on the progress of the plague. Other parts of the building were enveloped in the thickest darkness, illumined at intervals by flashes of lightning, which allowed him to distinguish a number of gibing and chattering skeletons, running about and pursuing each other, or playing at leap-frog over one another's backs. At the rear of the mansion was a wild, uncultivated plot of ground, in the midst of which arose a black rock. Down its sides rushed with fearful noise a torrent of poisonous water, which, insinuating itself through the soil, penetrated to all the springs of the city, and rendered them unfit for use. After he had been shewn all this, the stranger led him into another large chamber, filled with gold and precious stones, all of which he offered him if he would kneel down and worship him, and consent to smear the doors and houses of Milan with a pestiferous salve which he held out to him. He now knew him to be the Devil, and in that moment of temptation, prayed to God to give him strength to resist. His prayer was heard—he refused the bribe. The stranger scowled horribly upon him—a loud clap of thunder burst over his head—the vivid lightning flashed in his eyes, and the next moment he found himself standing alone at the porch of the cathedral. He repeated this

strange tale day after day, without any variation, and all the populace were firm believers in its truth. Repeated search was made to discover the mysterious house, but all in vain. The man pointed out several as resembling it, which were searched by the police; but the Demon of the Pestilence was not to be found, nor the hall of ghosts, nor the poisonous fountain. But the minds of the people were so impressed with the idea, that scores of witnesses, half crazed by disease, came forward to swear that they also had seen the diabolical stranger, and had heard his chariot, drawn by the milk-white steeds, rumbling over the streets at midnight with a sound louder than thunder.

The number of persons who confessed that they were employed by the Devil to distribute poison is almost incredible. An epidemic frenzy was abroad, which seemed to be as contagious as the plague. Imagination was as disordered as the body, and day after day persons came voluntarily forward to accuse themselves. They generally had the marks of disease upon them, and some died in the act of confession.

During the great plague of London, in 1665, the people listened with similar avidity to the predictions of quacks and fanatics. Defoe says, that at that time the people were more addicted to prophecies and astronomical conjurations, dreams, and old wives' tales than ever they were before or since. Almanacs, and their predictions, frightened them terribly. Even the year before the plague broke out, they were greatly alarmed by the comet which then appeared, and anticipated that famine, pestilence, or fire would follow. Enthusiasts, while yet the disease had made but little progress, ran about the streets, predicting that in a few days London would be destroyed.

A still more singular instance of the faith in predictions occurred in London in the year 1524. The city swarmed at that time with fortune-tellers and astrologers, who were consulted daily by people of every class in society on the secrets of futurity. As early as the month of June 1523, several of them concurred in predicting that, on the 1st day of February 1524, the waters of the Thames would swell to such a height as to overflow

the whole city of London, and wash away ten thousand houses. The prophecy met implicit belief. It was reiterated with the utmost confidence month after month, until so much alarm was excited that many families packed up their goods, and removed into Kent and Essex. As the time drew nigh, the number of these emigrants increased. In January, droves of workmen might be seen, followed by their wives and children, trudging on foot to the villages within fifteen or twenty miles, to await the catastrophe. People of a higher class were also to be seen in wagons and other vehicles bound on a similar errand. By the middle of January, at least twenty thousand persons had quitted the doomed city, leaving nothing but the bare walls of their homes to be swept away by the impending floods. Many of the richer sort took up their abode on the heights of Highgate, Hampstead, and Blackheath; and some erected tents as far away as Waltham Abbey on the north, and Croydon on the south of the Thames. Bolton, the prior of St. Bartholomew's, was so alarmed, that he erected, at a very great expense, a sort of fortress at Harrow-on-the-Hill, which he stocked with provisions for two months. On the 24th of January, a week before the awful day which was to see the destruction of London, he removed thither, with the brethren and officers of the priory and all his household. A number of boats were conveyed in wagons to his fortress, furnished abundantly with expert rowers, in case the flood, reaching so high as Harrow, should force them to go farther for a resting-place. Many wealthy citizens prayed to share his retreat; but the prior, with a prudent forethought, admitted only his personal friends, and those who brought stores of eatables for the blockade.

At last the morn, big with the fate of London, appeared in the east. The wondering crowds were astir at an early hour to watch the rising of the waters. The inundation, it was predicted, would be gradual, not sudden; so that they expected to have plenty of time to escape as soon as they saw the bosom of old Thames heave beyond the usual mark. But the majority were too much alarmed to trust to this, and thought themselves safer ten or

twenty miles off. The Thames, unmindful of the foolish crowds upon its banks, flowed on quietly as of yore. The tide ebbed at its usual hour, flowed to its usual height, and then ebbed again, just as if twenty astrologers had not pledged their words to the contrary. Blank were their faces as evening approached, and as blank grew the faces of the citizens to think that they had made such fools of themselves. At last night set in, and the obstinate river would not lift its waters to sweep away even one house out of the ten thousand. Still, however, the people were afraid to go to sleep. Many hundreds remained up till dawn of the next day, lest the deluge should come upon them like a thief in the night.

On the morrow, it was seriously discussed whether it would not be advisable to duck the false prophets in the river. Luckily for them, they thought of an expedient which allayed the popular fury. They asserted that, by an error (a very slight one,) of a little figure, they had fixed the date of this awful inundation a whole century too early. The stars were right after all, and they, erring mortals, were wrong. The present generation of cockneys was safe, and London would be washed away, not in 1524, but in 1624. At this announcement, Bolton the prior dismantled his fortress, and the weary emigrants came back.

An eye-witness of the great fire of London, in an account preserved among the Harleian Mss. in the British Museum, and published in the transactions of the Royal Society of Antiquaries, relates another instance of the credulity of the Londoners. The writer, who accompanied the Duke of York day by day through the district included between the Fleet-bridge and the Thames, states that, in their efforts to check the progress of the flames, they were much impeded by the superstition of the people. Mother Shipton, in one of her prophecies, had said that London would be reduced to ashes, and they refused to make any efforts to prevent it.⁵³ A son of the noted Sir Kenelm Digby, who was also a pretender to the gifts of prophecy, persuaded them that no power on earth could prevent the fulfilment of the prediction; for it was written in the great book of fate that London was to

be destroyed. Hundreds of persons, who might have rendered valuable assistance, and saved whole parishes from devastation, folded their arms and looked on. As many more gave themselves up, with the less compunction, to plunder a city which they could not save.⁵⁴

The prophecies of Mother Shipton are still believed in many of the rural districts of England. In cottages and servants' halls her reputation is great; and she rules, the most popular of British prophets, among all the uneducated, or half-educated, portions of the community. She is generally supposed to have been born at Knaresborough, in the reign of Henry VII., and to have sold her soul to the Devil for the power of foretelling future events. Though during her lifetime she was looked upon as a witch, she yet escaped the witch's fate, and died peaceably in her bed at an extreme old age, near Clifton in Yorkshire. A stone is said to have been erected to her memory in the churchyard of that place, with the following epitaph:

“Here lies she who never lied,
Whose skill often has been tried:
Her prophecies shall still survive,
And ever keep her name alive.”

“Never a day passed,” says her traditionary biography, “wherein, she did not relate something remarkable, and that required the most serious consideration. People flocked to her from far and near, her fame was so great. They went to her of all sorts, both old and young, rich and poor, especially young maidens, to be resolved of their doubts relating to things to come; and all returned wonderfully satisfied in the explanations she gave to their questions.” Among the rest, went the Abbot of Beverley, to whom she foretold the suppression of the monasteries by Henry VIII., his marriage with Anne Boleyn, the fires for heretics in Smithfield, and the

execution of Mary Queen of Scots. She also foretold the accession of James I., adding that, with him,

“From the cold North
Every evil should come forth.”

On a subsequent visit she uttered another prophecy, which, in the opinion of her believers, still remains unfulfilled, but may be expected to be realised during the present century:

“The time shall come when seas of blood
Shall mingle with a greater flood.
Great noise there shall be heard—great shouts and cries,
And seas shall thunder louder than the skies;
Then shall three lions fight with three and bring
Joy to a people, honour to a king.
That fiery year as soon as o’er,
Peace shall then be as before;
Plenty shall every where be found,
And men with swords shall plough the ground.”

But the most famous of all her prophecies is one relating to London. Thousands of persons still shudder to think of the woes that are to burst over this unhappy realm, when London and Highgate are joined by one continuous line of houses. This junction, which, if the rage for building lasts much longer, in the same proportion as heretofore, bids fair to be soon accomplished, was predicted by her shortly before her death. Revolutions—the fall of mighty monarchs, and the shedding of much blood

are to signalise that event. The very angels, afflicted by our woes, are to turn aside their heads, and weep for hapless Britain.

But great as is the fame of Mother Shipton, she ranks but second in the list of British prophets. Merlin, the mighty Merlin, stands alone in his high pre-eminence—the first and greatest. As old Drayton sings, in his *Polyolbion*:

“Of Merlin and his skill what region doth not hear?
The world shall still be full of Merlin every year.
A thousand lingering years his prophecies have run,
And scarcely shall have end till time itself be done.”

Spenser, in his divine poem, has given us a powerful description of this renowned seer—

“who had in magic more insight
Than ever him before, or after, living wight.

For he by words could call out of the sky
Both sun and moon, and make them him obey;
The land to sea, and sea to mainland dry,
And darksome night he eke could turn to day—
Huge hosts of men he could, alone, dismay.
And hosts of men and meanest things could frame,
Whenso him list his enemies to fray,
That to this day, for terror of his name,
The fiends do quake, when any him to them does name.

And soothe men say that he was not the sonne
Of mortal sire or other living wighte,

But wondrously begotten and begoune
By false illusion of a guileful sprite
On a faire ladye nun.”

In these verses the poet has preserved the popular belief with regard to Merlin, who is generally supposed to have been a contemporary of Vortigern. Opinion is divided as to whether he were a real personage, or a mere impersonation, formed by the poetic fancy of a credulous people. It seems most probable that such a man did exist, and that, possessing knowledge as much above the comprehension of his age, as that possessed by Friar Bacon was beyond the reach of his, he was endowed by the wondering crowd with the supernatural attributes that Spenser has enumerated.

Geoffrey of Monmouth translated Merlin's poetical odes, or prophecies, into Latin prose; and he was much revered not only by Geoffrey, but by most of the old annalists. In a *Life of Merlin, with his Prophecies and Predictions interpreted and made good by our English Annals*, by Thomas Heywood, published in the reign of Charles I., we find several of these pretended prophecies. They seem, however, to have been all written by Heywood himself. They are in terms too plain and positive to allow any one to doubt for a moment of their having been composed *ex post facto*. Speaking of Richard I., he says:

“The Lion's heart will 'gainst the Saracen rise,
And purchase from him many a glorious prize;
The rose and lily shall at first unite,
But, parting of the prey prove opposite. * * *
But while abroad these great acts shall be done,
All things at home shall to disorder run.
Cooped up and caged then shall the Lion be,

But, after sufferance, ransomed and set free.”

The simple-minded Thomas Heywood gravely goes on to inform us, that all these things actually came to pass. Upon Richard III. he is equally luminous. He says:

“A hunch-backed monster, who with teeth is born,
The mockery of art and nature’s scorn;
Who from the womb preposterously is hurled,
And with feet forward thrust into the world,
Shall, from the lower earth on which he stood,
Wade, every step he mounts, knee-deep in blood.
He shall to th’ height of all his hopes aspire,
And, clothed in state, his ugly shape admire;
But, when he thinks himself most safe to stand,
From foreign parts a native whelp shall land.”

Another of these prophecies after the event tells us that Henry VIII. should take the power from Rome, “and bring it home unto his British bower;” that he should “root out from the land all the razored skulls;” and that he should neither spare “man in his rage nor woman in his lust;” and that, in the time of his next successor but one, “there should come in the fagot and the stake.” Master Heywood closes Merlin’s prophecies at his own day, and does not give even a glimpse of what was to befall England after his decease. Many other prophecies, besides those quoted by him, were, he says, dispersed abroad, in his day, under the name of Merlin; but he gives his readers a taste of one only, and that is the following:

“When hempe is ripe and ready to pull,

Then, Englishman, beware thy skull.”

This prophecy, which, one would think, ought to have put him in mind of the gallows, at that time the not unusual fate of false prophets, he explains thus: “In this word HEMPE be five letters. Now, by reckoning the five successive princes from Henry VIII., this prophecy is easily explained: H signifieth King Henry before-named; E, Edward, his son, the sixth of that name; M, Mary, who succeeded him; P, Philip of Spain, who, by marrying Queen Mary, participated with her in the English diadem; and, lastly, E signifieth Queen Elizabeth, after whose death there was a great feare that some troubles might have arisen about the crown.” As this did not happen, Heywood, who was a sly rogue in a small way, gets out of the scrape by saying, “Yet proved this augury true, though not according to the former expectation; for, after the peaceful inauguration of King James, there was great mortality, not in London only, but through the whole kingdom, and from which the nation was not quite clean in seven years after.”

This is not unlike the subterfuge of Peter of Pontefract, who had prophesied the death and deposition of King John, and who was hanged by that monarch for his pains. A very graphic and amusing account of this pretended prophet is given by Grafton, in his *Chronicles of England*.⁵⁵ “In the meanwhile,” says he, “the priestes within England had provided them a false and counterfeated prophet, called Peter Wakefelde, a Yorkshire man, who was an hermite, an idle gadder about, and a pratlyng marchant. Now, to bring this Peter in credite, and the kyng out of all credite with his people, diverse vaine persons bruted dayly among the commons of the realme, that Christe had twice appered unto him in the shape of a childe, betwene the priestes’s handes, once at Yorke, another tyme at Pomfret; and that he had breathed upon him thrice, saying, ‘Peace, peace, peace,’ and teachyng many things, which he anon declared to the bishops, and bid the people amend their naughtie living. Being rapt also in spirite, they sayde he

behelde the joyes of heaven and sorrowes of hell; for scant were there three in the realme, sayde he, that lived christianly.

“This counterfeated soothsayer prophesied of King John, that he should reigne no longer than the Ascension-day next followyng, which was in the yere of our Lord 1211, and was the thirteenth yere from his coronation; and this, he said, he had by revelation. Then it was of him demanded, whether he should be slaine or be deposed, or should voluntarily give over the crowne? He aunswered, that he could not tell; but of this he was sure (he sayd), that neither he nor any of his stock or lineage should reigne after that day.

“The king, hering of this, laughed much at it, and made but a scoff thereat. ‘Tush!’ saith he, ‘it is but an ideot knave, and such an one as lacketh his right wittes.’ But when this foolish prophet had so escaped the daunger of the kinge’s displeasure, and that he made no more of it, he gate him abroad, and prated thereof at large, as he was a very idle vagabond, and used to trattle and talke more than ynough; so that they which loved the king caused him anon after to be apprehended as a malefactor, and to be throwen in prison, the king not yet knowing thereof.

“Anone after the fame of this phantasticall prophet went all the realme over, and his name was knowen every where, as foolishnesse is much regarded of the people, where wisdom is not in place; specially because he was then imprisoned for the matter, the rumour was the larger, their wonderynges were the wantoner, their practises the foolisher, their busye talkes and other idle doinges the greater. Continually from thence, as the rude manner of people is, old gossyps tales went abroad, new tales were invented, fables were added to fables, and lyes grew upon lyes. So that every daye newe slanders were laide upon the king, and not one of them true. Rumors arose, blasphemyes were sprede, the enemyes rejoyced, and treasons by the

priestes were mainteyned; and what lykewise was surmised, or other subtiltye practised, all was then fathered upon this foolish prophet, as 'thus saith Peter Wakefield;' 'thus hath he prophesied;' 'and thus it shall come to pass;' yea, many times, when he thought nothing lesse. And when the Ascension-day was come, which was prophecyed of before, King John commanded his royal tent to be spread in the open field, passing that day with his noble counseyle and men of honour in the greatest solemnitie that ever he did before; solacing himself with musickale instrumentes and songs, most in sight among his trustie friendes. When that day was paste in all prosperitie and myrth, his enemyes being confused, turned all into an allegorical understanding to make the prophecie good, and sayde, 'He is no longer king, for the pope reigneth, and not he.' [King John was labouring under a sentence of excommunication at the time.]

"Then was the king by his council perswaded that this false prophet had troubled the realme, perverted the heartes of the people, and raysed the Commons against him; for his wordes went over the sea, by the help of his prelates, and came to the French king's eare, and gave to him a great encouragement to invade the lande. He had not else done it so sodeinely. But he was most fowly deceived, as all they are and shall be that put their trust in such dark drowsye dreames of hipocrites. The king therefore commended that he should be hanged up, and his sonne also with him, lest any more false prophets should arise of that race."

Heywood, who was a great stickler for the truth of all sorts of prophecies, gives a much more favourable account of this Peter of Pomfret, or Pontefract, whose fate he would, in all probability, have shared, if he had had the misfortune to have flourished in the same age. He says, that Peter, who was not only a prophet, but a bard, predicted divers of King John's disasters, which fell out accordingly. On being taxed for a lying prophet in

having predicted that the king would be deposed before he entered into the fifteenth year of his reign, he answered him boldly, that all he had said was justifiable and true; for that, having given up his crown to the pope, and paying him an annual tribute, the pope reigned, and not he. Heywood thought this explanation to be perfectly satisfactory, and the prophet's faith for ever established.

But to return to Merlin. Of him even to this day it may be said, in the words which Burns has applied to another notorious personage,

“Great was his power and great his fame;
Far kened and noted is his name.”

His reputation is by no means confined to the land of his birth, but extends through most of the nations of Europe. A very curious volume of his *Life, Prophecies, and Miracles*, written, it is supposed, by Robert de Bosron, was printed at Paris in 1498, which states, that the devil himself was his father, and that he spoke the instant he was born, and assured his mother, a very virtuous young woman, that she should not die in childbed with him, as her ill-natured neighbours had predicted. The judge of the district, hearing of so marvellous an occurrence, summoned both mother and child to appear before him; and they went accordingly the same day. To put the wisdom of the young prophet most effectually to the test, the judge asked him if he knew his own father? To which the infant Merlin replied, in a clear, sonorous voice, “Yes, my father is the Devil; and I have his power, and know all things, past, present, and to come.” His worship clapped his hands in astonishment, and took the prudent resolution of not molesting so awful a child or its mother either.

Early tradition attributes the building of Stonehenge to the power of Merlin. It was believed that those mighty stones were whirled through the air, at his command, from Ireland to Salisbury Plain; and that he arranged

them in the form in which they now stand, to commemorate for ever the unhappy fate of three hundred British chiefs, who were massacred on that spot by the Saxons.

At Abergwylly, near Carmarthen, is still shewn the cave of the prophet and the scene of his incantations. How beautiful is the description of it given by Spenser in his *Faerie Queene*! The lines need no apology for their repetition here, and any sketch of the great prophet of Britain would be incomplete without them:

“There the wise Merlin, whilom wont (they say,)
To make his wonne low underneath the ground,
In a deep delve far from the view of day,
That of no living wight he mote be found,
Whenso he counselled with his sprites encompassed round.

And if thou ever happen that same way
To travel, go to see that dreadful place;
It is a hideous, hollow cave, they say,
Under a rock that lies, a little space
From the swift Barry, tumbling down apace
Amongst the woody hills of Dynevoure;
But dare thou not, I charge, in any case,
To enter into that same baleful bower,
For fear the cruel fiendes should thee unwares devour!

But, standing high aloft, low lay thine eare,
And there such ghastly noise of iron chaines
And brazen caudrons thou shalt rombling heare,
Which thousand sprites with long-enduring paines
Doe tosse, that it will stun thy feeble braines;
And often times great groans and grievous stownds,

When too huge toyle and labour them constraines;
And often times loud strokes and ringing sounds
From under that deep rock most horribly rebounds.

The cause, they say, is this. A little while
Before that Merlin died, he did intend
A brazen wall in compass, to compile
About Cayr Merdin, and did it commend
Unto these sprites to bring to perfect end;
During which work the Lady of the Lake,
Whom long he loved, for him in haste did send,
Who thereby forced his workmen to forsake,
Them bound till his return their labour not to slake.

In the mean time, through that false ladie's traine,
He was surprised, and buried under biere,
Ne ever to his work returned again;
Natheless these fiendes may not their work forbear,
So greatly his commandement they fear,
But there doe toyle and travaile day and night,
Until that brazen wall they up doe reare.”⁵⁶

Amongst other English prophets, a belief in whose power has not been entirely effaced by the light of advancing knowledge, is Robert Nixon, the Cheshire idiot, a contemporary of Mother Shipton. The popular accounts of this man say, that he was born of poor parents, not far from Vale Royal, on the edge of the forest of Delamere. He was brought up to the plough, but was so ignorant and stupid, that nothing could be made of him. Every body thought him irretrievably insane, and paid no attention to the strange, unconnected discourses which he held. Many of his prophecies are believed to have been lost in this manner. But they were not always destined to be

wasted upon dull and inattentive ears. An incident occurred which brought him into notice, and established his fame as a prophet of the first calibre. He was ploughing in a field when he suddenly stopped from his labour, and with a wild look and strange gesture, exclaimed, "*Now, Dick! now, Harry! O, ill done, Dick! O, well done, Harry! Harry has gained the day!*" His fellow-labourers in the field did not know what to make of this rhapsody; but the next day cleared up the mystery. News was brought by a messenger, in hot haste, that at the very instant when Nixon had thus ejaculated, Richard III. had been slain at the battle of Bosworth, and Henry VII. proclaimed king of England.

It was not long before the fame of the new prophet reached the ears of the king, who expressed a wish to see and converse with him. A messenger was accordingly despatched to bring him to court; but long before he reached Cheshire, Nixon knew and dreaded the honours that awaited him. Indeed it was said, that at the very instant the king expressed the wish, Nixon was, by supernatural means, made acquainted with it, and that he ran about the town of Over in great distress of mind, calling out, like a madman, that Henry had sent for him, and that he must go to court, and be *clammed*, that is, starved to death. These expressions excited no little wonder; but, on the third day, the messenger arrived, and carried him to court, leaving on the minds of the good people of Cheshire an impression that their prophet was one of the greatest ever born. On his arrival King Henry appeared to be troubled exceedingly at the loss of a valuable diamond, and asked Nixon if he could inform him where it was to be found. Henry had hidden the diamond himself, with a view to test the prophet's skill. Great, therefore, was his surprise when Nixon answered him in the words of the old proverb, "Those who hide can find." From that time forth the king implicitly believed that he had the gift of prophecy, and ordered all his words to be taken down.

During all the time of his residence at court he was in constant fear of being starved to death, and repeatedly told the king that such would be his

fate, if he were not allowed to depart, and return into his own country. Henry would not suffer it, but gave strict orders to all his officers and cooks to give him as much to eat as he wanted. He lived so well, that for some time he seemed to be thriving like a nobleman's steward, and growing as fat as an alderman. One day the king went out hunting, when Nixon ran to the palace gate, and entreated on his knees that he might not be left behind to be starved. The king laughed, and calling an officer, told him to take especial care of the prophet during his absence, and rode away to the forest. After his departure, the servants of the palace began to jeer at and insult Nixon, whom they imagined to be much better treated than he deserved. Nixon complained to the officer, who, to prevent him from being further molested, locked him up in the king's own closet, and brought him regularly his four meals a day. But it so happened that a messenger arrived from the king to this officer, requiring his immediate presence at Winchester, on a matter of life and death. So great was his haste to obey the king's command, that he mounted on the horse behind the messenger, and rode off, without bestowing a thought upon poor Nixon. He did not return till three days afterwards, when, remembering the prophet for the first time, he went to the king's closet, and found him lying upon the floor, starved to death, as he had predicted.

Among the prophecies of his which are believed to have been fulfilled are the following, which relate to the times of the Pretender:

*“A great man shall come into England,
But the son of a king
Shall take from him the victory.”*

*“Crows shall drink the blood of many nobles,
And the North shall rise against the South.”*

*“The coek of the North shall be made to flee,
And his feather be plucked for his pride,
That he shall almost curse the day that he was born.”*

All these, say his admirers, are as clear as the sun at noon-day. The first denotes the defeat of Prince Charles Edward, at the battle of Culloden, by the Duke of Cumberland; the second, the execution of Lords Derwentwater, Balmerino, and Lovat; and the third, the retreat of the Pretender from the shores of Britain. Among the prophecies that still remain to be accomplished are the following:

*“Between seven, eight, and nine,
In England wonders shall be seen;
Between nine and thirteen
All sorrow shall be done.”*

*“Through our own money and our men
Shall a dreadful war begin.
Between the sickle and the suck
All England shall have a pluck.”*

*“Foreign nations shall invade England with snow on their helmets,
and shall bring plague, famine, and murder in the skirts of their
garments.”*

“The town of Nantwich shall be swept away by a flood.”

Of the two first of these no explanation has yet been attempted; but some event or other will doubtless be twisted into such a shape as will fit them. The third, relative to the invasion of England by a nation with snow on

their helmets, is supposed by the old women to foretell most clearly a coming war with Russia. As to the last, there are not a few in the town mentioned who devoutly believe that such will be its fate. Happily for their peace of mind, the prophet said nothing of the year that was to witness the awful calamity; so that they think it as likely to be two centuries hence as now.

The popular biographers of Nixon conclude their account of him by saying, that “his prophecies are by some persons thought fables; yet by what has come to pass, it is now thought, and very plainly appears, that most of them have proved, or will prove, true; for which we, on all occasions, ought not only to exert our utmost might to repel by force our enemies, but to refrain from our abandoned and wicked course of life, and to make our continual prayer to God for protection and safety.” To this, though a *non sequitur*, every one will cry, Amen!

Besides the prophets, there have been the almanac-makers Lilly, Poor Robin, Partridge, and Francis Moore physician, in England and Matthew Laensbergh, in France and Belgium. But great as were their pretensions, they were modesty itself in comparison with Merlin, Shipton, and Nixon, who fixed their minds upon higher things than the weather, and were not so restrained as to prophesy for only one year at a time. After such prophets the almanac-makers hardly deserve to be mentioned; not even the renowned Partridge, whose prognostications set all England agog in 1708, and whose death while still alive was so pleasantly and satisfactorily proved by Isaac Bickerstaff. The anti-climax would be too palpable, and they and their doings must be left uncommemorated.



MOTHER SHIPTON'S HOUSE. ⁵⁷

FORTUNE-TELLING.

And men still grope t' anticipate
The cabinet designs of Fate;
Apply to wizards to foresee
What shall and what shall never be.

Hudibras, part iii, canto 3.

IN accordance with the plan laid down, we proceed to the consideration of the follies into which men have been led by their eager desire to pierce the thick darkness of futurity. God himself, for his own wise purposes, has more than once undrawn the impenetrable veil which shrouds those awful secrets; and, for purposes just as wise, he has decreed that, except in these instances, ignorance shall be our lot for ever. It is happy for man that he does not know what the morrow is to bring forth; but, unaware of this great blessing, he has, in all ages of the world, presumptuously endeavoured to trace the events of unborn centuries, and anticipate the march of time. He has reduced this presumption into a study. He has divided it into sciences and systems without number, employing his whole life in the vain pursuit. Upon no subject has it been so easy to deceive the world as upon this. In every breast the curiosity exists in a greater or less degree, and can only be conquered by a long course of self-examination, and a firm reliance that the future would not be hidden from our sight, if it were right that we should be acquainted with it.

An undue opinion of our own importance in the scale of creation is at the bottom of all our unwarrantable notions in this respect. How flattering to the pride of man to think that the stars in their courses watch over him,

and typify, by their movements and aspects, the joys or the sorrows that await him! He, less in proportion to the universe than the all-but invisible insects that feed in myriads on a summer's leaf are to this great globe itself, fondly imagines that eternal worlds were chiefly created to prognosticate his fate. How we should pity the arrogance of the worm that crawls at our feet, if we knew that it also desired to know the secrets of futurity, and imagined that meteors shot athwart the sky to warn it that a tom-tit was hovering near to gobble it up; that storms and earthquakes, the revolutions of empires, or the fall of mighty monarchs, only happened to predict its birth, its progress, and its decay! Not a whit less presuming has man shewn himself; not a whit less arrogant are the sciences, so called, of astrology, augury, necromancy, geomancy, palmistry, and divination of every kind.

Leaving out of view the oracles of pagan antiquity and religious predictions in general, and confining ourselves solely to the persons who, in modern times, have made themselves most conspicuous in foretelling the future, we shall find that the sixteenth and seventeenth centuries were the golden age of these impostors. Many of them have been already mentioned in their character of alchemists. The union of the two pretensions is not at all surprising. It was to be expected that those who assumed a power so preposterous as that of prolonging the life of man for several centuries, should pretend, at the same time, to foretell the events which were to mark that preternatural span of existence. The world would as readily believe that they had discovered all secrets, as that they had only discovered one. The most celebrated astrologers of Europe, three centuries ago, were alchemists. Agrippa, Paracelsus, Dr. Dee, and the Rosicrucians, all laid as much stress upon their knowledge of the days to come, as upon their pretended possession of the philosopher's stone and the elixir of life. In their time, ideas of the wonderful, the diabolical, and the supernatural, were rifer than ever they were before. The devil or the stars were universally believed to meddle constantly in the affairs of men; and both were to be consulted with proper ceremonies. Those who were of a

melancholy and gloomy temperament betook themselves to necromancy and sorcery; those more cheerful and aspiring devoted themselves to astrology. The latter science was encouraged by all the monarchs and governments of that age. In England, from the time of Elizabeth to that of William and Mary, judicial astrology was in high repute. During that period flourished Drs. Dee, Lamb, and Forman; with Lilly, Booker, Gadbury, Evans, and scores of nameless impostors in every considerable town and village in the country, who made it their business to cast nativities, aid in the recovery of stolen goods, prognosticate happy or unhappy marriages, predict whether journeys would be prosperous, and note lucky moments for the commencement of any enterprise, from the setting up of a cobbler's shop to the marching of an army. Men who, to use the words of Butler, did

“Deal in Destiny’s dark counsel,
And sage opinion of the moon sell;
To whom all people far and near
On deep importance did repair,
When brass and pewter pots did stray,
And linen slunk out of the way.”



HENRY ANDREWS, THE ORIGINAL “FRANCIS MOORE.”

In Lilly’s *Memoirs of his Life and Times*, there are many notices of the inferior quacks who then abounded, and upon whom he pretended to look down with supreme contempt; not because they were astrologers, but

because they debased that noble art by taking fees for the recovery of stolen property. From Butler's *Hudibras*, and its curious notes, we may learn what immense numbers of these fellows lived upon the credulity of mankind in that age of witchcraft and diablerie. Even in our day, how great is the reputation enjoyed by the almanac-makers, who assume the name of Francis Moore! But in the time of Charles I. and the Commonwealth the most learned, the most noble, and the most conspicuous characters did not hesitate to consult astrologers in the most open manner. Lilly, whom Butler has immortalised under the name of Sydrophel, relates, that he proposed to write a work called *An Introduction to Astrology*, in which he would satisfy the whole kingdom of the lawfulness of that art. Many of the soldiers were for it, he says, and many of the Independent party, and abundance of worthy men in the House of Commons, his assured friends, and able to take his part against the Presbyterians, who would have silenced his predictions if they could. He afterwards carried his plan into execution, and when his book was published, went with another astrologer named Booker to the headquarters of the parliamentary army at Windsor, where they were welcomed and feasted in the garden where General Fairfax lodged. They were afterwards introduced to the general, who received them very kindly, and made allusion to some of their predictions. He hoped their art was lawful and agreeable to God's word; but he did not understand it himself. He did not doubt, however, that the two astrologers feared God, and therefore he had a good opinion of them. Lilly assured him that the art of astrology was quite consonant to the Scriptures; and confidently predicted from his knowledge of the stars, that the parliamentary army would overthrow all its enemies. In Oliver's Protectorate, this quack informs us that he wrote freely enough. He became an Independent, and all the soldiery were his friends. When he went to Scotland, he saw a soldier standing in front of the army with a book of prophecies in his hand, exclaiming to the several companies as they passed

by him, “Lo! hear what Lilly saith: you are in this month promised victory! Fight it out, brave boys! and then read that month’s prediction!”

After the great fire of London, which Lilly said he had foretold, he was sent for by the committee of the House of Commons appointed to inquire into the causes of the calamity. In his *Monarchy or no Monarchy*, published in 1651, he had inserted an hieroglyphical plate representing on one side persons in winding-sheets digging graves; and on the other a large city in flames. After the great fire, some sapient member of the legislature bethought him of Lilly’s book, and having mentioned it in the house, it was agreed that the astrologer should be summoned. Lilly attended accordingly, when Sir Robert Brook told him the reason of his summons, and called upon him to declare what he knew. This was a rare opportunity for the vainglorious Lilly to vaunt his abilities; and he began a long speech in praise of himself and his pretended science. He said that, after the execution of Charles I., he was extremely desirous to know what might from that time forth happen to the parliament and to the nation in general. He therefore consulted the stars, and satisfied himself. The result of his judgment he put into emblems and hieroglyphics, without any commentary, so that the true meaning might be concealed from the vulgar, and made manifest only to the wise; imitating in this the example of many wise philosophers who had done the like.

“Did you foresee the year of the fire?” said a member. “No,” quoth Lilly, “nor was I desirous. Of that I made no scrutiny.” After some further parley, the house found they could make nothing of the astrologer, and dismissed him with great civility.

One specimen of the explanation of a prophecy given by Lilly, and related by him with much complacency, will be sufficient to shew the sort of trash by which he imposed upon the million. “In the year 1588,” says he, “there was a prophecy printed in Greek characters, exactly deciphering the long troubles of the English nation from 1641 to 1660.” And it ended thus: “And after him shall come a dreadful dead man, and with him a royal G, of

the best blood in the world; and he shall have the crown, and shall set England on the right way, and put out all heresies.” The following is the explanation of this oracular absurdity:

“Monkery being extinguished above eighty or ninety years, and the Lord General’s name being Monk, is the dead man. The royal G or C [it is gamma in the Greek, intending C in the Latin, being the third letter in the alphabet] is Charles II., who for his extraction may be said to be of the best blood of the world.”

In France and Germany astrologers met even more encouragement than they received in England. In very early ages Charlemagne and his successors fulminated their wrath against them in common with sorcerers. Louis XI., that most superstitious of men, entertained great numbers of them at his court; and Catherine de Medicis, that most superstitious of women, hardly ever undertook any affair of importance without consulting them. She chiefly favoured her own countrymen; and during the time she governed France, the land was overrun by Italian conjurors, necromancers, and fortune-tellers of every kind. But the chief astrologer of that day, beyond all doubt, was the celebrated Nostradamus, physician to her husband, King Henry II. He was born in 1503 at the town of St. Remi, in Provence, where his father was a notary. He did not acquire much fame till he was past his fiftieth year, when his famous *Centuries*, a collection of verses, written in obscure and almost unintelligible language, began to excite attention. They were so much spoken of in 1556, that Henry II. resolved to attach so skilful a man to his service, and appointed him his physician. In a biographical notice of him, prefixed to the edition of his *Vraies Centuries*, published at Amsterdam in 1668, we are informed that he often discoursed with his royal master on the secrets of futurity, and received many great presents as his reward, besides his usual allowance for medical attendance. After the death of Henry he retired to his native place,

where Charles IX. paid him a visit in 1564; and was so impressed with veneration for his wondrous knowledge of the things that were to be, not in France only, but in the whole world for hundreds of years to come, that he made him a counsellor of state and his own physician, besides treating him in other matters with a royal liberality. “In fine,” continues his biographer, “I should be too prolix were I to tell all the honours conferred upon him, and all the great nobles and learned men that arrived at his house from the very ends of the earth, to see and converse with him as if he had been an oracle. Many strangers, in fact, came to France for no other purpose than to consult him.”



NOSTRADAMUS.—FROM THE FRONTISPIECE TO A COLLECTION OF HIS PROPHECIES,
PUBLISHED AT AMSTERDAM, A.D. 1666.

The prophecies of Nostradamus consist of upwards of a thousand stanzas, each of four lines, and are to the full as obscure as the oracles of old. They take so great a latitude, both as to time and space, that they are almost sure to be fulfilled somewhere or other in the course of a few centuries. A little ingenuity, like that evinced by Lilly in his explanation about General Monk and the dreadful dead man, might easily make events to fit some of them. ⁵⁸

He is to this day extremely popular in France and the Walloon country of Belgium, where old farmer-wives consult him with great confidence and assiduity.

Catherine di Medicis was not the only member of her illustrious house who entertained astrologers. At the beginning of the fifteenth century there was a man, named Basil, residing in Florence, who was noted over all Italy for his skill in piercing the darkness of futurity. It is said that he foretold to Cosmo di Medicis, then a private citizen, that he would attain high dignity, inasmuch as the ascendant of his nativity was adorned with the same propitious aspects as those of Augustus Cæsar and the Emperor Charles V.⁵⁹ Another astrologer foretold the death of Prince Alexander di Medicis; and so very minute and particular was he in all the circumstances, that he was suspected of being chiefly instrumental in fulfilling his own prophecy—a very common resource with these fellows to keep up their credit. He foretold confidently that the prince should die by the hand of his own familiar friend, a person of a slender habit of body, a small face, a swarthy complexion, and of most remarkable taciturnity. So it afterwards happened, Alexander having been murdered in his chamber by his cousin Lorenzo, who corresponded exactly with the above description.⁶⁰ The author of *Hermippus Redivivus*, in relating this story, inclines to the belief that the astrologer was guiltless of any participation in the crime, but was employed by some friend of Prince Alexander to warn him of his danger.

A much more remarkable story is told of an astrologer who lived in Romagna in the fifteenth century, and whose name was Antiochus Tibertus.⁶¹ At that time nearly all the petty sovereigns of Italy retained such men in their service; and Tibertus, having studied the mathematics with great success at Paris, and delivered many predictions, some of which, for guesses, were not deficient in shrewdness, was taken into the household of Pandolfo di Malatesta, the sovereign of Rimini. His reputation was so great, that his study was continually thronged either with visitors who were persons of distinction, or with clients who came to him for advice; and in a

short time he acquired a considerable fortune. Notwithstanding all these advantages, he passed his life miserably, and ended it on the scaffold. The following story afterwards got into circulation, and has been often triumphantly cited by succeeding astrologers as an irrefragable proof of the truth of their science. It was said that, long before he died, he uttered three remarkable prophecies—one relating to himself, another to his friend, and the third to his patron, Pandolfo di Malatesta. The first delivered was that relating to his friend Guido di Bogni, one of the greatest captains of the time. Guido was exceedingly desirous to know his fortune, and so importuned Tibertus, that the latter consulted the stars and the lines on his palm to satisfy him. He afterwards told him with a sorrowful face, that, according to all the rules of astrology and palmistry, he should be falsely suspected by his best friend, and should lose his life in consequence. Guido then asked the astrologer if he could foretell his own fate; upon which Tibertus again consulted the stars, and found that it was decreed from all eternity that he should end his days on the scaffold. Malatesta, when he heard these predictions, so unlikely, to all present appearance, to prove true, desired his astrologer to predict his fate also, and to hide nothing from him, however unfavourable it might be. Tibertus complied, and told his patron, at that time one of the most flourishing and powerful princes of Italy, that he should suffer great want, and die at last like a beggar in the common hospital of Bologna. And so it happened in all three cases. Guido di Bogni was accused by his own father-in-law, the Count di Bentivoglio, of a treasonable design to deliver up the city of Rimini to the papal forces, and was assassinated afterwards, by order of the tyrant Malatesta, as he sat at the supper-table, to which he had been invited in all apparent friendship. The astrologer was at the same time thrown into prison, as being concerned in the treason of his friend. He attempted to escape, and had succeeded in letting himself down from his dungeon-window into a moat, when he was discovered by the sentinels. This being reported to Malatesta, he gave orders for his execution on the following morning.

Malatesta had, at this time, no remembrance of the prophecy; and his own fate gave him no uneasiness; but events were silently working its fulfilment. A conspiracy had been formed, though Guido di Bogni was innocent of it, to deliver up Rimini to the pope; and all the necessary measures having been taken, the city was seized by the Count de Valentinois. In the confusion, Malatesta had barely time to escape from his palace in disguise. He was pursued from place to place by his enemies, abandoned by all his former friends, and, finally, by his own children. He at last fell ill of a languishing disease, at Bologna; and, nobody caring to afford him shelter, he was carried to the hospital, where he died. The only thing that detracts from the interest of this remarkable story is the fact, that the prophecy was made after the event.

For some weeks before the birth of Louis XIV., an astrologer from Germany, who had been sent for by the Marshal de Bassompierre and other noblemen of the court, had taken up his residence in the palace, to be ready, at a moment's notice, to draw the horoscope of the future sovereign of France. When the queen was taken in labour, he was ushered into a contiguous apartment, that he might receive notice of the very instant the child was born. The result of his observations were the three words, *diu, durè, feliciter*; meaning, that the new-born prince should live and reign long, with much labour, and with great glory. No prediction less favourable could have been expected from an astrologer, who had his bread to get, and who was at the same time a courtier. A medal was afterwards struck in commemoration of the event; upon one side of which was figured the nativity of the prince, representing him as driving the chariot of Apollo, with the inscription "Ortus solis Gallici,"—the rising of the Gallic sun.

The best excuse ever made for astrology was that offered by the great astronomer, Kepler, himself an unwilling practiser of the art.

He had many applications from his friends to cast nativities for them, and generally gave a positive refusal to such as he was not afraid of offending by his frankness. In other cases he accommodated himself to the

prevailing delusion. In sending a copy of his *Ephemerides* to Professor Gerlach, he wrote, that *they were nothing but worthless conjectures*; but he was obliged to devote himself to them, or he would have starved. “Ye overwise philosophers,” he exclaimed, in his *Tertius Interveniens*; “ye censure this daughter of astronomy beyond her deserts! *Know ye not that she must support her mother by her charms?* The scanty reward of an astronomer would not provide him with bread, if men did not entertain hopes of reading the future in the heavens.”

NECROMANCY was, next to astrology, the pretended science most resorted to, by those who wished to pry into the future. The earliest instance upon record is that of the witch of Endor and the spirit of Samuel. Nearly all the nations of antiquity believed in the possibility of summoning departed ghosts to disclose the awful secrets that God made clear to the disembodied. Many passages in allusion to this subject will at once suggest themselves to the classical reader; but this art was never carried on openly in any country. All governments looked upon it as a crime of the deepest dye. While astrology was encouraged, and its professors courted and rewarded, necromancers were universally condemned to the stake or the gallows. Roger Bacon, Albertus Magnus, Arnold of Villeneuve, and many others, were accused by the public opinion of many centuries, of meddling in these unhallowed matters. So deep-rooted has always been the popular delusion with respect to accusations of this kind, that no crime was ever disproved with such toil and difficulty. That it met great encouragement, nevertheless, is evident from the vast numbers of pretenders to it; who, in spite of the danger, have existed in all ages and countries.

GEOMANCY, or the art of foretelling the future by means of lines and circles, and other mathematical figures drawn on the earth, is still extensively practised in Asiatic countries, but is almost unknown in Europe.

AUGURY, from the flight or entrails of birds, so favourite a study among the Romans, is, in like manner, exploded in Europe. Its most assiduous professors, at the present day, are the abominable Thugs of India.

DIVINATION, of which there are many kinds, boasts a more enduring reputation. It has held an empire over the minds of men from the earliest periods of recorded history, and is, in all probability, coeval with time itself. It was practised alike by the Jews, the Egyptians, the Chaldeans, the Persians, the Greeks, and the Romans; is equally known to all modern nations, in every part of the world; and is not unfamiliar to the untutored tribes that roam in the wilds of Africa and America. Divination, as practised in civilised Europe at the present day, is chiefly from cards, the tea-cup, and the lines on the palm of the hand. Gipsies alone make a profession of it; but there are thousands and tens of thousands of humble families in which the good-wife, and even the good-man, resort to the grounds at the bottom of their tea-cups, to know whether the next harvest will be abundant, or their sow bring forth a numerous litter; and in which the young maidens look to the same place to know when they are to be married, and whether the man of their choice is to be dark or fair, rich or poor, kind or cruel. Divination by cards, so great a favourite among the moderns, is, of course, a modern science; as cards do not yet boast an antiquity of much more than four hundred years. Divination by the palm, so confidently believed in by half the village lasses in Europe, is of older date, and seems to have been known to the Egyptians in the time of the patriarchs; as well as divination by the cup, which, as we are informed in Genesis, was practised by Joseph. Divination by the rod was also practised by the Egyptians. In comparatively recent times, it was pretended that by this means hidden treasures could be discovered. It now appears to be altogether exploded in Europe. Onomancy, or the foretelling a man's fate by the letters of his name, and the various transpositions of which they are

capable, is a more modern sort of divination; but it reckons comparatively few believers.

The following list of the various species of divination formerly in use, is given by Gaule in his *Magastromancer*, and quoted in Hone's *Year-Book*, p. 1517.

Stereomancy, or divining by the elements.

Aeromancy, or divining by the air.

Pyromancy, by fire,

Hydromancy, by water.

Geomancy, by earth.

Theomancy, pretending to divine by the revelation of the Spirit, and by the Scriptures, or word of God.

Demonomancy, by the aid of devils and evil spirits.

Idolomancy, by idols, images, and figures.

Psychomancy, by the soul, affections, or dispositions of men.

Anthropomancy, by the entrails of human beings.

Theriomancy, by beasts.

Ornithomancy, by birds.

Ichthyomancy, by fishes.

Botanomancy, by herbs.

Lithomancy, by stones.

Kleromancy, by lots.

Oneiromancy, by dreams.

Onomancy, by names.

Arithmancy, by numbers.

Logarithmancy, by logarithms.

Sternomancy, by the marks from the breast to the belly.

Gastromancy, by the sound of, or marks upon the belly.

Omphalomancy, by the navel.
Chiromancy, by the hands.
Podomancy, by the feet.
Onchyomancy, by the nails.
Cephaleonomancy, by asses' heads.
Tephromancy, by ashes.
Kapnomancy, by smoke.
Knissomancy, by the burning of incense.
Ceromancy, by the melting of wax.
Lecanomancy, by basins of water.
Katoptromancy, by looking-glasses.
Chartomancy, by writing in papers, and by Valentines.
Macharomancy, by knives and swords.
Crystallomancy, by crystals.
Dactylomancy, by rings.
Koskinomancy, by sieves.
Axinomancy, by saws.
Chalcomancy, by vessels of brass, or other metal.
Spatilomancy, by skins, bones, &c.
Astromancy, by stars.
Sciomancy, by shadows.
Astragalomancy, by dice.
Oinomancy, by the lees of wine.
Sycomancy, by figs.
Tyromancy, by cheese.
Alphitomancy, by meal, flour, or bran.
Krithomancy, by corn or grain.
Alectromancy, by cocks.
Gyromancy, by circles.

Lampadomancy, by candles and lamps.

ONEIRO-CRITICISM, or the art of interpreting dreams, is a relic of the most remote ages, which has subsisted through all the changes that moral or physical revolutions have operated in the world. The records of five thousand years bear abundant testimony to the universal diffusion of the belief, that the skilful could read the future in dreams. The rules of the art, if any existed in ancient times, are not known; but in our day, one simple rule opens the whole secret. Dreams, say all the wiseacres in Christendom, are to be interpreted by contraries. Thus, if you dream of filth, you will acquire something valuable; if you dream of the dead, you will hear news of the living; if you dream of gold and silver, you run a risk of being without either; and if you dream you have many friends, you will be persecuted by many enemies. The rule, however, does not hold good in all cases. It is fortunate to dream of little pigs, but unfortunate to dream of big bullocks. If you dream you have lost a tooth, you may be sure that you will shortly lose a friend; and if you dream that your house is on fire, you will receive news from a far country. If you dream of vermin, it is a sign that there will be sickness in your family; and if you dream of serpents, you will have friends who, in the course of time, will prove your bitterest enemies; but, of all dreams, it is most fortunate if you dream that you are wallowing up to your neck in mud and mire. Clear water is a sign of grief; and great troubles, distress, and perplexity are predicted, if you dream that you stand naked in the public streets, and know not where to find a garment to shield you from the gaze of the multitude.

In many parts of Great Britain, and the continents of Europe and America, there are to be found elderly women in the villages and country-places whose interpretations of dreams are looked upon with as much reverence as if they were oracles. In districts remote from towns it is not uncommon to find the members of a family regularly every morning narrating their dreams at the breakfast-table, and becoming happy or

miserable for the day according to their interpretation. There is not a flower that blossoms, or fruit that ripens, that, dreamed of, is not ominous of either good or evil to such people. Every tree of the field or the forest is endowed with a similar influence over the fate of mortals, if seen in the night-visions. To dream of the ash, is the sign of a long journey; and of an oak, prognosticates long life and prosperity. To dream you strip the bark off any tree, is a sign to a maiden of an approaching loss of a character; to a married woman, of a family bereavement; and to a man, of an accession of fortune. To dream of a leafless tree, is a sign of great sorrow; and of a branchless trunk, a sign of despair and suicide. The elder-tree is more auspicious to the sleeper; while the fir-tree, better still, betokens all manner of comfort and prosperity. The lime-tree predicts a voyage across the ocean; while the yew and the alder are ominous of sickness to the young and of death to the old.⁶² Among the flowers and fruits charged with messages for the future, the following is a list of the most important, arranged from approved sources, in alphabetical order:

Asparagus, gathered and tied up in bundles, is an omen of tears. If you see it growing in your dreams, it is a sign of good fortune.

Aloes, without a flower, betokens long life; in flower, betokens a legacy.

Artichokes. This vegetable is a sign that you will receive, in a short time, a favour from the hands of those from whom you would least expect it.

Agrimony. This herb denotes that there will be sickness in your house.

Anemone predicts love.

Auriculas, in beds, denote luck; in pots, marriage; while to gather them, foretells widowhood.

Bilberries predict a pleasant excursion.

Broom-flowers an increase of family.

Cauliflowers predict that all your friends will slight you, or that you will fall into poverty and find no one to pity you.

Dock-leaves, a present from the country.

Daffodils. Any maiden who dreams of daffodils is warned by her good angel to avoid going into a wood with her lover, or into any dark or retired place where she might not be able to make people hear her if she cried out. Alas for her if she pay no attention to the warning!

“Never again shall she put garland on;
Instead of it she’ll wear sad cypress now,
And bitter elder broken from the bough.”

Figs, if green, betoken embarrassment; if dried, money to the poor, and mirth to the rich.

Hearts-ease betokens heart’s pain.

Lilies predict joy; *water-lilies*, danger from the sea.

Lemons betoken a separation.

Pomegranates predict happy wedlock to those who are single, and reconciliation to those who are married and have disagreed.

Quinces prognosticate pleasant company.

Roses denote happy love, not unmixed with sorrow from other sources.

Sorrel. To dream of this herb is a sign that you will shortly have occasion to exert all your prudence to overcome some great calamity.

Sunflowers shew that your pride will be deeply wounded.

Violets predict evil to the single, and joy to the married.

Yellow-flowers of any kind predict jealousy.

Yew-berries predict loss of character to both sexes.

It should be observed that the rules for the interpretation of dreams are far from being universal. The cheeks of the peasant girl of England glow with pleasure in the morning after she has dreamed of a rose, while the *paysanne* of Normandy dreads disappointment and vexation for the very

same reason. The Switzer who dreams of an oak-tree does not share in the Englishman's joy; for he imagines that the vision was a warning to him that, from some trifling cause, an overwhelming calamity will burst over him. Thus do the ignorant and the credulous torment themselves; thus do they spread their nets to catch vexation, and pass their lives between hopes which are of no value and fears which are a positive evil.

OMENS. Among the other means of self-annoyance upon which men have stumbled, in their vain hope of discovering the future, signs and omens hold a conspicuous place. There is scarcely an occurrence in nature which, happening at a certain time, is not looked upon by some persons as a prognosticator either of good or evil. The latter are in the greatest number, so much more ingenious are we in tormenting ourselves than in discovering reasons for enjoyment in the things that surround us. We go out of our course to make ourselves uncomfortable; the cup of life is not bitter enough to our palate, and we distil superfluous poison to put into it, or conjure up hideous things to frighten ourselves at, which would never exist if we did not make them. "We suffer," says Addison,⁶³ "as much from trifling accidents as from real evils. I have known the shooting of a star spoil a night's rest, and have seen a man in love grow pale and lose his appetite upon the plucking of a merrythought. A screech-owl at midnight has alarmed a family more than a band of robbers; nay, the voice of a cricket has struck more terror than the roaring of a lion. There is nothing so inconsiderable which may not appear dreadful to an imagination that is filled with omens and prognostics. A rusty nail or a crooked pin shoot up into prodigies."

The century and a quarter that has passed away since Addison wrote has seen the fall of many errors. Many fallacies and delusions have been crushed under the foot of Time since then; but this has been left unscathed, to frighten the weak-minded and embitter their existence. A belief in omens is not confined to the humble and uninformed. A general who led an

army with credit has been known to feel alarmed at a winding-sheet in the candle; and learned men, who had honourably and fairly earned the highest honours of literature, have been seen to gather their little ones around them, and fear that one would be snatched away, because,

“When stole upon the time the dead of night,
And heavy sleep had closed up mortal eyes,”

a dog in the street was howling at the moon. Persons who would acknowledge freely that the belief in omens was unworthy of a man of sense, have yet confessed at the same time that, in spite of their reason, they have been unable to conquer their fears of death when they heard the harmless insect called the death-watch ticking in the wall, or saw an oblong hollow coal fly out of the fire.

Many other evil omens besides those mentioned above alarm the vulgar and the weak. If a sudden shivering comes over such people, they believe that, at that instant, an enemy is treading over the spot that will one day be their grave. If they meet a sow when they first walk abroad in the morning, it is an omen of evil for that day. To meet an ass, is in like manner unlucky. It is also very unfortunate to walk under a ladder; to forget to eat goose on the festival of St. Michael; to tread upon a beetle, or to eat the twin nuts that are sometimes found in one shell. Woe, in like manner, is predicted to that wight who inadvertently upsets the salt; each grain that is overthrown will bring to him a day of sorrow. If thirteen persons sit at table, one of them will die within the year; and all of them will be unhappy. Of all evil omens this is the worst. The facetious Dr. Kitchener used to observe that there was one case in which he believed that it was really unlucky for thirteen persons to sit down to dinner, and that was when there was only dinner enough for twelve. Unfortunately for their peace of mind, the great majority of people do not take this wise view of the matter. In almost every

country of Europe the same superstition prevails, and some carry it so far as to look upon the number thirteen as in every way ominous of evil; and if they find thirteen coins in their purse, cast away the odd one like a polluted thing. The philosophic Beranger, in his exquisite song, *Thirteen at Table*, has taken a poetical view of this humiliating superstition, and mingled, as is his wont, a lesson of genuine wisdom in his lay. Being at dinner, he overthrows the salt, and, looking round the room, discovers that he is the thirteenth guest. While he is mourning his unhappy fate, and conjuring up visions of disease and suffering and the grave, he is suddenly startled by the apparition of Death herself, not in the shape of a grim foe, with skeleton-ribs and menacing dart, but of an angel of light, who shews the folly of tormenting ourselves with the dread of her approach, when she is the friend, rather than the enemy, of man, and frees us from the fetters which bind us to the dust.

If men could bring themselves to look upon death in this manner, living well and wisely till her inevitable approach, how vast a store of grief and vexation would they spare themselves!

Among good omens, one of the most conspicuous is to meet a piebald horse. To meet two of these animals is still more fortunate; and if on such an occasion you spit thrice, and form any reasonable wish, it will be gratified within three days. It is also a sign of good fortune if you inadvertently put on your stocking wrong side out. If you wilfully wear your stocking in this fashion, no good will come of it. It is very lucky to sneeze twice; but if you sneeze a third time, the omen loses its power, and your good fortune will be nipped in the bud. If a strange dog follow you, and fawn on you, and wish to attach itself to you, it is a sign of very great prosperity. Just as fortunate is it if a strange male cat comes to your house and manifests friendly intentions towards your family. If a she cat, it is an omen, on the contrary, of very great misfortune. If a swarm of bees alight in your garden, some very high honour and great joys await you.

Besides these glimpses of the future, you may know something of your fate by a diligent attention to every itching that you may feel in your body. Thus, if the eye or the nose itches, it is a sign you will be shortly vexed; if the foot itches, you will tread upon strange ground; and if the elbow itches, you will change your bedfellow. Itching of the right hand prognosticates that you will soon have a sum of money; and, of the left, that you will be called upon to disburse it.

These are but a few of the omens which are generally credited in modern Europe. A complete list of them would fatigue from its length, and sicken from its absurdity. It would be still more unprofitable to attempt to specify the various delusions of the same kind which are believed among oriental nations. Every reader will remember the comprehensive formula of cursing preserved in *Tristram Shandy*—curse a man after any fashion you remember or can invent, you will be sure to find it there. The oriental creed of omens is not less comprehensive. Every movement of the body, every emotion of the mind, is at certain times an omen. Every form and object in nature, even the shape of the clouds and the changes of the weather; every colour, every sound, whether of men or animals, or birds or insects, or inanimate things, is an omen. Nothing is too trifling or inconsiderable to inspire a hope which is not worth cherishing, or a fear which is sufficient to embitter existence.

From the belief in omens springs the superstition that has, from very early ages, set apart certain days, as more favourable than others, for prying into the secrets of futurity. The following, copied verbatim from the popular *Dream and Omen Book* of Mother Bridget, will shew the belief of the people of England at the present day. Those who are curious as to the ancient history of these observances, will find abundant aliment in the *Every-day Book*.

“*The 1st of January.*—If a young maiden drink, on going to bed, a pint of cold spring water, in which is beat up an amulet, composed of

the yolk of a pullet's egg, the legs of a spider, and the skin of an eel pounded, her future destiny will be revealed to her in a dream. This charm fails of its effect if tried any other day of the year.

“Valentine Day.—Let a single woman go out of her own door very early in the morning, and if the first person she meets be a woman, she will not be married that year; if she meet a man she will be married within three months.

“Lady Day.—The following charm may be tried this day with certain success: String thirty-one nuts on a string, composed of red worsted mixed with blue silk, and tie it round your neck on going to bed, repeating these lines:

“Oh, I wish! oh, I wish to see
Who my true love is to be!

Shortly after midnight, you will see your lover in a dream, and be informed at the same time of all the principal events of your future life.

“St. Swithin's Eve.—Select three things you most wish to know; write them down with a new pen and red ink on a sheet of fine wove paper, from which you must previously cut off all the corners and burn them. Fold the paper into a true lover's knot, and wrap round it three hairs from your head. Place the paper under your pillow for three successive nights, and your curiosity to know the future will be satisfied.

“St. Mark's Eve.—Repair to the nearest churchyard as the clock strikes twelve, and take from a grave on the south side of the church three tufts of grass (the longer and ranker the better), and on going to bed place them under your pillow, repeating earnestly three several times,

‘The Eve of St. Mark by prediction is blest,
Set therefore my hopes and my fears all to rest:
Let me know my fate, whether weal or woe;
Whether my rank’s to be high or low;
Whether to live single, or be a bride,
And the destiny my star doth provide.’

Should you have no dream that night, you will be single and miserable all your life. If you dream of thunder and lightning, your life will be one of great difficulty and sorrow.

“*Candlemas Eve.*—On this night (which is the purification of the Virgin Mary), let three, five, seven, or nine young maidens assemble together in a square chamber. Hang in each corner a bundle of sweet herbs, mixed with rue and rosemary. Then mix a cake of flour, olive-oil, and white sugar; every maiden having an equal share in the making and the expense of it. Afterwards it must be cut into equal pieces, each one marking the piece as she cuts it with the initials of her name. It is then to be baked one hour before the fire, not a word being spoken the whole time, and the maidens sitting with their arms and knees across. Each piece of cake is then to be wrapped up in a sheet of paper, on which each maiden shall write the love part of Solomon’s Songs. If she put this under her pillow she will dream true. She will see her future husband and every one of her children, and will know besides whether her family will be poor or prosperous, a comfort to her or the contrary.

“*Midsummer.*—Take three roses, smoke them with sulphur, and exactly at three in the day bury one of the roses under a yew-tree; the second in a newly-made grave, and put the third under your pillow for three nights, and at the end of that period burn it in a fire of charcoal. Your dreams during that time will be prophetic of your future destiny,

and, what is still more curious and valuable, says Mother Bridget, the man whom you are to wed will enjoy no peace till he comes and visits you. Besides this, you will perpetually haunt his dreams.

“*St. John’s Eve.*—Make a new pincushion of the very best black velvet (no inferior quality will answer the purpose), and on one side stick your name at full length with the very smallest pins that can be bought (none other will do). On the other side make a cross with some very large pins, and surround it with a circle. Put this into your stocking when you take it off at night, and hang it up at the foot of the bed. All your future life will pass before you in a dream.

“*First New Moon of the year.*—On the first new moon in the year take a pint of clear spring water, and infuse into it the *white* of an egg laid by a *white* hen, a glass of *white* wine, three almonds peeled *white*, and a tablespoonful of *white* rose-water. Drink this on going to bed, not making more nor less than three draughts of it; repeating the following verses three several times in a clear distinct voice, but not so loud as to be overheard by any body:

‘If I dream of water pure
 Before the coming morn,
’Tis a sign I shall be poor,
 And unto wealth not born.
If I dream of tasting beer,
Middling then will be my cheer—
Chequer’d with the good and bad,
Sometimes joyful, sometimes sad;
But should I dream of drinking wine,
Wealth and pleasure will be mine.
The stronger the drink, the better the cheer—
Dreams of my destiny, appear, appear!’

“Twenty-ninth of February.—This day, as it only occurs once in four years, is peculiarly auspicious to those who desire to have a glance at futurity, especially to young maidens burning with anxiety to know the appearance and complexion of their future lords. The charm to be adopted is the following: Stick twenty-seven of the smallest pins that are made, three by three, into a tallow candle. Light it up at the wrong end, and then place it in a candlestick made out of clay, which must be drawn from a virgin’s grave. Place this on the chimney-place, in the left-hand corner, exactly as the clock strikes twelve, and go to bed immediately. When the candle is burnt out, take the pins and put them into your left shoe; and before nine nights have elapsed your fate will be revealed to you.”

We have now taken a hasty review of the various modes of seeking to discover the future, especially as practised in modern times. The main features of the folly appear essentially the same in all countries. National character and peculiarities operate some difference of interpretation. The mountaineer makes the natural phenomena which he most frequently witnesses prognosticative of the future. The dweller in the plains, in a similar manner, seeks to know his fate among the signs of the things that surround him, and tints his superstition with the hues of his own clime. The same spirit animates them all—the same desire to know that which Infinite Mercy has concealed. There is but little probability that the curiosity of mankind in this respect will ever be wholly eradicated. Death and ill fortune are continual bugbears to the weak-minded, the irreligious, and the ignorant; and while such exist in the world, divines will preach upon its impiety and philosophers discourse upon its absurdity in vain. Still it is evident that these follies have greatly diminished. Soothsayers and prophets have lost the credit they formerly enjoyed, and skulk in secret now where they once shewed their faces in the blaze of day. So far there is manifest improvement.

THE MAGNETISERS.

Some deemed them wondrous wise, and some believed them mad.

Beattie's Minstrel.



THE wonderful influence of imagination in the cure of diseases is well known. A motion of the hand, or a glance of the eye, will throw a weak and credulous patient into a fit; and a pill made of bread, if taken with sufficient faith, will operate a cure better than all the drugs in the pharmacopœia. The Prince of Orange, at the siege of Breda, in 1625, cured all his soldiers, who were dying of the scurvy, by a philanthropic piece of quackery, which he played upon them with the knowledge of the physicians, when all other means had failed.⁶⁴ Many hundreds of instances, of a similar kind, might be related, especially from the history of witchcraft. The mummeries, strange gesticulations, and barbarous jargon of witches and sorcerers, which frightened credulous and nervous women, brought on all those symptoms of hysteria and other similar diseases, so well understood now, but which were then supposed to be the work of the Devil,

not only by the victims and the public in general, but by the operators themselves.

In the age when alchymy began to fall into some disrepute, and learning to lift up its voice against it, a new delusion, based upon this power of imagination, suddenly arose, and found apostles among all the alchymists. Numbers of them, forsaking their old pursuits, made themselves magnetisers. It appeared first in the shape of mineral, and afterwards of animal, magnetism, under which latter name it survives to this day, and numbers its dupes by thousands.

The mineral magnetisers claim the first notice, as the worthy predecessors of the quacks of the present day. The honour claimed for Paracelsus, of being the first of the Rosicrucians, has been disputed; but his claim to be considered the first of the magnetisers can scarcely be challenged. It has been already mentioned of him, in the part of this work which treats of alchymy, that, like nearly all the distinguished adepts, he was a physician; and pretended, not only to make gold and confer immortality, but to cure all diseases. He was the first who, with the latter view, attributed occult and miraculous powers to the magnet. Animated apparently by a sincere conviction that the magnet was the philosopher's stone, which, if it could not transmute metals, could soothe all human suffering and arrest the progress of decay, he travelled for many years in Persia and Arabia, in search of the mountain of adamant, so famed in oriental fables. When he practised as a physician at Basle, he called one of his nostrums by the name of azoth—a stone or crystal, which, he said, contained magnetic properties, and cured epilepsy, hysteria, and spasmodic affections. He soon found imitators. His fame spread far and near; and thus were sown the first seeds of that error which has since taken root and flourished so widely. In spite of the denial of modern practitioners, this must be considered the origin of magnetism; for we find that, beginning with Paracelsus, there was a regular succession of mineral

magnetisers until Mesmer appeared, and gave a new feature to the delusion.

Paracelsus boasted of being able to *transplant* diseases from the human frame into the earth, by means of the magnet. He said there were six ways by which this might be effected. One of them will be quite sufficient as a specimen. “If a person suffer from disease, either local or general, let the following remedy be tried. Take a magnet, impregnated with mummy,⁶⁵ and mixed with rich earth. In this earth sow some seeds that have a congruity or homogeneity with the disease; then let this earth, well sifted and mixed with mummy, be laid in an earthen vessel; and let the seeds committed to it be watered daily with a lotion in which the diseased limb or body has been washed. Thus will the disease be transplanted from the human body to the seeds which are in the earth. Having done this, transplant the seeds from the earthen vessel to the ground, and wait till they begin to sprout into herbs; as they increase, the disease will diminish; and when they have arrived at their full growth, it will disappear altogether.”

Kircher the Jesuit, whose quarrel with the alchemists was the means of exposing many of their impostures, was a firm believer in the efficacy of the magnet. Having been applied to by a patient afflicted with hernia, he directed the man to swallow a small magnet reduced to powder, while he applied at the same time to the external swelling, a poultice made of filings of iron. He expected that by this means the magnet, when it got to the corresponding place inside, would draw in the iron, and with it the tumour; which would thus, he said, be safely and expeditiously reduced.

As this new doctrine of magnetism spread, it was found that wounds inflicted with any metallic substance could be cured by the magnet. In process of time, the delusion so increased, that it was deemed sufficient to magnetise a sword, to cure any hurt which that sword might have inflicted! This was the origin of the celebrated “weapon-salve,” which excited so much attention about the middle of the seventeenth century. The following

was the recipe given by Paracelsus for the cure of any wounds inflicted by a sharp weapon, except such as had penetrated the heart, the brain, or the arteries. “Take of moss growing on the head of a thief who has been hanged and left in the air; of real mummy; of human blood, still warm—of each, one ounce; of human suet, two ounces; of linseed oil, turpentine, and Armenian bole—of each, two drachms. Mix all well in a mortar, and keep the salve in an oblong, narrow urn.” With this salve the weapon, after being dipped in the blood from the wound, was to be carefully anointed, and then laid by in a cool place. In the mean time, the wound was to be duly washed with fair clean water, covered with a clean, soft, linen rag, and opened once a day to cleanse off purulent or other matter. Of the success of this treatment, says the writer of the able article on Animal Magnetism, in the twelfth volume of the *Foreign Quarterly Review*, there cannot be the least doubt; “for surgeons at this moment follow exactly the same method, *except* anointing the weapon!”

The weapon-salve continued to be much spoken of on the Continent, and many eager claimants appeared for the honour of the invention. Dr. Fludd, or A. Fluctibus, the Rosicrucian, who has been already mentioned in a previous part of this volume, was very zealous in introducing it into England. He tried it with great success in several cases, and no wonder, for while he kept up the spirits of his patients by boasting of the great efficacy of the salve, he never neglected those common, but much more important remedies, of washing, bandaging, &c. which the experience of all ages had declared sufficient for the purpose. Fludd moreover declared, that the magnet was a remedy for all diseases, if properly applied; but that man having, like the earth, a north and a south pole, magnetism could only take place when his body was in a boreal position! In the midst of his popularity, an attack was made upon him and his favourite remedy, the salve; which, however, did little or nothing to diminish the belief in its efficacy. One “Parson Foster” wrote a pamphlet, entitled *Hypocrisma Spongus; or, a Spunge to wipe away the Weapon-Salve*; in which he

declared, that it was as bad as witchcraft to use or recommend such an unguent; that it was invented by the Devil, who, at the last day, would seize upon every person who had given it the slightest encouragement. "In fact," said Parson Foster, "the Devil himself gave it to Paracelsus; Paracelsus to the emperor; the emperor to the courtier; the courtier to Baptista Porta; and Baptista Porta to Dr. Fludd, a doctor of physic, yet living and practising in the famous city of London, who now stands tooth and nail for it." Dr. Fludd, thus assailed, took up the pen in defence of his unguent, in a reply called *The Squeezing of Parson Foster's Sponge; wherein the Sponge-bearer's immodest carriage and behaviour towards his brethren is detected; the bitter flames of his slanderous reports are, by the sharp vinegar of truth, corrected and quite extinguished; and lastly, the virtuous validity of his sponge in wiping away the-weapon-salve, is crushed out and clean abolished.*

Shortly after this dispute a more distinguished believer in the weapon-salve made his appearance in the person of Sir Kenelm Digby, the son of Sir Everard Digby, who was executed for his participation in the Gunpowder Plot. This gentleman, who, in other respects, was an accomplished scholar and an able man, was imbued with all the extravagant notions of the alchymists. He believed in the philosopher's stone, and wished to engage Descartes to devote his energies to the discovery of the elixir of life, or some other means by which the existence of man might be prolonged to an indefinite period. He gave his wife, the beautiful Venetia Anastasia Stanley, a dish of capons fed upon vipers, according to the plan supposed to have been laid down by Arnold of Villeneuve, in the hope that she might thereby preserve her loveliness for a century. If such a man once took up the idea of the weapon-salve, it was to be expected that he would make the most of it. In his hands, however, it was changed from an unguent into a powder, and was called the *powder of sympathy*. He pretended that he had acquired the knowledge of it from a Carmelite friar, who had learned it in Persia or Armenia, from an oriental

philosopher of great renown. King James, the Prince of Wales, the Duke of Buchingham, and many other noble personages, believed in its efficacy. The following remarkable instance of his mode of cure was read by Sir Kenelm to a society of learned men at Montpellier. Mr. James Howell, the well-known author of the *Dendrologia*, and of various letters, coming by chance as two of his best friends were fighting a duel, rushed between them and endeavoured to part them. He seized the sword of one of the combatants by the hilt, while, at the same time, he grasped the other by the blade. Being transported with fury one against the other, they struggled to rid themselves of the hindrance caused by their friend; and in so doing, the one whose sword was held by the blade by Mr. Howell, drew it away roughly, and nearly cut his hand off, severing the nerves and muscles, and penetrating to the bone. The other, almost at the same instant, disengaged his sword, and aimed a blow at the head of his antagonist, which Mr. Howell observing, raised his wounded hand with the rapidity of thought to prevent the blow. The sword fell on the back of his already wounded hand, and cut it severely. "It seemed," said Sir Kenelm Digby, "as if some unlucky star raged over them, that they should have both shed the blood of that dear friend for whose life they would have given their own, if they had been in their proper mind at the time." Seeing Mr. Howell's face all besmeared with blood from his wounded hand, they both threw down their swords and embraced him, and bound up his hand with a garter, to close the veins which were cut and bled profusely. They then conveyed him home, and sent for a surgeon. King James, who was much attached to Mr. Howell, afterwards sent his own surgeon to attend him. We must continue the narrative in the words of Sir Kenelm Digby: "It was my chance," says he, "to be lodged hard by him; and four or five days after, as I was making myself ready, he came to my house, and prayed me to view his wounds. 'For I understand,' said he, 'that you have extraordinary remedies on such occasions; and my surgeons apprehend some fear that it may grow to a gangrene, and so the hand must be cut off.' In effect, his countenance

discovered that he was in much pain, which, he said, was insupportable in regard of the extreme inflammation. I told him I would willingly serve him; but if, haply, he knew the manner how I could cure him, without touching or seeing him, it might be that he would not expose himself to my manner of curing; because he would think it, peradventure, either ineffectual or superstitious. He replied, ‘The many wonderful things which people have related unto me of your way of medicinement makes me nothing doubt at all of its efficacy; and all that I have to say unto you is comprehended in the Spanish proverb, *Hagase el milagro y hagalo Mahoma*—Let the miracle be done, though Mahomet do it.’

“I asked him then for any thing that had the blood upon it: so he presently sent for his garter, wherewith his hand was first bound; and as I called for a basin of water, as if I would wash my hands, I took a handful of powder of vitriol, which I had in my study, and presently dissolved it. As soon as the bloody garter was brought me, I put it in the basin, observing, in the interim, what Mr. Howell did, who stood talking with a gentleman in a corner of my chamber, not regarding at all what I was doing. He started suddenly, as if he had found some strange alteration in himself. I asked him what he ailed? ‘I know not what ails me, but I find that I feel no more pain. Methinks that a pleasing kind of freshness, as it were a wet cold napkin, did spread over my hand, which hath taken away the inflammation that tormented me before.’ I replied, ‘Since, then, you feel already so much good of my medicament, I advise you to cast away all your plasters; only keep the wound clean, and in a moderate temper betwixt heat and cold.’ This was presently reported to the Duke of Buckingham, and, a little after, to the king, who were both very curious to know the circumstances of the business; which was, that after dinner I took the garter out of the water, and put it to dry before a great fire. It was scarce dry before Mr. Howell’s servant came running, and saying that

his master felt as much burning as ever he had done, if not more; for the heat was such as if his hand were betwixt coals of fire. I answered that, although that had happened at present, yet he should find ease in a short time; for I knew the reason of this new accident, and would provide accordingly; for his master should be free from that inflammation, it might be before he could possibly return to him. But, in case he found no ease, I wished him to come presently back again; if not, he might forbear coming. Thereupon he went, and, at the instant I did put the garter again into the water; thereupon he found his master without any pain at all. To be brief, there was no cense of pain afterwards; but within five or six days the wounds were sicatrised and entirely healed.”

Such is the marvellous story of Sir Kenelm Digby. Other practitioners of that age were not behind him in their pretensions. It was not always thought necessary to use either the powder of sympathy, or the weapon-salve, to effect a cure. It was sufficient to magnetise the sword with the hand (the first faint dawn of the *animal* theory), to relieve any pain the same weapon had caused. They asserted, that if they stroked the sword *upwards* with their fingers, the wounded person would feel immediate relief; but if they stroked it *downwards*, he would feel intolerable pain.⁶⁶

Another very singular notion of the power and capabilities of magnetism was entertained at the same time. It was believed that a *sympathetic alphabet* could be made on the flesh, by means of which persons could correspond with each other, and communicate all their ideas with the rapidity of volition, although thousands of miles apart. From the arms of two persons a piece of flesh was cut, and mutually transplanted, while still warm and bleeding. The piece so severed grew to the new arm on which it was placed; but still retained so close a sympathy with its native limb, that its old possessor was always sensible of any injury done to it. Upon these transplanted pieces were tatoood the letters of the alphabet; so that, when a

communication was to be made, either of the persons, though the wide Atlantic rolled between them, had only to prick his arm with a magnetic needle, and straightway his friend received intimation that the telegraph was at work. Whatever letter he pricked on his own arm pained the same letter on the arm of his correspondent.

Contemporary with Sir Kenelm Digby was the no less famous Mr. Valentine Greatraks, who, without mentioning magnetism, or laying claim to any theory, practised upon himself and others a deception much more akin to the animal magnetism of the present day than the mineral magnetism it was then so much the fashion to study. He was the son of an Irish gentleman, of good education and property, in the county of Cork. He fell, at an early age, into a sort of melancholy derangement. After some time he had an impulse, or strange persuasion in his mind, which continued to present itself, whether he were sleeping or waking, that God had given him the power of curing the king's evil. He mentioned this persuasion to his wife, who very candidly told him that he was a fool. He was not quite sure of this, notwithstanding the high authority from which it came, and determined to make trial of the power that was in him. A few days afterwards, he went to one William Maher, of Saltersbridge, in the parish of Lismore, who was grievously afflicted with the king's evil in his eyes, cheek, and throat. Upon this man, who was of abundant faith, he laid his hands, stroked him, and prayed fervently. He had the satisfaction to see him heal considerably in the course of a few days; and finally, with the aid of other remedies, to be quite cured. This success encouraged him in the belief that he had a divine mission. Day after day he had further impulses from on high that he was called upon to cure the ague also. In the course of time he extended his powers to the curing of epilepsy, ulcers, aches, and lameness. All the county of Cork was in a commotion to see this extraordinary physician, who certainly operated some very great benefit in cases where the disease was heightened by hypochondria and depression of spirits. According to his own account,⁶⁷ such great multitudes resorted to

him from divers places, that he had no time to follow his own business, or enjoy the company of his family and friends. He was obliged to set aside three days in the week, from six in the morning till six at night, during which time only he laid hands upon all that came. Still the crowds which thronged around him were so great, that the neighbouring towns were not able to accommodate them. He thereupon left his house in the country, and went to Youghal, where the resort of sick people, not only from all parts of Ireland, but from England, continued so great, that the magistrates were afraid they would infect the place by their diseases. Several of these poor credulous people no sooner saw him than they fell into fits, and he restored them by waving his hand in their faces, and praying over them. Nay, he affirmed that the touch of his glove had driven pains away, and, on one occasion, cast out from a woman several devils, or evil spirits, who tormented her day and night. "Every one of these devils," says Greatraks, "was like to choke her when it came up into her throat." It is evident from this that the woman's complaint was nothing but hysteria.

The clergy of the diocese of Lismore, who seem to have had much clearer notions of Greatraks' pretensions than their parishioners, set their faces against the new prophet and worker of miracles. He was cited to appear in the Dean's Court, and prohibited from laying on his hands for the future: but he cared nothing for the Church. He imagined that he derived his powers direct from heaven, and continued to throw people into fits, and bring them to their senses again, as usual, almost exactly after the fashion of modern magnetisers. His reputation became, at last, so great, that Lord Conway sent to him from London, begging that he would come over immediately to cure a grievous headache which his lady had suffered for several years, and which the principal physicians of England had been unable to relieve.

Greatraks accepted the invitation, and tried his manipulations and prayers upon Lady Conway. He failed, however, in affording any relief. The poor lady's headache was excited by causes too serious to allow her any

help, even from faith and a lively imagination. He lived for some months in Lord Conway's house, at Ragley, in Warwickshire, operating cures similar to those he had performed in Ireland. He afterwards removed to London, and took a house in Lincoln's-Inn Fields, which soon became the daily resort of all the nervous and credulous women of the metropolis. A very amusing account of Greatraks at this time (1665) is given in the second volume of the *Miscellanies of St. Evremond*, under the title of the Irish prophet. It is the most graphic sketch ever made of this early magnetiser. Whether his pretensions were more or less absurd than those of some of his successors, who have lately made their appearance among us, would be hard to say.

“When M. de Comminges,” says St. Evremond, “was ambassador from his most Christian majesty to the king of Great Britain, there came to London an Irish prophet, who passed himself off as a great worker of miracles. Some persons of quality having begged M. de Comminges to invite him to his house, that they might be witnesses of some of his miracles, the ambassador promised to satisfy them, as much to gratify his own curiosity as from courtesy to his friends; and gave notice to Greatraks that he would be glad to see him.

“A rumour of the prophet's coming soon spread all over the town, and the hotel of M. de Comminges was crowded by sick persons, who came full of confidence in their speedy cure. The Irishman made them wait a considerable time for him, but came at last, in the midst of their impatience, with a grave and simple countenance, that showed no signs of his being a cheat. Monsieur de Comminges prepared to question him strictly, hoping to discourse with him on the matters that he had read of in Van Helmont and Bodinus; but he was not able to do so, much to his regret, for the crowd became so great, and cripples and others pressed around so impatiently to be the first cured, that the

servants were obliged to use threats, and even force, before they could establish order among them, or place them in proper ranks.

“The prophet affirmed that all diseases were caused by evil spirits. Every infirmity was with him a case of diabolical possession. The first that was presented to him was a man suffering from gout and rheumatism, and so severely that the physicians had been unable to cure him. ‘Ah,’ said the miracle-worker, ‘I have seen a good deal of this sort of spirits when I was in Ireland. They are watery spirits, who bring on cold shivering, and excite an overflow of aqueous humours in our poor bodies.’ Then addressing the man, he said, ‘Evil spirit, who hast quitted thy dwelling in the waters to come and afflict this miserable body, I command thee to quit thy new abode, and to return to thine ancient habitation!’ This said, the sick man was ordered to withdraw, and another was brought forward in his place. This new comer said he was tormented by the melancholy vapours. In fact, he looked like a hypochondriac; one of those persons, diseased in imagination, and who but too often become so in reality. ‘Aerial spirit,’ said the Irishman, ‘return, I command thee, into the air;—exercise thy natural vocation of raising tempests, and do not excite any more wind in this sad unlucky body!’ This man was immediately turned away to make room for a third patient, who, in the Irishman’s opinion, was only tormented by a little bit of a sprite, who could not withstand his command for an instant. He pretended that he recognised this sprite by some marks which were invisible to the company, to whom he turned with a smile, and said, ‘This sort of spirit does not often do much harm, and is always very diverting.’ To hear him talk, one would have imagined that he knew all about spirits,—their names, their rank, their numbers, their employment, and all the functions they were destined to; and he boasted of being much better acquainted with the intrigues of demons than he was with the affairs of men. You can hardly imagine what a reputation he gained in a short time. Catholics

and Protestants visited him from every part, all believing that power from heaven was in his hands.”

After relating a rather equivocal adventure of a husband and wife, who implored Greatraks to cast out the devil of dissension which had crept in between them, St. Evremond thus sums up the effect he produced on the popular mind: “So great was the confidence in him, that the blind fancied they saw the light which they did not see—the deaf imagined that they heard—the lame that they walked straight, and the paralytic that they had recovered the use of their limbs. An idea of health made the sick forget for a while their maladies; and imagination, which was not less active in those merely drawn by curiosity than in the sick, gave a false view to the one class, from the desire of seeing, as it operated a false cure on the other from the strong desire of being healed. Such was the power of the Irishman over the mind, and such was the influence of the mind upon the body. Nothing was spoken of in London but his prodigies; and these prodigies were supported by such great authorities, that the bewildered multitude believed them almost without examination, while more enlightened people did not dare to reject them from their own knowledge. The public opinion, timid and enslaved, respected this imperious and, apparently, well-authenticated error. Those who saw through the delusion kept their opinion to themselves, knowing how useless it was to declare their disbelief to a people filled with prejudice and admiration.”

About the same time that Valentine Greatraks was thus *magnetising* the people of London, an Italian enthusiast, named Francisco Bagnone, was performing the same tricks in Italy, and with as great success. He had only to touch weak women with his hands, or sometimes (for the sake of working more effectively upon their fanaticism) with a relic, to make them fall into fits, and manifest all the symptoms of magnetism.

Besides these, several learned men, in different parts of Europe, directed their attention to the study of the magnet, believing that it might be

rendered efficacious in many diseases. Van Helmont, in particular, published a work on the effects of magnetism on the human frame; and Balthazar Gracian, a Spaniard, rendered himself famous for the boldness of his views on the subject. “The magnet,” said the latter, “attracts iron; iron is found every where; every thing, therefore, is under the influence of magnetism. It is only a modification of the general principle, which establishes harmony or foments divisions among men. It is the same agent that gives rise to sympathy, antipathy, and the passions.”⁶⁸

Baptista Porta, who, in the whimsical genealogy of the weapon-salve, given by Parson Foster, in his attack upon Dr. à Fluctibus, is mentioned as one of its fathers, had also great faith in the efficacy of the magnet, and operated upon the imagination of his patients in a manner which was then considered so extraordinary that he was accused of being a magician, and prohibited from practising by the court of Rome. Among others who distinguished themselves by their faith in magnetism, Sebastian Wirdig and William Maxwell claim especial notice. Wirdig was professor of medicine at the university of Rostock in Mecklenburg, and wrote a treatise called *The New Medicine of the Spirits*, which he presented to the Royal Society of London. An edition of this work was printed in 1673, in which the author maintained that a magnetic influence took place, not only between the celestial and terrestrial bodies, but between all living things. The whole world, he said, was under the influence of magnetism; life was preserved by magnetism; death was the consequence of magnetism!

Maxwell, the other enthusiast, was an admiring disciple of Paracelsus, and boasted that he had irradiated the obscurity in which too many of the wonder-working recipes of that great philosopher were enveloped. His works were printed at Frankfort in 1679. It would seem, from the following passage, that he was aware of the great influence of imagination, as well in the production as in the cure of diseases. “If you wish to work prodigies,” says he, “abstract from the materiality of beings—increase the sum of spirituality in bodies—rouse the spirit from its slumbers. Unless you do one

or other of these things—unless you can bind the idea, you can never perform any thing good or great.” Here, in fact, lies the whole secret of magnetism, and all delusions of a similar kind: increase the spirituality—rouse the spirit from its slumbers, or, in other words, work upon the imagination—induce belief and blind confidence, and you may do any thing. This passage, which is quoted with approbation by M. Dupotet⁶⁹ in a work, as strongly corroborative of the theory now advanced by the animal magnetists, is just the reverse. If they believe they can work all their wonders by the means so dimly shadowed forth by Maxwell, what becomes of the universal fluid pervading all nature, and which they pretend to pour into weak and diseased bodies from the tips of their fingers?

Early in the eighteenth century the attention of Europe was directed to a very remarkable instance of fanaticism, which has been claimed by the animal magnetists as a proof of their science. The *Convulsionaries of St. Medard*, as they were called, assembled in great numbers round the tomb of their favourite saint, the Jansenist priest Paris, and taught one another how to fall into convulsions. They believed that St. Paris would cure all their infirmities; and the number of hysterical women and weak-minded persons of all descriptions that flocked to the tomb from far and near was so great as daily to block up all the avenues leading to it. Working themselves up to a pitch of excitement, they went off one after the other into fits, while some of them, still in apparent possession of all their faculties, voluntarily exposed themselves to sufferings which on ordinary occasions would have been sufficient to deprive them of life. The scenes that occurred were a scandal to civilisation and to religion—a strange mixture of obscenity, absurdity, and superstition. While some were praying on bended knees at the shrine of St. Paris, others were shrieking and making the most hideous noises. The women especially exerted themselves. On one side of the chapel there might be seen a score of them, all in convulsions; while at another as many more, excited to a sort of frenzy, yielded themselves up to gross indecencies. Some of them took an

insane delight in being beaten and trampled upon. One in particular, according to Montégre, whose account we quote,⁷⁰ was so enraptured with this ill-usage, that nothing but the hardest blows would satisfy her. While a fellow of Herculean strength was beating her with all his might with a heavy bar of iron, she kept continually urging him to renewed exertion. The harder he struck the better she liked it, exclaiming all the while, "Well done, brother, well done! Oh, how pleasant it is! what good you are doing me! Courage, my brother, courage; strike harder, strike harder still!" Another of these fanatics had, if possible, a still greater love for a beating. Carré de Montgeron, who relates the circumstance, was unable to satisfy her with sixty blows of a large sledge-hammer. He afterwards used the same weapon with the same degree of strength, for the sake of experiment, and succeeded in battering a hole in a stone wall at the twenty-fifth stroke. Another woman, named Sonnet, laid herself down on a red-hot brazier without flinching, and acquired for herself the nickname of the *Salamander*; while others, desirous of a more illustrious martyrdom, attempted to crucify themselves. M. Deleuze, in his critical history of *Animal Magnetism*, attempts to prove that this fanatical frenzy was produced by magnetism, and that these mad enthusiasts magnetised each other without being aware of it. As well might he insist that the fanaticism which tempts the Hindoo bigot to keep his arms stretched in a horizontal position till the sinews wither, or his fingers closed upon his palms till the nails grow out of the backs of his hands, is also an effect of magnetism!

For a period of sixty or seventy years magnetism was almost wholly confined to Germany. Men of sense and learning devoted their attention to the properties of the loadstone; and one Father Hell, a Jesuit, and professor of astronomy at the University of Vienna, rendered himself famous by his magnetic cures. About the year 1771 or 1772 he invented steel-plates of a peculiar form, which he applied to the naked body as a cure for several diseases. In the year 1774 he communicated his system to Anthony Mesmer. The latter improved upon the ideas of Father Hell,

constructed a new theory of his own, and became the founder of ANIMAL MAGNETISM.

It has been the fashion among the enemies of the new delusion to decry Mesmer as an unprincipled adventurer, while his disciples have extolled him to the skies as a regenerator of the human race. In nearly the same words as the Rosicrucians applied to their founders, he has been called the discoverer of the secret which brings man into more intimate connexion with his Creator, the deliverer of the soul from the debasing trammels of the flesh, the man who enables us to set time at defiance, and conquer the obstructions of space. A careful sifting of his pretensions, and examination of the evidence brought forward to sustain them, will soon shew which opinion is the more correct. That the writer of these pages considers him in the light of a man who, deluding himself, was the means of deluding others, may be inferred from his finding a place in these volumes, and figuring among the Flamels, the Agrippas, the Borris, the Böhmens, and the Cagliostros.

He was born in May 1734, at Mersburg, in Swabia, and studied medicine at the University of Vienna. He took his degrees in 1766, and chose the influence of the planets on the human body as the subject of his inaugural dissertation. Having treated the matter quite in the style of the old astrological physicians, he was exposed to some ridicule both then and afterwards. Even at this early period some faint ideas of his great theory were germinating in his mind. He maintained in his dissertation “that the sun, moon, and fixed stars mutually affect each other in their orbits; that they cause and direct in our earth a flux and reflux not only in the sea, but in the atmosphere, and affect in a similar manner all organised bodies through the medium of a subtile and mobile fluid, which pervades the universe, and associates all things together in mutual intercourse and harmony.” This influence, he said, was particularly exercised on the nervous system, and produced two states, which he called *intension* and *remission*, which seemed to him to account for the different periodical

revolutions observable in several maladies. When in after-life he met with Father Hell, he was confirmed by that person's observations in the truth of many of his own ideas. Having caused Hell to make him some magnetic plates, he determined to try experiments with them himself for his further satisfaction.

He tried accordingly, and was astonished at his success. The faith of their wearers operated wonders with the metallic plates. Mesmer made due reports to Father Hell of all he had done, and the latter published them as the results of his own happy invention, and speaking of Mesmer as a physician whom he had employed to work under him. Mesmer took offence at being thus treated, considering himself a far greater personage than Father Hell. He claimed the invention as his own, accused Hell of a breach of confidence, and stigmatised him as a mean person, anxious to turn the discoveries of others to his own account. Hell replied, and a very pretty quarrel was the result, which afforded small talk for months to the literati of Vienna. Hell ultimately gained the victory. Mesmer, nothing daunted, continued to promulgate his views till he stumbled at last upon the animal theory.

One of his patients was a young lady, named Cæsterline, who suffered under a convulsive malady. Her attacks were periodical, and attended by a rush of blood to the head, followed by delirium and syncope. These symptoms he soon succeeded in reducing under his system of planetary influence, and imagined he could foretell the periods of accession and remission. Having thus accounted satisfactorily to himself for the origin of the disease, the idea struck him that he could operate a certain cure if he could ascertain beyond doubt, what he had long believed, that there existed between the bodies which compose our globe an action equally reciprocal and similar to that of the heavenly bodies, by means of which he could imitate artificially the periodical revolutions of the flux and reflux before mentioned. He soon convinced himself that this action did exist. When trying the metallic plates of Father Hell, he thought their efficacy depended

on their form; but he found afterwards that he could produce the same effects without using them at all, merely by passing his hands downwards towards the feet of the patient, even when at a considerable distance.

This completed the theory of Mesmer. He wrote an account of his discovery to all the learned societies of Europe, soliciting their investigation. The Academy of Sciences at Berlin was the only one that answered him, and their answer was any thing but favourable to his system or flattering to himself. Still he was not discouraged. He maintained to all who would listen to him that the magnetic matter, or fluid, pervaded all the universe—that every human body contained it, and could communicate the superabundance of it to another by an exertion of the will. Writing to a friend from Vienna, he said, “I have observed that the magnetic is almost the same thing as the electric fluid, and that it may be propagated in the same manner, by means of intermediate bodies. Steel is not the only substance adapted to this purpose. I have rendered paper, bread, wool, silk, stones, leather, glass, wood, men, and dogs—in short, every thing I touched, magnetic to such a degree, that these substances produced the same effects as the loadstone on diseased persons. I have charged jars with magnetic matter in the same way as is done with electricity.”

Mesmer did not long find his residence at Vienna as agreeable as he wished. His pretensions were looked upon with contempt or indifference, and the case of Mademoiselle Cœsterline brought him less fame than notoriety. He determined to change his sphere of action, and travelled into Swabia and Switzerland. In the latter country he met with the celebrated Father Gassner, who, like Valentine Greatraks, amused himself by casting out devils, and healing the sick by merely laying hands upon them. At his approach, delicate girls fell into convulsions, and hypochondriacs fancied themselves cured. His house was daily besieged by the lame, the blind, and the hysteric. Mesmer at once acknowledged the efficacy of his cures, and declared that they were the obvious result of his own newly-discovered power of magnetism. A few of the father’s patients were forthwith

subjected to the manipulations of Mesmer, and the same symptoms were induced. He then tried his hand upon some paupers in the hospitals of Berne and Zurich, and succeeded, according to his own account, but no other person's, in curing an ophthalmia and a gutta serena. With memorials of these achievements he returned to Vienna, in the hope of silencing his enemies, or at least forcing them to respect his newly-acquired reputation, and to examine his system more attentively.

His second appearance in that capital was not more auspicious than the first. He undertook to cure a Mademoiselle Paradis, who was quite blind, and subject to convulsions. He magnetised her several times, and then declared that she was cured; at least, if she was not, it was her fault and not his. An eminent oculist of that day, named Barth, went to visit her, and declared that she was as blind as ever; while her family said she was as much subject to convulsions as before. Mesmer persisted that she was cured. Like the French philosopher, he would not allow facts to interfere with his theory.⁷¹ He declared that there was a conspiracy against him; and that Mademoiselle Paradis, at the instigation of her family, feigned blindness in order to injure his reputation!

The consequences of this pretended cure taught Mesmer that Vienna was not the sphere for him. Paris, the idle, the debauched, the pleasure-hunting, the novelty-loving, was the scene for a philosopher like him, and thither he repaired accordingly. He arrived at Paris in 1778, and began modestly by making himself and his theory known to the principal physicians. At first, his encouragement was but slight; he found people more inclined to laugh at than to patronise him. But he was a man who had great confidence in himself, and of a perseverance which no difficulties could overcome. He hired a sumptuous apartment, which he opened to all comers who chose to make trial of the new power of nature. M. D'Eslon, a physician of great reputation, became a convert; and from that time, animal magnetism, or, as some called it, mesmerism, became the fashion in Paris. The women were quite enthusiastic about it, and their admiring

tattle wafted its fame through every grade of society. Mesmer was the rage; and high and low, rich and poor, credulous and unbelieving, all hastened to convince themselves of the power of this mighty magician, who made such magnificent promises. Mesmer, who knew as well as any man living the influence of the imagination, determined that, on that score, nothing should be wanting to heighten the effect of the magnetic charm. In all Paris, there was not a house so charmingly furnished as Monsieur Mesmer's. Richly-stained glass shed a dim religious light on his spacious saloons, which were almost covered with mirrors. Orange-blossoms scented all the air of his corridors; incense of the most expensive kinds burned in antique vases on his chimney-pieces; æolian harps sighed melodious music from distant chambers; while sometimes a sweet female voice, from above or below, stole softly upon the mysterious silence that was kept in the house, and insisted upon from all visitors. "*Was ever any thing so delightful!*" cried all the Mrs. Wittitterleys of Paris, as they thronged to his house in search of pleasant excitement; "*So wonderful!*" said the pseudo-philosophers, who would believe anything if it were the fashion; "*So amusing!*" said the worn-out debauchés, who had drained the cup of sensuality to its dregs, and who longed to see lovely women in convulsions, with the hope that they might gain some new emotions from the sight.

The following was the mode of operation: In the centre of the saloon was placed an oval vessel, about four feet in its longest diameter, and one foot deep. In this were laid a number of wine-bottles, filled with magnetised water, well corked-up, and disposed in radii, with their necks outwards. Water was then poured into the vessel so as just to cover the bottles, and filings of iron were thrown in occasionally to heighten the magnetic effect. The vessel was then covered with an iron cover, pierced through with many holes, and was called the *baquet*. From each hole issued a long movable rod of iron, which the patients were to apply to such parts of their bodies as were afflicted. Around this *baquet* the patients were directed to sit, holding

each other by the hand, and pressing their knees together as closely as possible, to facilitate the passage of the magnetic fluid from one to the other.

Then came in the assistant magnetisers, generally strong, handsome young men, to pour into the patient from their finger-tips fresh streams of the wondrous fluid. They embraced the patient between the knees, rubbed them gently down the spine and the course of the nerves, using gentle pressure upon the breasts of the ladies, and staring them out of countenance to magnetise them by the eye! All this time the most rigorous silence was maintained, with the exception of a few wild notes on the harmonica or the piano-forte, or the melodious voice of a hidden opera-singer swelling softly at long intervals. Gradually the cheeks of the ladies began to glow, their imaginations to become inflamed; and off they went, one after the other, in convulsive fits. Some of them sobbed and tore their hair, others laughed till the tears ran from their eyes, while others shrieked and screamed and yelled till they became insensible altogether.

This was the crisis of the delirium. In the midst of it, the chief actor made his appearance, waving his wand, like Prospero, to work new wonders. Dressed in a long robe of lilac-coloured silk richly embroidered with gold flowers, bearing in his hand a white magnetic rod, and with a look of dignity which would have sat well on an eastern caliph, he marched with solemn strides into the room. He awed the still sensible by his eye, and the violence of their symptoms diminished. He stroked the insensible with his hands upon the eye-brows and down the spine; traced figures upon their breast and abdomen with his long white wand, and they were restored to consciousness. They became calm, acknowledged his power, and said they felt streams of cold or burning vapour passing through their frames, according as he waved his wand or his fingers before them.

“It is impossible,” says M. Dupotet, “to conceive the sensation which Mesmer’s experiments created in Paris. No theological controversy, in the earlier ages of the Catholic Church, was ever conducted with greater

bitterness.” His adversaries denied the discovery; some calling him a quack, others a fool, and others again, like the Abbé Fiard, a man who had sold himself to the Devil! His friends were as extravagant in their praise, as his foes were in their censure. Paris was inundated with pamphlets upon the subject, as many defending as attacking the doctrine. At court, the queen expressed herself in favour of it, and nothing else was to be heard of in society.

By the advice of M. D’Eslon, Mesmer challenged an examination of his doctrine by the Faculty of Medicine. He proposed to select twenty-four patients, twelve of whom he would treat magnetically, leaving the other twelve to be treated by the faculty according to the old and approved methods. He also stipulated that, to prevent disputes, the government should nominate certain persons who were not physicians, to be present at the experiments; and that the object of the inquiry should be, not how these effects were produced, but whether they were really efficacious in the cure of any disease. The faculty objected to limit the inquiry in this manner, and the proposition fell to the ground.

Mesmer now wrote to Marie Antoinette, with the view of securing her influence in obtaining for him the protection of government. He wished to have a château and its lands given to him, with a handsome yearly income, that he might be enabled to continue his experiments at leisure, untroubled by the persecution of his enemies. He hinted the duty of governments to support men of science, and expressed his fear, that if he met no more encouragement, he should be compelled to carry his great discovery to some other land more willing to appreciate him. “In the eyes of your majesty,” said he, “four or five hundred thousand francs, applied to a good purpose, are of no account. The welfare and happiness of your people are every thing. My discovery ought to be received and rewarded with a munificence worthy of the monarch to whom I shall attach myself.” The government at last offered him a pension of twenty thousand francs, and the cross of the order of St. Michael, if he had made any discovery in

medicine, and would communicate it to physicians nominated by the king. The latter part of the proposition was not agreeable to Mesmer. He feared the unfavourable report of the king's physicians; and, breaking off the negotiation, spoke of his disregard of money, and his wish to have his discovery at once recognised by the government. He then retired to Spa, in a fit of disgust, upon pretence of drinking the waters for the benefit of his health.

After he had left Paris, the Faculty of Medicine called upon M. D'Eslon, for the third and last time, to renounce the doctrine of animal magnetism, or be expelled from their body. M. D'Eslon, so far from doing this, declared that he had discovered new secrets, and solicited further examination. A royal commission of the Faculty of Medicine was, in consequence, appointed on the 12th of March 1784, seconded by another commission of the Académie des Sciences, to investigate the phenomena and report upon them. The first commission was composed of the principal physicians of Paris; while, among the eminent men comprised in the latter, were Benjamin Franklin, Lavoisier, and Bailly the historian of astronomy. Mesmer was formally invited to appear before this body, but absented himself from day to day, upon one pretence or another. M. D'Eslon was more honest, because he thoroughly believed in the phenomena, which it is to be questioned if Mesmer ever did, and regularly attended the sittings and performed experiments.

Bailly has thus described the scenes of which he was a witness in the course of this investigation. "The sick persons, arranged in great numbers and in several rows around the *baquet*, receive the magnetism, by all these means: by the iron rods which convey it to them from the *baquet*—by the cords wound round their bodies—by the connexion of the thumb, which conveys to them the magnetism of their neighbours—and by the sounds of a piano-forte, or of an agreeable voice, diffusing the magnetism in the air. The patients were also directly magnetised by means of the finger and wand of the magnetiser moved slowly before their faces, above or behind

their heads, and on the diseased parts, always observing the direction of the holes. The magnetiser acts by fixing his eyes on them. But above all, they are magnetised by the application of his hands and the pressure of his fingers on the hypochondres and on the regions of the abdomen; an application often continued for a long time—sometimes for several hours.

“Meanwhile the patients in their different conditions present a very varied picture. Some are calm, tranquil, and experience no effect. Others cough, spit, feel slight pains, local or general heat, and have sweatings. Others again are agitated and tormented with convulsions. These convulsions are remarkable in regard to the number affected with them, to their duration and force. As soon as one begins to be convulsed, several others are affected. The commissioners have observed some of these convulsions last more than three hours. They are accompanied with expectorations of a muddy viscous water, brought away by violent efforts. Sometimes streaks of blood have been observed in this fluid. These convulsions are characterised by the precipitous, involuntary motion of all the limbs, and of the whole body; by the contraction of the throat—by the leaping motions of the hypochondria and the epigastrium—by the dimness and wandering of the eyes—by piercing shrieks, tears, sobbing, and immoderate laughter. They are preceded or followed by a state of langour or reverie, a kind of depression, and sometimes drowsiness. The smallest sudden noise occasions a shuddering; and it was remarked, that the change of measure in the airs played on the piano-forte had a great influence on the patients. A quicker motion, a livelier melody, agitated them more, and renewed the vivacity of their convulsions.

“Nothing is more astonishing than the spectacle of these convulsions. One who has not seen them can form no idea of them. The spectator is as much astonished at the profound repose of one portion of the patients as at the agitation of the rest—at the various

accidents which are repeated, and at the sympathies which are exhibited. Some of the patients may be seen devoting their attention exclusively to one another, rushing towards each other with open arms, smiling, soothing, and manifesting every symptom of attachment and affection. All are under the power of the magnetiser; it matters not in what state of drowsiness they may be, the sound of his voice—a look, a motion of his hand—brings them out of it. Among the patients in convulsions there are always observed a great many women, and very few men.”⁷²

These experiments lasted for about five months. They had hardly commenced, before Mesmer, alarmed at the loss both of fame and profit, determined to return to Paris. Some patients of rank and fortune, enthusiastic believers in his doctrine, had followed him to Spa. One of them named Bergasse, proposed to open a subscription for him, of one hundred shares, at one hundred louis each, on condition that he would disclose his secret to the subscribers, who were to be permitted to make whatever use they pleased of it. Mesmer readily embraced the proposal; and such was the infatuation, that the subscription was not only filled in a few days, but exceeded by no less a sum than one hundred and forty thousand francs.

With this fortune he returned to Paris, and recommenced his experiments, while the royal commission continued theirs. His admiring pupils, who had paid him so handsomely for his instructions, spread his fame over the country, and established in all the principal towns of France, “Societies of Harmony,” for trying experiments and curing all diseases by means of magnetism. Some of these societies were a scandal to morality, being joined by profligate men of depraved appetites, who took a disgusting delight in witnessing young girls in convulsions. Many of the pretended magnetisers were asserted at the time to be notorious libertines, who took that opportunity of gratifying their passions.

At last the commissioners published their report, which was drawn up by the illustrious and unfortunate Bailly. For clearness of reasoning and strict impartiality it has never been surpassed. After detailing the various experiments made, and their results, they came to the conclusion that the only proof advanced in support of animal magnetism was the effects it produced on the human body—that those effects could be produced without passes or other magnetic manipulations—that all these manipulations and passes and ceremonies never produce any effect at all if employed without the patient's knowledge; and that therefore imagination did, and animal magnetism did not, account for the phenomena.

This report was the ruin of Mesmer's reputation in France. He quitted Paris shortly after, with the three hundred and forty thousand francs which had been subscribed by his admirers, and retired to his own country, where he died in 1815, at the advanced age of eighty-one. But the seeds he had sown fructified of themselves, nourished and brought to maturity by the kindly warmth of popular credulity. Imitators sprang up in France, Germany, and England, more extravagant than their master, and claiming powers for the new science which its founder had never dreamt of. Among others, Cagliostro made good use of the delusion in extending his claims to be considered a master of the occult sciences. But he made no discoveries worthy to be compared to those of the Marquis de Puysegur and the Chevalier Barbarin, honest men, who began by deceiving themselves before they deceived others.

The Marquis de Puysegur, the owner of a considerable estate at Busancy, was one of those who had entered into the subscription for Mesmer. After that individual had quitted France, he retired to Busancy, with his brother, to try animal magnetism upon his tenants, and cure the country people of all manner of diseases. He was a man of great simplicity and much benevolence, and not only magnetised but fed the sick that flocked around him. In all the neighbourhood, and indeed within a circumference of twenty miles, he was looked upon as endowed with a power almost divine.

His great discovery, as he called it, was made by chance. One day he had magnetised his gardener; and observing him to fall into a deep sleep, it occurred to him that he would address a question to him, as he would have done to a natural somnambulist. He did so, and the man replied with much clearness and precision. M. de Puysegur was agreeably surprised: he continued his experiments, and found that, in this state of magnetic somnambulism, *the soul of the sleeper was enlarged, and brought into more intimate communion with all nature, and more especially with him, M. de Puysegur.* He found that all further manipulations were unnecessary; that, without speaking or making any sign, he could convey his will to the patient; that he could, in fact, converse with him, soul to soul, without the employment of any physical operation whatever!

Simultaneously with this marvellous discovery he made another, which reflects equal credit upon his understanding. Like Valentine Greatraks, he found it hard work to magnetise all that came—that he had not even time to take the repose and relaxation which were necessary for his health. In this emergency he hit upon a clever expedient. He had heard Mesmer say that he could magnetise bits of wood: why should he not be able to magnetise a whole tree? It was no sooner thought than done. There was a large elm on the village green at Busancy, under which the peasant girls used to dance on festive occasions, and the old men to sit, drinking their *vin du pays*, on the fine summer evenings. M. de Puysegur proceeded to this tree and magnetised it, by first touching it with his hands, and then retiring a few steps from it; all the while directing streams of the magnetic fluid from the branches toward the trunk, and from the trunk toward the root. This done, he caused circular seats to be erected round it, and cords suspended from it in all directions. When the patients had seated themselves, they twisted the cords round the diseased parts of their bodies, and held one another firmly by their thumbs to form a direct channel of communication for the passage of the fluid.

M. de Puysegur had now two “hobbies”—the man with the enlarged soul and the magnetic elm. The infatuation of himself and his patients cannot be better expressed than in his own words. Writing to his brother, on the 17th of May 1784, he says, “If you do not come, my dear friend, you will not see my extraordinary man, for his health is now almost quite restored. I continue to make use of the happy power for which I am indebted to M. Mesmer. Every day I bless his name; for I am very useful, and produce many salutary effects on all the sick poor in the neighbourhood. They flock around my tree; there were more than one hundred and thirty of them this morning. It is the best *baquet* possible; *not a leaf of it but communicates health!* all feel, more or less, the good effects of it. You will be delighted to see the charming picture of humanity which this presents. I have only one regret—it is, that I cannot touch all who come. But my magnetised man—my intelligence—sets me at ease. He teaches me what conduct I should adopt. According to him, it is not at all necessary that I should touch every one; a look, a gesture, even a wish, is sufficient. And it is one of the most ignorant peasants of the country that teaches me this! When he is in a crisis, I know of nothing more profound, more prudent, more clear-sighted (*clairvoyant*) than he is.”

In another letter, describing his first experiment with the magnetic tree, he says, “Yesterday evening I brought my first patient to it. As soon as I had put the cord round him he gazed at the tree; and, with an air of astonishment which I cannot describe, exclaimed, ‘What is it that I see there?’ His head then sunk down, and he fell into a perfect fit of somnambulism. At the end of an hour, I took him home to his house again, when I restored him to his senses. Several men and women came to tell him what he had been doing. He maintained it was not true; that, weak as he was, and scarcely able to walk, it would have been scarcely possible for him to have gone down stairs and walked to the tree. To-day I have repeated the experiment on him, and with the same success. I own to you that my head turns round with pleasure to think of the good I do. Madame

de Puysegur, the friends she has with her, my servants, and, in fact, all who are near me, feel an amazement, mingled with admiration, which cannot be described; but they do not experience the half of my sensations. Without my tree, which gives me rest, and which will give me still more, I should be in a state of agitation, inconsistent, I believe, with my health. I exist too much, if I may be allowed to use the expression.”

In another letter, he descants still more poetically upon his gardener with the enlarged soul. He says, “It is from this simple man, this tall and stout rustic, twenty-three years of age, enfeebled by disease, or rather by sorrow, and therefore the more predisposed to be affected by any great natural agent,—it is from this man, I repeat, that I derive instruction and knowledge. When in the magnetic state, he is no longer a peasant who can hardly utter a single sentence; he is a being, to describe whom I cannot find a name. I need not speak; *I have only to think before him, when he instantly understands and answers me.* Should any body come into the room, he sees him, if I desire it (but not else), and addresses him, and says what I wish to say; not indeed exactly as I dictate to him, but as truth requires. When he wants to add more than I deem it prudent strangers should hear, I stop the flow of his ideas, and of his conversation in the middle of a word, and give it quite a different turn!”

Among other persons attracted to Busancy by the report of these extraordinary occurrences was M. Cloquet, the Receiver of Finance. His appetite for the marvellous being somewhat insatiable, he readily believed all that was told him by M. de Puysegur. He also has left a record of what he saw, and what he credited, which throws a still clearer light upon the progress of the delusion.⁷³ He says that the patients he saw in the magnetic state had an appearance of deep sleep, during which all the physical faculties were suspended, to the advantage of the intellectual faculties. The eyes of the patients were closed, the sense of hearing was abolished; and they awoke only at the voice of their magnetiser. “If any one touched a patient during a crisis, or even the chair on which he was seated,” says M.

Cloquet, “it would cause him much pain and suffering, and throw him into convulsions. During the crisis, they possess an extraordinary and supernatural power, by which, on touching a patient presented to them, they can feel what part of his body is diseased, even by merely passing their hand over the clothes.” Another singularity was, that these sleepers who could thus discover diseases, see into the interior of other men’s stomachs, and point out remedies, remembered absolutely nothing after the magnetiser thought proper to disenchant them. The time that elapsed between their entering the crisis and their coming out of it was obliterated. Not only had the magnetiser the power of making himself heard by the somnambulists, but he could make them follow him by merely pointing his finger at them from a distance, though they had their eyes the whole time completely closed.

Such was animal magnetism under the auspices of the Marquis de Puysegur. While he was exhibiting these phenomena around his elm-tree, a magnetiser of another class appeared in Lyons, in the person of the Chevalier de Barbarin. This gentleman thought the effort of the will, without any of the paraphernalia of wands or *baquets*, was sufficient to throw patients into the magnetic sleep. He tried it and succeeded. By sitting at the bedside of his patients, and praying that they might be magnetised, they went off into a state very similar to that of the persons who fell under the notice of M. de Puysegur. In the course of time a very considerable number of magnetisers, acknowledging Barbarin for their model, and called after him Barbarinists, appeared in different parts, and were believed to have effected some remarkable cures. In Sweden and Germany this sect of fanatics increased rapidly, and were called *spiritualists*, to distinguish them from the followers of M. de Puysegur, who were called *experimentalists*. They maintained that all the effects of animal magnetism, which Mesmer believed to be producible by a magnetic fluid dispersed through nature, were produced by the mere effort of one human soul acting upon another; that when a connexion had once been

established between a magnetiser and his patient, the former could communicate his influence to the latter from any distance, even hundreds of miles, by the will. One of them thus described the blessed state of a magnetic patient: “In such a man animal instinct ascends to the highest degree admissible in this world. The *clairvoyant* is then a pure animal, without any admixture of matter. His observations are those of a spirit. He is similar to God: his eye penetrates all the secrets of nature. When his attention is fixed on any of the objects of this world—on his disease, his death, his well-beloved, his friends, his relations, his enemies—in spirit he sees them acting; he penetrates into the causes and the consequences of their actions; he becomes a physician, a prophet, a divine!”⁷⁴

Let us now see what progress these mysteries made in England. In the year 1788 Dr. Mainauduc, who had been a pupil, first of Mesmer, and afterwards of D’Eslon, arrived in Bristol, and gave public lectures upon magnetism. His success was quite extraordinary. People of rank and fortune hastened from London to Bristol to be magnetised, or to place themselves under his tuition. Dr. George Winter, in his *History of Animal Magnetism*, gives the following list of them: “They amounted to one hundred and twenty-seven, among whom there were one duke, one duchess, one marchioness, two countesses, one earl, one baron, three baronesses, one bishop, five right honourable gentlemen and ladies, two baronets, seven members of parliament, one clergyman, two physicians, seven surgeons, besides ninety-two gentlemen and ladies of respectability.” He afterwards established himself in London, where he performed with equal success.

He began by publishing proposals to the ladies for the formation of a Hygeian Society. In this paper he vaunted highly the curative effects of animal magnetism, and took great credit to himself for being the first person to introduce it into England, and thus concluded: “As this method of cure is not confined to sex or college education, and the fair sex being in general the most sympathising part of the creation, and most immediately

concerned in the health and care of its offspring, I think myself bound in gratitude to you, ladies, for the partiality you have shewn me in midwifery, to contribute, as far as lies in my power, to render you additionally useful and valuable to the community. With this view I propose forming my Hygeian Society, to be incorporated with that of Paris. As soon as twenty ladies have given in their names, the day shall be appointed for the first meeting at my house, when they are to pay fifteen guineas, which will include the whole expense.”

Hannah More, in a letter addressed to Horace Walpole in September 1788, speaks of the “demoniacal mummeries” of Dr. Mainauduc, and says he was in a fair way of gaining a hundred thousand pounds by them, as Mesmer had done by his exhibitions in Paris.

So much curiosity was excited by the subject, that, about the same time, a man named Holloway gave a course of lectures on animal magnetism in London, at the rate of five guineas for each pupil, and realised a considerable fortune. Louthembourg the painter and his wife followed the same profitable trade; and such was the infatuation of the people to be witnesses of their strange manipulations, that at times upwards of three thousand persons crowded around their house at Hammersmith, unable to gain admission. The tickets sold at prices varying from one to three guineas. Louthembourg performed his cures by the touch, after the manner of Valentine Greatraks, and finally pretended to a divine mission. An account of his miracles, as they were called, was published in 1789, entitled *A List of New Cures performed by Mr. and Mrs. de Louthembourg, of Hammersmith Terrace, without Medicine; by a Lover of the Lamb of God. Dedicated to his Grace the Archbishop of Canterbury.*

This “Lover of the Lamb of God” was a half-crazy old woman, named Mary Pratt, who conceived for Mr. and Mrs. de Louthembourg a veneration which almost prompted her to worship them. She chose for the motto of her pamphlet a verse in the thirteenth chapter of the Acts of the Apostles: “Behold, ye despisers, and wonder and perish! for I will work a work in

your days which ye shall not believe, though a man declare it unto you.” Attempting to give a religious character to the cures of the painter, she thought a *woman* was the proper person to make them known, since the apostle had declared that a *man* should not be able to conquer the incredulity of the people. She stated, that from Christmas 1788 to July 1789, De Louthembourg and his wife had cured two thousand people, “having been made *proper recipients to receive divine manuductions*; which heavenly and divine influx, coming from the radix *God*, his Divine Majesty had most graciously bestowed upon them to diffuse healing to all, be they deaf, dumb, blind, lame, or halt.”

In her dedication to the Archbishop of Canterbury she implored him to compose a new form of prayer, to be used in all churches and chapels, that nothing might impede this inestimable gift from having its due course. She further entreated all the magistrates and men of authority in the land to wait on Mr. and Mrs. de Louthembourg, to consult with them on the immediate erection of a large hospital, with a pool of Bethesda attached to it. All the magnetisers were scandalised at the preposterous jabber of this old woman, and De Louthembourg appears to have left London to avoid her, —continuing, however, in conjunction with his wife, the fantastic tricks which had turned the brain of this poor fanatic, and deluded many others who pretended to more sense than she had.

From this period until 1798 magnetism excited little or no attention in England. An attempt to revive the belief in it was made in that year, but it was in the shape of mineral rather than of animal magnetism. One Benjamin Douglas Perkins, an American, practising as a surgeon in Leicester Square, invented and took out a patent for the celebrated “Metallic Tractors.” He pretended that these tractors, which were two small pieces of metal strongly magnetised, something resembling the steel plates which were first brought into notice by Father Hell, would cure gout, rheumatism, palsy, and, in fact, almost every disease the human frame was subject to, if applied externally to the afflicted part, and moved about

gently, touching the surface only. The most wonderful stories soon obtained general circulation, and the press groaned with pamphlets, all vaunting the curative effects of the tractors, which were sold at five guineas the pair. Perkins gained money rapidly. Gouty subjects forgot their pains in the presence of this new remedy; the rheumatism fled at its approach; and toothache, which is often cured by the mere sight of a dentist, vanished before Perkins and his marvellous steel-plates. The benevolent Society of Friends, of whose body he was a member, warmly patronised the invention. Desirous that the poor, who could not afford to pay Mr. Perkins five guineas, or even five shillings for his tractors, should also share in the benefits of that sublime discovery, they subscribed a large sum, and built an hospital, called the "Perkinean Institution," in which all comers might be magnetised free of cost. In the course of a few months they were in very general use, and their lucky inventor in possession of five thousand pounds.

Dr. Haygarth, an eminent physician at Bath, recollecting the influence of imagination in the cure of disease, hit upon an expedient to try the real value of the tractors. Perkins's cures were too well established to be doubted; and Dr. Haygarth, without gain-saying them, quietly, but in the face of numerous witnesses, exposed the delusion under which people laboured with respect to the curative medium. He suggested to Dr. Falconer that they should make wooden tractors, paint them to resemble the steel ones, and see if the very same effects would not be produced. Five patients were chosen from the hospital in Bath, upon whom to operate. Four of them suffered severely from chronic rheumatism in the ankle, knee, wrist, and hip; and the fifth had been afflicted for several months with the gout. On the day appointed for the experiments Dr. Haygarth and his friends assembled at the hospital, and with much solemnity brought forth the fictitious tractors. Four out of the five patients said their pains were immediately relieved; and three of them said they were not only relieved but very much benefited. One felt his knee warmer, and said he

could walk across the room. He tried and succeeded, although on the previous day he had not been able to stir. The gouty man felt his pains diminish rapidly, and was quite easy for nine hours, until he went to bed, when the twitching began again. On the following day the real tractors were applied to all the patients, when they described their symptoms in nearly the same terms.

To make still more sure, the experiment was tried in the Bristol infirmary, a few weeks afterwards, on a man who had a rheumatic affection in the shoulder, so severe as to incapacitate him from lifting his hand from his knee. The fictitious tractors were brought and applied to the afflicted part, one of the physicians, to add solemnity to the scene, drawing a stopwatch from his pocket to calculate the time exactly, while another, with a pen in his hand, sat down to write the change of symptoms from minute to minute as they occurred. In less than four minutes the man felt so much relieved, that he lifted his hand several inches without any pain in the shoulder!

An account of these matters was published by Dr. Haygarth, in a small volume entitled, *Of the Imagination, as a Cause and Cure of Disorders, exemplified by fictitious Tractors*. The exposure was a *coup de grace* to the system of Mr. Perkins. His friends and patrons, still unwilling to confess that they had been deceived, tried the tractors upon sheep, cows, and horses, alleging that the animals received benefit from the metallic plates, but none at all from the wooden ones. But they found nobody to believe them; the Perkinian institution fell into neglect; and Perkins made his exit from England, carrying with him about ten thousand pounds, to soothe his declining years in the good city of Pennsylvania.

Thus was magnetism laughed out of England for a time. In France the revolution left men no leisure for studying it. The *Sociétés de l'Harmonie* of Strasbourg, and other great towns lingered for a while, till sterner matters occupying men's attention, they were one after the other abandoned, both by pupils and professors. The system, thus driven from the first two

nations of Europe, took refuge among the dreamy philosophers of Germany. There the wonders of the magnetic sleep grew more and more wonderful every day; the patients acquired the gift of prophecy; their vision extended over all the surface of the globe; they could hear and see with their toes and fingers, and read unknown languages, and understand them too, by merely having the book placed on their stomachs. Ignorant peasants, when once entranced by the grand mesmeric fluid, could spout philosophy diviner than Plato ever wrote, descant upon the mysteries of the mind with more eloquence and truth than the profoundest metaphysicians the world ever saw, and solve knotty points of divinity with as much ease as waking men could undo their shoe-buckles!

During the first twelve years of the present century little was heard of animal magnetism in any country of Europe. Even the Germans forgot their airy fancies, recalled to the knowledge of this every-day world by the roar of Napoleon's cannon and the fall or the establishment of kingdoms. During this period a cloud of obscurity hung over the science, which was not dispersed until M. Deleuze published, in 1813, his *Histoire Critique du Magnétisme Animal*. This work gave a new impulse to the half-forgotten fancy. Newspapers, pamphlets, and books again waged war upon each other on the question of its truth or falsehood; and many eminent men in the profession of medicine recommenced inquiry with an earnest design to discover the truth.

The assertions made in the celebrated treatise of Deleuze are thus summed up:⁷⁵ "There is a fluid continually escaping from the human body," and "forming an atmosphere around us," which, as "it has no determined current," produces no sensible effects on surrounding individuals. It is, however, "capable of being directed by the will;" and, when so directed, "is sent forth in currents," with a force corresponding to the energy we possess. Its motion is "similar to that of the rays from burning bodies;" "it possesses different qualities in different individuals." It is capable of a high degree of concentration, "and exists also in trees." The

will of the magnetiser, “guided by a motion of the hand, several times repeated in the same direction,” can fill a tree with this fluid. Most persons, when this fluid is poured into them from the body and by the will of the magnetiser, “feel a sensation of heat or cold” when he passes his hand before them, without even touching them. Some persons, when sufficiently charged with this fluid, fall into a state of somnambulism, or magnetic ecstasy; and when in this state, “they see the fluid encircling the magnetiser like a halo of light, and issuing in luminous streams from his mouth and nostrils, his head and hands, possessing a very agreeable smell, and communicating a particular taste to food and water.”

One would think that these “notions” were quite enough to be insisted upon by any physician who wished to be considered sane; but they form only a small portion of the wondrous things related by M. Deleuze. He further said, “When magnetism produces somnambulism, the person who is in this state acquires a prodigious extension of all his faculties. Several of his external organs, especially those of sight and hearing, become inactive; but the sensations which depend upon them take place internally. Seeing and hearing are carried on by the magnetic fluid, which transmits the impressions immediately, and without the intervention of any nerves or organs directly to the brain. Thus the somnambulist, though his eyes and ears are closed, not only sees and hears, but sees and hears much better than he does when awake. In all things he feels the will of the magnetiser, although that will be not expressed. He sees into the interior of his own body, and the most secret organisation of the bodies of all those who may be put *en rapport*, or in magnetic connexion, with him. Most commonly, he only sees those parts which are diseased and disordered, and intuitively prescribes a remedy for them. He has prophetic visions and sensations, which are generally true, but sometimes erroneous. He expresses himself with astonishing eloquence and facility. He is not free from vanity. He becomes a more perfect being of his own accord for a certain time, if guided wisely by the magnetiser, but wanders if he is ill-directed.”

According to M. Deleuze, any person could become a magnetiser and produce these effects, by conforming to the following conditions, and acting upon the following rules:

“Forget for a while all your knowledge of physics and metaphysics.

“Remove from your mind all objections that may occur.

“Imagine that it is in your power to take the malady in hand, and throw it on one side.

“Never reason for six weeks after you have commenced the study.

“Have an active desire to do good; a firm belief in the power of magnetism, and an entire confidence in employing it. In short, repel all doubts; desire success, and act with simplicity and attention.”

That is to say, “be very credulous; be very persevering; reject all past experience, and do not listen to reason,” and you are a magnetiser after M. Deleuze’s own heart.

Having brought yourself into this edifying state, “remove from the patient all persons who might be troublesome to you; keep with you only the necessary witnesses—a single person if need be; desire them not to occupy themselves in any way with the processes you employ and the effects which result from them, but to join with you in the desire of doing good to your patient. Arrange yourself so as neither to be too hot nor too cold, and in such a manner that nothing may obstruct the freedom of your motions; and take precautions to prevent interruption during the sitting. Make your patient then sit as commodiously as possible, and place yourself opposite to him, on a seat a little more elevated, in such a manner that his knees may be betwixt yours, and your feet at the side of his. First, request him to resign himself; to think of nothing; not to perplex himself by examining the effects which may be produced; to banish all fear; to surrender himself to hope, and not to be disturbed or discouraged if the action of magnetism should cause in him momentary pains. After having

collected yourself, take his thumbs between your fingers in such a way that the internal part of your thumbs may be in contact with the internal part of his, *and then fix your eyes upon him!* You must remain from two to five minutes in this situation, or until you feel an equal heat between your thumbs and his. This done, you will withdraw your hands, removing them to the right and left; and at the same time turning them till their internal surface be outwards, and you will raise them to the height of the head. You will now place them upon the two shoulders, and let them remain there about a minute; afterwards drawing them gently along the arms to the extremities of the fingers, touching very slightly as you go. You will renew this pass five or six times, always turning your hands, and removing them a little from the body before you lift them. You will then place them above the head; and after holding them there for an instant, lower them, passing them before the face, at the distance of one or two inches, down to the pit of the stomach. There you will stop them two minutes also, putting your thumbs upon the pit of the stomach and the rest of your fingers below the ribs. You will then descend slowly along the body to the knees, or rather, if you can do so without deranging yourself, to the extremity of the feet. You will repeat the same processes several times during the remainder of the sitting. You will also occasionally approach your patient, so as to place your hands behind his shoulders, in order to descend slowly along the spine of the back and the thighs, down to the knees or the feet. After the first passes, you may dispense with putting your hands upon the head, and may make the subsequent passes upon the arms, beginning at the shoulders, and upon the body, beginning at the stomach.”

Such was the process of magnetising recommended by Deleuze. That delicate, fanciful, and nervous women, when subjected to it, should have worked themselves into convulsions will be readily believed by the sturdiest opponent of animal magnetism. To sit in a constrained posture—be stared out of countenance by a fellow who enclosed her knees between his, while he made *passes* upon different parts of her body, was quite

enough to throw any weak woman into a fit, especially if she were predisposed to hysteria, and believed in the efficacy of the treatment. It is just as evident that those of stronger minds and healthier bodies should be sent to sleep by the process. That these effects have been produced by these means, there are thousands of instances to shew. But are they testimony in favour of animal magnetism?—do they prove the existence of the magnetic fluid? It needs neither magnetism, nor ghost from the grave, to tell us that silence, monotony, and long recumbency in one position, must produce sleep; or that excitement, imitation, and a strong imagination acting upon a weak body, will bring on convulsions.

M. Deleuze's book produced quite a sensation in France; the study was resumed with redoubled vigour. In the following year, a journal was established devoted exclusively to the science, under the title of *Annales du Magnétisme Animal*; and shortly afterwards appeared the *Bibliothèque du Magnétisme Animal*, and many others. About the same time, the Abbé Faria, "the man of wonders," began to magnetise; and the belief being that he had more of the mesmeric fluid about him, and a stronger will, than most men, he was very successful in his treatment. His experiments afford a convincing proof that imagination can operate all, and the supposed fluid none, of the results so confidently claimed as evidence of the new science. He placed his patients in an arm-chair; told them to shut their eyes; and then, in a loud commanding voice, pronounced the single word, "Sleep!" He used no manipulations whatever—had no *baquet*, or conductor of the fluid; but he nevertheless succeeded in causing sleep in hundreds of patients. He boasted of having in his time produced five thousand somnambulists by this method. It was often necessary to repeat the command three or four times; and if the patient still remained awake, the abbé got out of the difficulty by dismissing him from the chair, and declaring that he was incapable of being acted on. And it should be especially remarked that the magnetisers do not lay claim to universal efficacy for their fluid; the strong and the healthy cannot be magnetised;

the incredulous cannot be magnetised; those who reason upon it cannot be magnetised; those who firmly believe in it can be magnetised; the weak in body can be magnetised, and the weak in mind can be magnetised. And lest, from some cause or other, individuals of the latter classes should resist the magnetic charm, the apostles of the science declare that there are times when even *they* cannot be acted upon; the presence of one scorner or unbeliever may weaken the potency of the fluid and destroy its efficacy. In M. Deleuze's instructions to a magnetiser, he expressly says, "Never magnetise before inquisitive persons!"⁷⁶

Here we conclude the subject, as it would serve no good purpose to extend to greater length the history of Animal Magnetism; especially at a time when many phenomena, the reality of which it is impossible to dispute, are daily occurring to startle and perplex the most learned, impartial, and truth-loving of mankind. Enough, however, has been stated to shew, that if there be some truth in magnetism, there has been much error, misconception, and exaggeration. Taking its history from the commencement, it can hardly be said to have been without its uses. To quote the words of Bailly, in 1784, "Magnetism has not been altogether unavailing to the philosophy which condemns it: it is an additional fact to record among the errors of the human mind, and a great experiment on the strength of the imagination." Over that vast inquiry of the influence of mind over matter,—an inquiry which the embodied intellect of mankind will never be able to fathom completely,—it will at least have thrown a feeble and imperfect light. It will have afforded an additional proof of the strength of the unconquerable will, and the weakness of matter as compared with it; another illustration of the words of the inspired Psalmist, that "we are fearfully and wonderfully made."



INFLUENCE OF POLITICS AND RELIGION ON THE HAIR AND BEARD.

Speak with respect and honour
Both of the beard and the beard's owner.

Hudibras.

THE famous declaration of St. Paul, "that long hair was a shame unto a man," has been made the pretext for many singular enactments, both of civil and ecclesiastical governments. The fashion of the hair and the cut of the beard were state questions in France and England, from the establishment of Christianity until the fifteenth century.

We find, too, that in much earlier times, men were not permitted to do as they liked with their own hair. Alexander the Great thought that the beards of the soldiery afforded convenient handles for the enemy to lay hold of, preparatory to cutting off their heads; and, with a view of depriving them of this advantage, he ordered the whole of his army to be closely shaven. His notions of courtesy towards an enemy were quite different from those entertained by the North American Indians, and amongst whom it is held a point of honour to allow one "chivalrous lock" to grow, that the foe, in taking the scalp, may have something to catch hold of.

At one time, long hair was the symbol of sovereignty in Europe. We learn from Gregory of Tours, that, among the successors of Clovis, it was the exclusive privilege of the royal family to have their hair long and curled. The nobles, equal to kings in power, would not shew any inferiority in this respect, and wore not only their hair, but their beards of an enormous

length. This fashion lasted, with but slight changes, till the time of Louis the Debonnaire; but his successors, up to Hugh Capet, wore their hair short, by way of distinction. Even the serfs had set all regulation at defiance, and allowed their locks and beards to grow.

At the time of the invasion of England by William the Conqueror, the Normans wore their hair very short. Harold, in his progress towards Hastings, sent forward spies to view the strength and number of the enemy. They reported, amongst other things, on their return, that “the host did almost seem to be priests, because they had all their face and both their lips shaven.” The fashion among the English at the time was to wear the hair long upon the head and the upper lip, but to shave the chin. When the haughty victors had divided the broad lands of the Saxon thanes and franklins among them, when tyranny of every kind was employed to make the English feel that they were indeed a subdued and broken nation, the latter encouraged the growth of their hair, that they might resemble as little as possible their cropped and shaven masters.

This fashion was exceedingly displeasing to the clergy, and prevailed to a considerable extent in France and Germany. Towards the end of the eleventh century, it was decreed by the pope, and zealously supported by the ecclesiastical authorities all over Europe, that such persons as wore long hair should be excommunicated while living, and not be prayed for when dead. William of Malmesbury relates, that the famous St. Wulstan, Bishop of Worcester, was peculiarly indignant whenever he saw a man with long hair. He declaimed against the practice as one highly immoral, criminal, and beastly. He continually carried a small knife in his pocket, and whenever any body offending in this respect knelt before him to receive his blessing, he would whip it out slyly, and cut off a handful, and then, throwing it in his face, tell him to cut off all the rest, or he would go to hell.

But fashion, which at times it is possible to move with a wisp, stands firm against a lever; and men preferred to run the risk of damnation to parting

with the superfluity of their hair. In the time of Henry I., Anselm, Archbishop of Canterbury, found it necessary to republish the famous decree of excommunication and outlawry against the offenders; but, as the court itself had begun to patronise curls, the fulminations of the Church were unavailing. Henry I. and his nobles wore their hair in long ringlets down their backs and shoulders, and became a *scandalum magnatum* in the eyes of the godly. One Serlo, the king's chaplain, was so grieved in spirit at the impiety of his master, that he preached a sermon from the well-known text of St. Paul before the assembled court, in which he drew so dreadful a picture of the torments that awaited them in the other world, that several of them burst into tears, and wrung their hair, as if they would have pulled it out by the roots. Henry himself was observed to weep. The priest, seeing the impression he had made, determined to strike while the iron was hot, and pulling a pair of scissors from his pocket, cut the king's hair in presence of them all. Several of the principal courtiers consented to do the like, and for a short time long hair appeared to be going out of fashion. But the courtiers thought, after the first glow of their penitence had been cooled by reflection, that the clerical Delilah had shorn them of their strength, and in less than six months they were as great sinners as ever.

Anselm, the Archbishop of Canterbury, who had been a monk of Bec, in Normandy, and who had signalised himself at Rouen by his fierce opposition to long hair, was still anxious to work a reformation in this matter. But his pertinacity was far from pleasing to the king, who had finally made up his mind to wear ringlets. There were other disputes, of a more serious nature, between them; so that when the archbishop died, the king was so glad to be rid of him, that he allowed the see to remain vacant for five years. Still the cause had other advocates, and every pulpit in the land resounded with anathemas against that disobedient and long-haired generation. But all was of no avail. Stowe, in writing of this period, asserts, on the authority of some more ancient chronicler, "that men, forgetting

their birth, transformed themselves, by the length of their haire, into the semblance of woman kind;” and that when their hair decayed from age, or other causes, “they knit about their heads certain rolls and braidings of false hair.” At last accident turned the tide of fashion. A knight of the court, who was exceedingly proud of his beauteous locks, dreamed one night that, as he lay in bed, the devil sprang upon him, and endeavoured to choke him with his own hair. He started in affright, and actually found that he had a great quantity of hair in his mouth. Sorely stricken in conscience, and looking upon the dream as a warning from heaven, he set about the work of reformation, and cut off his luxuriant tresses the same night. The story was soon bruited abroad; of course it was made the most of by the clergy, and the knight, being a man of influence and consideration, and the acknowledged leader of the fashion, his example, aided by priestly exhortations, was very generally imitated. Men appeared almost as decent as St. Wulstan himself could have wished, the dream of a dandy having proved more efficacious than the entreaties of a saint. But, as Stowe informs us, “scarcely was one year past, when all that thought themselves courtiers fell into the former vice, and contended with women in their long haire.” Henry, the king, appears to have been quite uninfluenced by the dreams of others, for even his own would not induce him a second time to undergo a cropping from priestly shears. It is said, that he was much troubled at this time by disagreeable visions. Having offended the Church in this and other respects, he could get no sound, refreshing sleep, and used to imagine that he saw all the bishops, abbots, and monks of every degree, standing around his bed-side, and threatening to belabour him with their pastoral staves; which sight, we are told, so frightened him, that he often started naked out of his bed, and attacked the phantoms sword in hand. Grimbalde, his physician, who, like most of his fraternity at that day, was an ecclesiastic, never hinted that his dreams were the result of a bad digestion, but told him to shave his head, be reconciled to the Church, and reform himself with alms and prayer. But he would not take this good

advice, and it was not until he had been nearly drowned a year afterwards, in a violent storm at sea, that he repented of his evil ways, cut his hair short, and paid proper deference to the wishes of the clergy.

In France, the thunders of the Vatican with regard to long curly hair were hardly more respected than in England. Louis VII., however, was more obedient than his brother-king, and cropped himself as closely as a monk, to the great sorrow of all the gallants of his court. His queen, the gay, haughty, and pleasure-seeking Eleanor of Guienne, never admired him in this trim, and continually reproached him with imitating, not only the head-dress, but the asceticism of the monks. From this cause a coldness arose between them. The lady proving at last unfaithful to her shaven and indifferent lord, they were divorced, and the kings of France lost the rich provinces of Guienne and Poitou, which were her dowry. She soon after bestowed her hand and her possessions upon Henry Duke of Normandy, afterwards Henry II. of England, and thus gave the English sovereigns that strong footing in France which was for so many centuries the cause of such long and bloody wars between the nations. When the Crusades had drawn all the smart young fellows into Palestine, the clergy did not find it so difficult to convince the staid burghers who remained in Europe, of the enormity of long hair. During the absence of Richard Cœur de Lion, his English subjects not only cut their hair close, but shaved their faces. William Fitz-osbert, or Long-beard, the great demagogue of that day, reintroduced among the people who claimed to be of Saxon origin the fashion of long hair. He did this with the view of making them as unlike as possible to the citizens and the Normans. He wore his own beard hanging down to his waist, from whence the name by which he is best known to posterity.

The Church never shewed itself so great an enemy to the beard as to long hair on the head. It generally allowed fashion to take its own course, both with regard to the chin and the upper lip. This fashion varied continually; for we find that, in little more than a century after the time of Richard I.,

when beards were short, that they had again become so long as to be mentioned in the famous epigram made by the Scots who visited London in 1327, when David, son of Robert Bruce, was married to Joan, the sister of King Edward. This epigram, which was stuck on the church-door of St. Peter Stangate, ran as follows:

“Long beards heartlesse,
Painted hoods witlesse,
Gray coats gracelesse,
Make England thriftlesse.”

When the Emperor Charles V. ascended the throne of Spain he had no beard. It was not to be expected that the obsequious parasites who always surround a monarch, could presume to look more virile than their master. Immediately all the courtiers appeared beardless, with the exception of such few grave old men as had outgrown the influence of fashion, and who had determined to die bearded as they had lived. Sober people in general saw this revolution with sorrow and alarm, and thought that every manly virtue would be banished with the beard. It became at the time a common saying,—

“Desde que no hay barba, no hay mas alma.”

We have no longer souls since we have lost our beards.

In France also the beard fell into disrepute after the death of Henry IV., from the mere reason that his successor was too young to have one. Some of the more immediate friends of the great Béarnais, and his minister Sully among the rest, refused to part with their beards, notwithstanding the jeers of the new generation.

Who does not remember the division of England into the two great parties of Roundheads and Cavaliers? In those days every species of vice

and iniquity was thought by the Puritans to lurk in the long curly tresses of the monarchists, while the latter imagined that their opponents were as destitute of wit, of wisdom, and of virtue, as they were of hair. A man's locks were the symbol of his creed, both in politics and religion. The more abundant the hair, the more scant the faith; and the balder the head, the more sincere the piety.



PETER THE GREAT.

But among all the instances of the interference of governments with men's hair, the most extraordinary, not only for its daring, but for its success, is that of Peter the Great, in 1705. By this time fashion had condemned the beard in every other country in Europe, and with a voice more potent than popes or emperors, had banished it from civilised society. But this only made the Russians cling more fondly to their ancient ornament, as a mark to distinguish them from foreigners, whom they hated. Peter, however, resolved that they should be shaven. If he had been a man deeply read in history, he might have hesitated before he attempted so despotic an attack upon the time-hallowed customs and prejudices of his countrymen; but he was not. He did not know or consider the danger of the innovation; he only listened to the promptings of his own indomitable will, and his fiat went forth, that not only the army, but all ranks of citizens, from the nobles to the serfs, should shave their beards. A certain time was given, that people might get over the first throes of their repugnance, after which every man who chose to retain his beard was to pay a tax of one hundred roubles. The priests and the serfs were put on a lower footing, and

allowed to retain theirs upon payment of a copeck every time they passed the gate of a city. Great discontent existed in consequence, but the dreadful fate of the Strelitzes was too recent to be forgotten, and thousands who had the will had not the courage to revolt. As is well remarked by a writer in the *Encyclopædia Britannica*, they thought it wiser to cut off their beards than to run the risk of incensing a man who would make no scruple in cutting off their heads. Wiser, too, than the popes and bishops of a former age, he did not threaten them with eternal damnation, but made them pay in hard cash the penalty of their disobedience. For many years, a very considerable revenue was collected from this source. The collectors gave in receipt for its payment a small copper coin, struck expressly for the purpose, and called the "*borodováia*," or "the bearded." On one side it bore the figure of a nose, mouth, and moustaches, with a long bushy beard, surmounted by the words, "*Deuyee Vyeatee*," "money received;" the whole encircled by a wreath, and stamped with the black eagle of Russia. On the reverse, it bore the date of the year. Every man who chose to wear a beard was obliged to produce this receipt on his entry into a town. Those who were refractory, and refused to pay the tax, were thrown into prison.

Since that day, the rulers of modern Europe have endeavoured to persuade, rather than to force, in all matters pertaining to fashion. The Vatican troubles itself no more about beards or ringlets, and men may become hairy as bears, if such is their fancy, without fear of excommunication or deprivation of their political rights. Folly has taken a new start, and cultivates the moustache.

Even upon this point governments will not let men alone. Religion as yet has not meddled with it; but perhaps it will; and politics already influence it considerably. Before the revolution of 1830, neither the French nor Belgian citizens were remarkable for their moustaches; but, after that event, there was hardly a shopkeeper either in Paris or Brussels whose upper lip did not suddenly become hairy with real or mock moustaches. During a temporary triumph gained by the Dutch soldiers over the citizens

of Louvain, in October 1830, it became a standing joke against the patriots, that they shaved their faces clean immediately; and the wits of the Dutch army asserted that they had gathered moustaches enough from the denuded lips of the Belgians to stuff mattresses for all the sick and wounded in their hospital.

The last folly of this kind is still more recent. In the German newspapers, of August 1838, appeared an ordonnance, signed by the king of Bavaria, forbidding civilians, on any pretence whatever, to wear moustaches, and commanding the police and other authorities to arrest, and cause to be shaved, the offending parties. "Strange to say," adds *Le Droit*, the journal from which this account is taken, "moustaches disappeared immediately, like leaves from the trees in autumn; every body made haste to obey the royal order, and not one person was arrested."

The king of Bavaria, a rhymester of some celebrity, has taken a good many poetical licences in his time. His licence in this matter appears neither poetical nor reasonable. It is to be hoped that he will not take it into his royal head to make his subjects shave theirs; nothing but that is wanting to complete their degradation.



BAYEUX TAPESTRY.⁷⁷

Footnotes

1. Miss Elizabeth Villiers, afterwards Countess of Orkney.
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2. The wits of the day called it a *sand-bank*, which would wreck the vessel of the state.
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3. This anecdote, which is related in the correspondence of Madame de Bavière, Duchess of Orleans and mother of the Regent, is discredited by Lord John Russell in his *History of the principal States of Europe from the Peace of Utrecht*; for what reason he does not inform us. There is no doubt that Law proposed his scheme to Desmarets, and that Louis refused to hear of it. The reason given for the refusal is quite consistent with the character of that bigoted and tyrannical monarch.
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4. From *maltôte*, an oppressive tax.
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5. This anecdote is related by M. de la Hode, in his *Life of Philippe of Orleans*. It would have looked more authentic if he had given the names of the dishonest contractor and the still more dishonest minister. But M. de la Hode's book is liable to the same objection as most of the French memoirs of that and of subsequent periods. It is sufficient with most of them that an anecdote be *ben trovato*; the *vero* is but matter of secondary consideration.
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6. The French pronounced his name in this manner to avoid the ungallic sound, *aw*. After the failure of his scheme, the wags said the nation was *lasse de lui*, and proposed that he should in future be known by the name of Monsieur Helas!

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7. The curious reader may find an anecdote of the eagerness of the French ladies to retain Law in their company, which will make him blush or smile according as he happens to be very modest or the reverse. It is related in the *Letters of Madame Charlotte Elizabeth de Bavière, Duchess of Orleans*, vol. ii. p. 274.

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8. The following squib was circulated on the occasion:

“Foin de ton zèle séraphique,
Malheureux Abbé de Tencin,
Depuis que Law est Catholique,
Tout le royaume est Capucin!”

Thus somewhat weakly and paraphrastically rendered by Justandson, in his translation of the *Memoirs of Louis XV.*:

“Tencin, a curse on thy seraphic zeal,
Which by persuasion hath contrived the means
To make the Scotchman at our altars kneel,
Since which we all are poor as Capucines!”

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9. From a print in a Dutch collection of satirical prints relating to the Mississippi Mania, entitled “Het groote Tafereel der Dwaasheid;” or, The great picture of Folly. The print of Atlas is styled, “L’Atlas actieux de Papier.” Law is calling in Hercules to aid him in supporting the globe. Quoted in Wright’s *England under the House of Hanover*.

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10. The Duke de la Force gained considerable sums, not only by jobbing in the stocks, but in dealing in porcelain, spices, &c. It was debated for a length of time in the parliament of Paris whether he had not, in his quality of spice-merchant, forfeited his rank in the peerage. It was

decided in the negative. A caricature of him was made, dressed as a street-porter, carrying a large bale of spices on his back, with the inscription, “Admirez LA FORCE.”

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11. “Lucifer’s New Row-Barge” exhibits Law in a barge, with a host of emblematic figures representing the Mississippi follies.—*From a Print in Mr. Hawkins’ Collection.*

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12. Duclos, *Memoires Secrets de la Régence.*

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13. The Duchess of Orleans gives a different version of this story; but whichever be the true one, the manifestation of such feeling in a legislative assembly was not very creditable. She says that the president was so transported with joy, that he was seized with a rhyming fit, and, returning into the hall, exclaimed to the members:

*“Messieurs! Messieurs! bonne nouvelle!
Le carrosse de Lass est reduit en cannelle!”*

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14. Law in a car drawn by cocks; from *Het groote Tofereel der Dwaasheid.*

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15. Neck or nothing, or downfall of the Mississippi Company.—*From a Print in Mr. Hawkins’ Collection.*

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16. *A South-Sea Ballad; or, Merry Remarks upon Exchange-Alley Bubbles. To a new Tune called “The Grand Elixir; or, the Philosopher’s Stone discovered.”*

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17. Coxe’s *Walpole*, Correspondence between Mr. Secretary Craggs and Earl Stanhope.

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18. Stock-jobbing Card, or the humours of Change Alley. Copied from a print called *Bubblers’ Medley*, published by Carrington Bowles.

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19. Tree, surrounded by water; people climbing up the tree. One of a series of bubble cards, copied from the *Bubblers' Medley*, published by Carrington Bowles.

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20. Gay (the poet), in that disastrous year, had a present from young Craggs of some South-Sea stock, and once supposed himself to be master of twenty thousand pounds. His friends persuaded him to sell his share, but he dreamed of dignity and splendour, and could not hear to obstruct his own fortune. He was then importuned to sell as much as would purchase a hundred a year for life, "which," says Fenton, "will make you sure of a clean shirt and a shoulder of mutton every day." This counsel was rejected; the profit and principal were lost, and Gay sunk under the calamity so low that his life became in danger.—*Johnson's Lives of the Poets*

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21. Smollett.

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22. Caricature, copied from *Bubblers' Medley*, published by Carrington Bowles.

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23. Britannia stript by a South-Sea Director. From *Het groote Tafereel der Dwaasheid*.

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24. "God cannot love,' says Blunt, with tearless eyes,
'The wretch he starves, and piously denies.' ...
Much-injur'd Blunt! why bears he Britain's hate?
A wizard told him in these words our fate:
'At length corruption, like a gen'ral flood,
So long by watchful ministers withstood,
Shall deluge all; and av'rice, creeping on,
Spread like a low-born mist, and blot the sun;
Statesman and patriot ply alike the stocks,
Peeress and butler share alike the box,

And judges job, and bishops bite the Town,
And mighty dukes pack cards for half-a-crown:
See Britain sunk in Lucre's forbid charms,
And France reveng'd of Ann's and Edward's arms!
'Twas no court-badge, great Scriv'ner! fir'd thy brain,
Nor lordly luxury, nor city gain:
No, 'twas thy righteous end, asham'd to see
Senates degen'rate, patriots disagree,
And nobly wishing party-rage to cease,
To buy both sides, and give thy country peace."

Pope's Epistle to Allen Lord Bathurst.

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25. The Brabant Screen. This caricature represents the Duchess of Kendal behind the "Brabant Screen," supplying Mr. Knight with money to facilitate his escape; and is copied from a rare print of the time, in the collection of E. Hawkins, Esq. F.S.A.

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26. Emblematic print of the South-Sea Scheme. By W. Hogarth.

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27. The South-Sea project remained until 1845 the greatest example in British history of the infatuation of the people for commercial gambling. The first edition of these volumes was published some time before the outbreak of the Great Railway Mania of that and the following year.

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28. *Biographie Universelle.*

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29. His sum "of perfection," or instructions to students to aid them in the laborious search for the stone and elixir, has been translated into most of the languages of Europe. An English translation, by a great enthusiast in alchymy, one Richard Russell, was published in London in 1686. The preface is dated eight years previously from the house of the alchymist, "at the Star, in Newmarket, in Wapping, near the Dock." His design in undertaking the translation was, as he informs us, to expose the false

pretences of the many ignorant pretenders to the science who abounded in his day.

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30. Article, Geber, *Biographie Universelle*.

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31. Naudé, *Apologie des Grands Hommes accusés de Magie*, chap. xviii.

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32. Lenglet, *Histoire de la Philosophie Hermétique*. See also Godwin's *Lives of the Necromancers*.

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33. Naudé, *Apologie des Grands Hommes accusés de Magie*, chap. xvii.

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34. Vidimus omnia ista dum ad Angliam transiimus, propter intercessionem domini Regis Edoardi illustrissimi.

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35. Converti una vice in aurum ad L millia pondo argenti vivi, plumbi, et stanni.—*Lullii Testamentum*.

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36. These verses are but a coarser expression of the slanderous line of Pope, that “every woman is at heart a rake.”

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37. Fuller's *Worthies of England*.

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38. *Biographie Universelle*.

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39. For full details of this extraordinary trial, see Lobineau's *Nouvelle Histoire de Bretagne*, and D'Argentré's work on the same subject. The character and life of Gilles de Rays are believed to have suggested the famous Blue Beard of the nursery tale.

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40. See the article “Paracelsus,” by the learned Renaudin, in the *Biographie Universelle*.

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41. The “crystal” alluded to appears to have been a black stone, or piece of polished coal. The following account of it is given, in the supplement to Granger’s *Biographical History*. “The black stone into which Dee used to call his spirits was in the collection of the Earls of Peterborough, from whence it came to Lady Elizabeth Germaine. It was next the property of the late Duke of Argyle, and is now Mr. Walpole’s. It appears upon examination to be nothing more than a polished piece of cannel coal; but this is what Butler means when he says,

‘Kelly did all his feats upon
The devil’s looking-glass—a stone.’”

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42. Lilly the astrologer, in his *Life*, written by himself, frequently tells of prophecies delivered by the angels in a manner similar to the angels of Dr. Dee. He says, “The prophecies were not given vocally by the angels, but by inspection of the crystal in types and figures, or by apparition the circular way; where, at some distance, the angels appear, representing by forms, shapes, and creatures, what is demanded. It is very rare, yea even in our days,” quoth that wiseacre, “for any operator or master to hear the angels speak articulately: when they do speak, *it is like, the Irish, much in the throat!*”

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43. Albert Laski, son of Jaroslav, was Palatine of Siradz, and afterwards of Sendomir, and chiefly contributed to the election of Henry of Valois, the Third of France, to the throne of Poland, and was one of the delegates who went to France in order to announce to the new monarch his elevation to the sovereignty of Poland. After the deposition of Henry, Albert Laski voted for Maximilian of Austria. In 1583 he visited England, when Queen Elizabeth received him with great distinction. The honours which were shewn him during his visit to Oxford, by the especial command of the Queen, were equal to those rendered to sovereign princes. His extraordinary prodigality rendered his enormous wealth insufficient to defray his expenses, and he therefore became a zealous

adept in alchemy, and took from England to Poland with him two known alchemists.—Count Valerian Krasinski's *Historical Sketch of the Reformation in Poland*.

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44. The following legend of the tomb of Rosencreutz, written by Eustace Budgell, appears in No. 379 of the *Spectator*:—"A certain person, having occasion to dig somewhat deep in the ground where this philosopher lay interred, met with a small door, having a wall on each side of it. His curiosity, and the hope of finding some hidden treasure, soon prompted him to force open the door. He was immediately surprised by a sudden blaze of light, and discovered a very fair vault. At the upper end of it was a statue of a man in armour, sitting by a table, and leaning on his left arm. He held a truncheon in his right hand, and had a lamp burning before him. The man had no sooner set one foot within the vault, than the statue, erecting itself from its leaning posture, stood bolt upright; and, upon the fellow's advancing another step, lifted up the truncheon in his right hand. The man still ventured a third step; when the statue, with a furious blow, broke the lamp into a thousand pieces, and left his guest in sudden darkness. Upon the report of this adventure, the country people came with lights to the sepulchre, and discovered that the statue, which was made of brass, was nothing more than a piece of clock-work; that the floor of the vault was all loose, and underlaid with several springs, which, upon any man's entering, naturally produced that which had happened.

"Rosicreucius, say his disciples, made use of this method to shew the world that he had re-invented the ever-burning lamps of the ancients, though he was resolved no one should reap any advantage from the discovery."

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45. No. 574. Friday, July 30th, 1714.

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46. "Vitulus Aureus quem Mundus adorat et orat, in quo tractatur de naturæ miraculo transmutandi metalla." *Hagæ*, 1667.

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47. *Voyages de Monconis*, tome ii. p. 379.

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48. See the Abbé Fiard, and *Anecdotes of the Reign of Louis XVI.* p. 400.

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49. *Biographie des Contemporains*, article “Cagliostro.” See also *Histoire de la Magie en France*, par M. Jules Garinet, p. 284.

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50. The enemies of the unfortunate Queen of France, when the progress of the Revolution embittered their animosity against her, maintained that she was really a party in this transaction; that she, and not Mademoiselle D’Oliva, met the cardinal and rewarded him with the flower; and that the story above related was merely concocted between her La Motte, and others to cheat the jeweller of his 1,600,000 francs.

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51. See Gibbon and Voltaire for further notice of this subject.

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52. *Charlemagne: Poëme épique par Lucien Buonaparte.*

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53. This prophecy seems to have been that set forth at length in the popular *Life of Mother Shipton*:

“When fate to England shall restore
A king to reign as heretofore,
Great death in London shall be though,
And many houses be laid low.”

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54. The *London Saturday Journal* of March 12th, 1842, contains the following:—“An absurd report is gaining ground among the weak-minded, that London will be destroyed by an earthquake on the 17th of March, or St. Patrick’s day. This rumour is founded on the following ancient prophecies: one professing to be pronounced in the year 1203; the other, by Dr. Dee the astrologer, in 1598:

“In eighteen hundred and forty-two
Four things the sun shall view;
London’s rich and famous town

Hungry earth shall swallow down.
Storm and rain in France shall be,
Till every river runs a sea.
Spain shall be rent in twain,
And famine waste the land again.
So say I, the Monk of Dree,
In the twelve hundredth year and three.”

Harleian Collection (British Museum), 800 b, fol. 319.

“The Lord have mercy on you all—
Prepare yourselves for dreadful fall
Of house and land and human soul—
The measure of your sins is full.
In the year one, eight, and forty-two,
Of the year that is so new;
In the third month of that sixteen,
It may be a day or two between—
Perhaps you’ll soon be stiff and cold.
Dear Christian, be not stout and bold—
The mighty, kingly-proud will see
This comes to pass as my name’s Dee.”

1598. *Ms.*, in the British Museum.

The alarm of the population of London did not on this occasion extend beyond the wide circle of the uneducated classes, but among them it equalled that recorded in the text. It was soon afterwards stated that no such prophecy is to be found in the Harleian *Ms.*

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55. *Chronicles of England*, by Richard Grafton; London, 1568, p. 106.

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56. *Faerie Queene*, b. 3, c. 3, s. 6-13.

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57. Although other places claim the honour(!) of Mother Shipton’s birth, her residence is asserted, by oral tradition, to have been for many years a cottage at Winslow-cum-Shipton, in Buckinghamshire, of which the above is a representation. We give the contents of one of the popular books containing her prophecies:

The Strange and Wonderful History and Prophecies of Mother Shipton, plainly setting forth her Birth, Life, Death, and Burial. 12mo, Newcastle. Chap. 1.—Of her birth and parentage. 2. How Mother Shipton’s mother proved with child; how she fitted the justice, and what happened at her delivery. 3. By what name Mother Shipton was christened, and how her mother went into a monastery. 4. Several other pranks play’d by Mother Shipton in revenge of such as abused her. 5. How Ursula married a young man named Tobias Shipton, and how strangely she discovered a thief. 6. Her prophecy against Cardinal Wolsey. 7. Some other prophecies of Mother Shipton relating to those times. 8. Her prophecies in verse to the Abbot of Beverly. 9. Mother Shipton’s life, death, and burial.

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58. Let us try. In his second century, prediction 66, he says:

“From great dangers the captive is escaped.
A little time, great fortune changed.
In the palace the people are caught.
By good augury the city is besieged.”

“What is this,” a believer might exclaim, “but the escape of Napoleon from Elba—his changed fortune, and the occupation of Paris by the allied armies?”

Let us try again. In his third century, prediction 98, he says:

“Two royal brothers will make fierce war on each other;
So mortal shall be the strife between them,
That each one shall occupy a fort against the other;
For their reign and life shall be the quarrel.”

Some Lillius Redivivus would find no difficulty in this prediction. To use a vulgar phrase, it is as clear as a pikestaff. Had not the astrologer in view Don Miguel and Don Pedro when he penned this stanza, so much less obscure and oracular than the rest?

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59. *Hermippus Redivivus*, p. 142.

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60. *Jovii Elog.* p. 320.

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61. *Les Anecdotes de Florence, ou l'Histoire secrète de la Maison di Medicis*, p. 318.

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62. It is quite astonishing to see the great demand there is, both in England and France, for dream-books, and other trash of the same kind. Two books in England enjoy an extraordinary popularity, and have run through upwards of fifty editions in as many years in London alone, besides being reprinted in Manchester, Edinburgh, Glasgow, and Dublin. One is *Mother Bridget's Dream-book and Oracle of Fate*; the other is the *Norwood Gipsy*. It is stated, on the authority of one who is curious in these matters, that there is a demand for these works, which are sold at sums varying from a penny to sixpence, chiefly to servant-girls and imperfectly-educated people, all over the country, of upwards of eleven thousand annually; and that at no period during the last thirty years has the average number sold been less than this. The total number during this period would thus amount to 330,000.

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63. *Spectator*, No. 7, March 8, 1710-11.

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64. See Van der Mye's account of the siege of Breda. The garrison, being afflicted with scurvy, the Prince of Orange sent the physicians two or three small phials, containing a decoction of camomile, wormwood, and camphor, telling them to pretend that it was a medicine of the greatest value and extremest rarity, which had been procured with very much danger and difficulty from the East; and so strong, that two or three drops would impart a healing virtue to a gallon of water. The soldiers had faith in their commander; they took the medicine with cheerful faces, and grew well rapidly. They afterwards thronged about the prince in groups of twenty and thirty at a time, praising his skill, and loading him with protestations of gratitude.

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65. Mummies were of several kinds, and were all of great use in magnetic medicines. Paracelsus enumerates six kinds of mummies; the first four only differing in the composition used by different people for preserving

their dead, are the Egyptian, Arabian, Pisasphaltos, and Libyan. The fifth mummy of peculiar power was made from criminals that had been hanged; “for from such there is a gentle siccation, that expungeth the watery humour, without destroying the oil and spirituall, which is cherished by the heavenly luminaries, and strengthened continually by the affluence and impulses of the celestial spirits; whence it may be properly called by the name of constellated or celestial mummie.” The sixth kind of mummy was made of corpuscles, or spiritual effluences, radiated from the living body; though we cannot get very clear ideas on this head, or respecting the manner in which they were caught.—*Medicina Diatastica; or, Sympathetical Mummie, abstracted from the Works of Paracelsus, and translated out of the Latin*, by Fernando Parkhurst, Gent. London, 1653, pp. 2, 7. Quoted by the *Foreign Quarterly Review*, vol. xii, p. 415.

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66. Reginald Scott, quoted by Sir Walter Scott, in the notes to the *Lay of the last Minstrel*, c. iii, v. xxiii.

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67. Greatraks’ Account of himself, in a letter to the Honourable Robert Boyle.

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68. *Introduction to the Study of Animal Magnetism*, by Baron Dupotet de Sennevoy, p. 315.

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69. *Introduction to the Study of Animal Magnetism*, p. 318.

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70. *Dictionnaire des Sciences Médicales—Article Convulsionnaires*, par Montégre.

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71. An enthusiastic philosopher, of whose name we are not informed, had constructed a very satisfactory theory on some subject or other, and was not a little proud of it. “But the facts, my dear fellow,” said his friend, “the facts do not agree with your theory.”—“Don’t they?” replied the

philosopher, shrugging his shoulders, “then, *tant pis pour les faits*;”—so much the worse for the facts!

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72. *Rapport des Commissaires*, rédigé par M. Bailly. Paris, 1784.

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73. *Introduction to the Study of Animal Magnetism*, by Baron Dupotet, p. 73.

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74. See *Foreign Review and Continental Miscellany*, vol. v, p. 113.

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75. See the very clear, and dispassionate article upon the subject in the fifth volume (1830) of *The Foreign Review*, p. 96 et seq.

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76. *Histoire Critique du Magnétisme Animal*, p. 60.

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77. The above engraving, shewing two soldiers of William the Conqueror’s army, is taken from the celebrated Bayeux Tapestry.—See *ante*, p. 297.

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POPE URBAN PREACHING THE CRUSADES

MEMOIRS
OF
EXTRAORDINARY POPULAR DELUSIONS.
VOLUME II.



VIEW IN THE THE HARZ MOUNTAINS.

LONDON:
OFFICE OF THE NATIONAL ILLUSTRATED LIBRARY,
227 STRAND.
1852.

MEMOIRS
OF
EXTRAORDINARY POPULAR
DELUSIONS
AND THE
Madness of Crowds.

BY CHARLES MACKAY, LL.D.
AUTHOR OF "EGERIA," "THE SALAMANDRINE," ETC.
ILLUSTRATED WITH NUMEROUS ENGRAVINGS.

VOL. II.

N'en déplaie à ces fous nommés sages de Grèce,
En ce monde il n'est point de parfaite sagesse;
Tous les hommes sont fous, et malgré tous leurs
soîns
Ne diffèrent entre eux que du plus ou du moins.

BOILEAU.

LONDON:
OFFICE OF THE NATIONAL ILLUSTRATED LIBRARY,
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1852.

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MEMOIRS
OF
EXTRAORDINARY POPULAR DELUSIONS.

THE CRUSADES.

They heard, and up they sprang upon the wing
Innumerable. As when the potent rod
Of Amram's son, in Egypt's evil day,
Waved round the coast, up call'd a pitchy cloud
Of locusts, warping on the eastern wind
That o'er the realm of impious Pharaoh hung
Like night, and darken'd all the realm of Nile,
So numberless were they. * * * *
All in a moment through the gloom were seen
Ten thousand banners rise into the air,
With orient colours waving. With them rose
A forest huge of spears; and thronging helms
Appear'd, and serried shields, in thick array,
Of depth immeasurable.

Paradise Lost.



EVERY age has its peculiar folly; some scheme, project, or phantasy into which it plunges, spurred on either by the love of gain, the necessity of excitement, or the mere force of imitation. Failing in these, it has some madness, to which it is goaded by political or religious causes, or both combined. Every one of these causes influenced the Crusades, and conspired to render them the most extraordinary instance upon record of the extent to which popular enthusiasm can be carried. History in her solemn page informs us, that the Crusaders were but ignorant and savage

men, that their motives were those of bigotry unmitigated, and that their pathway was one of blood and tears. Romance, on the other hand, dilates upon their piety and heroism, and portrays, in her most glowing and impassioned hues, their virtue and magnanimity, the imperishable honour they acquired for themselves, and the great services they rendered to Christianity. In the following pages we shall ransack the stores of both, to discover the true spirit that animated the motley multitude who took up arms in the service of the cross, leaving history to vouch for facts, but not disdaining the aid of contemporary poetry and romance, to throw light upon feelings, motives, and opinions.

In order to understand thoroughly the state of public feeling in Europe at the time when Peter the Hermit preached the holy war, it will be necessary to go back for many years anterior to that event. We must make acquaintance with the pilgrims of the eighth, ninth, and tenth centuries, and learn the tales they told of the dangers they had passed and the wonders they had seen. Pilgrimages to the Holy Land seem at first to have been undertaken by converted Jews, and by Christian devotees of lively imagination, pining with a natural curiosity to visit the scenes which of all others were most interesting in their eyes. The pious and the impious alike flocked to Jerusalem,—the one class to feast their sight on the scenes hallowed by the life and sufferings of their Lord, and the other, because it soon became a generally received opinion, that such a pilgrimage was sufficient to rub off the long score of sins, however atrocious. Another and very numerous class of pilgrims were the idle and roving, who visited Palestine then as the moderns visit Italy or Switzerland now, because it was the fashion, and because they might please their vanity by retailing, on their return, the adventures they had met with. But the really pious formed the great majority. Every year their numbers increased, until at last they became so numerous as to be called the “armies of the Lord.” Full of enthusiasm, they set the dangers and difficulties of the way at defiance, and lingered with holy rapture on every scene described by the Evangelists. To

them it was bliss indeed to drink the clear waters of the Jordan, or be baptised in the same stream where John had baptised the Saviour. They wandered with awe and pleasure in the purlieu of the Temple, on the solemn Mount of Olives, or the awful Calvary, where a God had bled for sinful men. To these pilgrims every object was precious. Relics were eagerly sought after; flagons of water from Jordan, or panniers of mould from the hill of the Crucifixion, were brought home, and sold at extravagant prices to churches and monasteries. More apocryphal relics, such as the wood of the true cross, the tears of the Virgin Mary, the hems of her garments, the toe-nails and hair of the Apostles—even the tents that Paul had helped to manufacture—were exhibited for sale by the knavish in Palestine, and brought back to Europe “with wondrous cost and care.” A grove of a hundred oaks would not have furnished all the wood sold in little morsels as remnants of the true cross; and the tears of Mary, if collected together, would have filled a cistern.

For upwards of two hundred years the pilgrims met with no impediment in Palestine. The enlightened Haroun Al Reschid, and his more immediate successors, encouraged the stream which brought so much wealth into Syria, and treated the wayfarers with the utmost courtesy. The race of Fatemite caliphs,—who, although in other respects as tolerant, were more distressed for money, or more unscrupulous in obtaining it, than their predecessors of the house of Abbas,—imposed a tax of a bezant for each pilgrim that entered Jerusalem. This was a serious hardship upon the poorer sort, who had begged their weary way across Europe, and arrived at the bourne of all their hopes without a coin. A great outcry was immediately raised, but still the tax was rigorously levied. The pilgrims unable to pay were compelled to remain at the gate of the holy city until some rich devotee arriving with his train, paid the tax and let them in. Robert of Normandy, father of William the Conqueror, who, in common with many other nobles of the highest rank, undertook the pilgrimage,

found on his arrival scores of pilgrims at the gate, anxiously expecting his coming to pay the tax for them. Upon no occasion was such a boon refused.

The sums drawn from this source were a mine of wealth to the Moslem governors of Palestine, imposed as the tax had been at a time when pilgrimages had become more numerous than ever. A strange idea had taken possession of the popular mind at the close of the tenth and commencement of the eleventh century. It was universally believed that the end of the world was at hand; that the thousand years of the Apocalypse were near completion, and that Jesus Christ would descend upon Jerusalem to judge mankind. All Christendom was in commotion. A panic terror seized upon the weak, the credulous, and the guilty, who in those days formed more than nineteen-twentieths of the population. Forsaking their homes, kindred, and occupation, they crowded to Jerusalem to await the coming of the Lord, lightened, as they imagined, of a load of sin by their weary pilgrimage. To increase the panic, the stars were observed to fall from heaven, earthquakes to shake the land, and violent hurricanes to blow down the forests. All these, and more especially the meteoric phenomena, were looked upon as the forerunners of the approaching judgments. Not a meteor shot athwart the horizon that did not fill a district with alarm, and send away to Jerusalem a score of pilgrims, with staff in hand and wallet on their back, praying as they went for the remission of their sins. Men, women, and even children, trudged in droves to the holy city, in expectation of the day when the heavens would open, and the Son of God descend in his glory. This extraordinary delusion, while it augmented the numbers, increased also the hardships of the pilgrims. Beggars became so numerous on all the highways between the west of Europe and Constantinople, that the monks, the great almsgivers upon these occasions, would have brought starvation within sight of their own doors, if they had not economised their resources, and left the devotees to shift for themselves as they could. Hundreds of them were glad to subsist

upon the berries that ripened by the road, who, before this great flux, might have shared the bread and flesh of the monasteries.

But this was not the greatest of their difficulties. On their arrival in Jerusalem they found that a sterner race had obtained possession of the Holy Land. The caliphs of Bagdad had been succeeded by the harsh Turks of the race of Seljook, who looked upon the pilgrims with contempt and aversion. The Turks of the eleventh century were more ferocious and less scrupulous than the Saracens of the tenth. They were annoyed at the immense number of pilgrims who overran the country, and still more so because they shewed no intention of quitting it. The hourly expectation of the last judgment kept them waiting; and the Turks, apprehensive of being at last driven from the soil by the swarms that were still arriving, heaped up difficulties in their way. Persecution of every kind awaited them. They were plundered, and beaten with stripes, and kept in suspense for months at the gates of Jerusalem, unable to pay the golden bezant that was to procure them admission.

When the first epidemic terror of the day of judgment began to subside, a few pilgrims ventured to return to Europe, their hearts big with indignation at the insults they had suffered. Every where as they passed they related to a sympathising auditory the wrongs of Christendom. Strange to say, even these recitals increased the mania for pilgrimage. The greater the dangers of the way, the fairer chance that sins of deep dye would be atoned for. Difficulty and suffering only heightened the merit, and fresh hordes issued from every town and village, to win favour in the sight of heaven by a visit to the holy sepulchre. Thus did things continue during the whole of the eleventh century.

The train that was to explode so fearfully was now laid, and there wanted but the hand to apply the torch. At last the man appeared upon the scene. Like all who have ever achieved so great an end, Peter the Hermit was exactly suited to the age; neither behind it nor in advance of it; but acute enough to penetrate its mystery ere it was discovered by any other.

Enthusiastic, chivalrous, bigoted, and, if not insane, not far removed from insanity, he was the very prototype of the time. True enthusiasm is always persevering and always eloquent, and these two qualities were united in no common degree in the person of this extraordinary preacher. He was a monk of Amiens, and ere he assumed the hood had served as a soldier. He is represented as having been ill favoured and low in stature, but with an eye of surpassing brightness and intelligence. Having been seized with the mania of the age, he visited Jerusalem, and remained there till his blood boiled to see the cruel persecution heaped upon the devotees. On his return home he shook the world by the eloquent story of their wrongs.

Before entering into any further details of the marvellous results of his preaching, it will be advisable to cast a glance at the state of the mind of Europe, that we may understand all the better the causes of his success. First of all, there was the priesthood, which, exercising as it did the most conspicuous influence upon the fortunes of society, claims the largest share of attention. Religion was the ruling idea of that day, and the only civiliser capable of taming such wolves as then constituted the flock of the faithful. The clergy were all in all; and though they kept the popular mind in the most slavish subjection with regard to religious matters, they furnished it with the means of defence against all other oppression except their own. In the ecclesiastical ranks were concentrated all the true piety, all the learning, all the wisdom of the time; and, as a natural consequence, a great portion of power, which their very wisdom perpetually incited them to extend. The people knew nothing of kings and nobles, except in the way of injuries inflicted. The first ruled for, or more properly speaking against, the barons, and the barons only existed to brave the power of the kings, or to trample with their iron heels upon the neck of prostrate democracy. The latter had no friend but the clergy, and these, though they necessarily instilled the superstition from which they themselves were not exempt, yet taught the cheering doctrine that all men were equal in the sight of heaven. Thus, while Feudalism told them they had no rights in this world, Religion

told them they had every right in the next. With this consolation they were for the time content, for political ideas had as yet taken no root. When the clergy, for other reasons, recommended the Crusade, the people joined in it with enthusiasm. The subject of Palestine filled all minds; the pilgrims' tales of two centuries warmed every imagination; and when their friends, their guides, and their instructors preached a war so much in accordance with their own prejudices and modes of thinking, the enthusiasm rose into a frenzy.

But while religion inspired the masses, another agent was at work upon the nobility. These were fierce and lawless; tainted with every vice, endowed with no virtue, and redeemed by one good quality alone, that of courage. The only religion they felt was the religion of fear. That and their overboiling turbulence alike combined to guide them to the Holy Land. Most of them had sins enough to answer for. They lived with their hand against every man, and with no law but their own passions. They set at defiance the secular power of the clergy; but their hearts quailed at the awful denunciations of the pulpit with regard to the life to come. War was the business and the delight of their existence; and when they were promised remission of all their sins upon the easy condition of following their favourite bent, it is not to be wondered at that they rushed with enthusiasm to the onslaught, and became as zealous in the service of the cross as the great majority of the people, who were swayed by more purely religious motives. Fanaticism and the love of battle alike impelled them to the war, while the kings and princes of Europe had still another motive for encouraging their zeal. Policy opened their eyes to the great advantages which would accrue to themselves by the absence of so many restless, intriguing, and bloodthirsty men, whose insolence it required more than the small power of royalty to restrain within due bounds. Thus every motive was favourable to the Crusades. Every class of society was alike incited to join or encourage the war: kings and the clergy by policy, the nobles by turbulence and the love of dominion, and the people by religious

zeal and the concentrated enthusiasm of two centuries, skilfully directed by their only instructors.

It was in Palestine itself that Peter the Hermit first conceived the grand idea of rousing the powers of Christendom to rescue the Christians of the East from the thralldom of the Mussulmans, and the sepulchre of Jesus from the rude hands of the infidel. The subject engrossed his whole mind. Even in the visions of the night he was full of it. One dream made such an impression upon him, that he devoutly believed the Saviour of the world himself appeared before him, and promised him aid and protection in his holy undertaking. If his zeal had ever wavered before, this was sufficient to fix it for ever.

Peter, after he had performed all the penances and duties of his pilgrimage, demanded an interview with Simeon, the Patriarch of the Greek Church at Jerusalem. Though the latter was a heretic in Peter's eyes, yet he was still a Christian, and felt as acutely as himself for the persecutions heaped by the Turks upon the followers of Jesus. The good prelate entered fully into his views, and, at his suggestion, wrote letters to the Pope, and to the most influential monarchs of Christendom, detailing the sorrows of the faithful, and urging them to take up arms in their defence. Peter was not a laggard in the work. Taking an affectionate farewell of the Patriarch, he returned in all haste to Italy. Pope Urban II. occupied the apostolic chair. It was at that time far from being an easy seat. His predecessor Gregory had bequeathed him a host of disputes with the Emperor Henry IV. of Germany, and he had converted Philip I. of France into an enemy by his strenuous opposition to an adulterous connexion formed by that monarch. So many dangers encompassed him, that the Vatican was no secure abode, and he had taken refuge in Apulia, under the protection of the renowned Robert Guiscard. Thither Peter appears to have followed him, though in what spot their meeting took place is not stated with any precision by ancient chroniclers or modern historians. Urban received him most kindly; read, with tears in his eyes, the epistle from the

Patriarch Simeon, and listened to the eloquent story of the Hermit with an attention which shewed how deeply he sympathised with the woes of the Christian Church. Enthusiasm is contagious; and the Pope appears to have caught it instantly from one whose zeal was so unbounded. Giving the Hermit full powers, he sent him abroad to preach the holy war to all the nations and potentates of Christendom. The Hermit preached, and countless thousands answered to his call. France, Germany, and Italy started at his voice, and prepared for the deliverance of Zion. One of the early historians of the Crusade, who was himself an eye-witness of the rapture of Europe,¹ describes the personal appearance of the Hermit at this time. He says, that there appeared to be something of divine in every thing which he said or did. The people so highly revered him, that they plucked hairs from the mane of his mule that they might keep them as relics. While preaching, he wore in general a woollen tunic, with a dark-coloured mantle, which fell down to his heels. His arms and feet were bare; and he ate neither flesh nor bread, supporting himself chiefly upon fish and wine. "He set out," says the chronicler, "from whence I know not; but we saw him passing through the towns and villages, preaching every where, and the people surrounding him in crowds, loading him with offerings, and celebrating his sanctity with such great praises, that I never remember to have seen such honours bestowed upon any one." Thus he went on, untired, inflexible, and full of devotion, communicating his own madness to his hearers, until Europe was stirred from its very depths.

While the Hermit was appealing with such signal success to the people, the Pope appealed with as much success to those who were to become the chiefs and leaders of the expedition. His first step was to call a council at Placentia, in the autumn of the year 1095. Here, in the assembly of the clergy, the Pope debated the grand scheme, and gave audience to emissaries who had been sent from Constantinople by the Emperor of the East, to detail the progress made by the Turks in their design of establishing themselves in Europe. The clergy were of course unanimous in

support of the Crusade; and the council separated, each individual member of it being empowered to preach it to his people.

But Italy could not be expected to furnish all the aid required; and the Pope crossed the Alps to inspire the fierce and powerful nobility and chivalrous population of Gaul. His boldness in entering the territory, and placing himself in the power of his foe, King Philip of France, is not the least surprising feature of his mission. Some have imagined that cool policy alone actuated him; while others assert that it was mere zeal, as warm and as blind as that of Peter the Hermit. The latter opinion seems to be the true one. Society did not calculate the consequences of what it was doing. Every man seemed to act from impulse only; and the Pope, in throwing himself into the heart of France, acted as much from impulse as the thousands who responded to his call. A council was eventually summoned to meet him at Clermont, in Auvergne, to consider the state of the Church, reform abuses, and, above all, make preparations for the war. It was in the midst of an extremely cold winter, and the ground was covered with snow. During seven days the council sat with closed doors, while immense crowds from all parts of France flocked into the town, in expectation that the Pope himself would address the people. All the towns and villages for miles around were filled with the multitude; even the fields were encumbered with people, who, unable to procure lodging, pitched their tents under the trees and by the way-side. All the neighbourhood presented the appearance of a vast camp.



THE CATHEDRAL OF CLERMONT.

During the seven days' deliberation, a sentence of excommunication was passed upon King Philip for adultery with Bertrade de Montfort, Countess of Anjou, and for disobedience to the supreme authority of the apostolic see. This bold step impressed the people with reverence for so stern a Church, which in the discharge of its duty shewed itself no respecter of persons. Their love and their fear were alike increased, and they were prepared to listen with more intense devotion to the preaching of so righteous and inflexible a pastor. The great square before the cathedral church of Clermont became every instant more densely crowded as the hour drew nigh when the Pope was to address the populace. Issuing from the church in his full canonicals, surrounded by his cardinals and bishops in all the splendour of Romish ecclesiastical costume, the Pope stood before the populace on a high scaffolding erected for the occasion, and covered with scarlet cloth. A brilliant array of bishops and cardinals surrounded him; and among them, humbler in rank, but more important in the world's eye, the Hermit Peter, dressed in his simple and austere habiliments. Historians differ as to whether or not Peter addressed the crowd, but as all agree that he was present, it seems reasonable to suppose

that he spoke. But it was the oration of the Pope that was most important. As he lifted up his hands to ensure attention, every voice immediately became still. He began by detailing the miseries endured by their brethren in the Holy Land; how the plains of Palestine were desolated by the outrageous heathen, who with the sword and the firebrand carried wailing into the dwellings and flames into the possessions of the faithful; how Christian wives and daughters were defiled by pagan lust; how the altars of the true God were desecrated, and the relics of the saints trodden under foot. "You," continued the eloquent pontiff (and Urban II. was one of the most eloquent men of the day), "you, who hear me, and who have received the true faith, and been endowed by God with power, and strength, and greatness of soul,—whose ancestors have been the prop of Christendom, and whose kings have put a barrier against the progress of the infidel,—I call upon you to wipe off these impurities from the face of the earth, and lift your oppressed fellow-Christians from the depths into which they have been trampled. The sepulchre of Christ is possessed by the heathen, the sacred places dishonoured by their vileness. Oh, brave knights and faithful people! offspring of invincible fathers! ye will not degenerate from your ancient renown. Ye will not be restrained from embarking in this great cause by the tender ties of wife or little ones, but will remember the words of the Saviour of the world himself, 'Whosoever loves father and mother more than me is not worthy of me. Whosoever shall abandon for my name's sake his house, or his brethren, or his sisters, or his father, or his mother, or his wife, or his children, or his lands, shall receive a hundredfold, and shall inherit eternal life.'"

The warmth of the Pontiff communicated itself to the crowd, and the enthusiasm of the people broke out several times ere he concluded his address. He went on to portray, not only the spiritual but the temporal advantages that would accrue to those who took up arms in the service of the cross. Palestine was, he said, a land flowing with milk and honey, and precious in the sight of God, as the scene of the grand events which had

saved mankind. That land, he promised, should be divided among them. Moreover, they should have full pardon for all their offences, either against God or man. "Go, then," he added, "in expiation of your sins; and go assured, that after this world shall have passed away, imperishable glory shall be yours in the world which is to come." The enthusiasm was no longer to be restrained, and loud shouts interrupted the speaker; the people exclaiming as if with one voice, "*Dieu le veult! Dieu le veult!*" With great presence of mind Urban took advantage of the outburst, and as soon as silence was obtained, continued: "Dear brethren, to-day is shewn forth in you that which the Lord has said by his Evangelist, 'When two or three are gathered together in my name, there will I be in the midst of them to bless them.' If the Lord God had not been in your souls, you would not all have pronounced the same words; or rather God himself pronounced them by your lips, for it was he that put them in your hearts. Be they, then, your war-cry in the combat, for those words came forth from God. Let the army of the Lord, when it rushes upon his enemies, shout but that one cry, '*Dieu le veult! Dieu le veult!*' Let whoever is inclined to devote himself to this holy cause make it a solemn engagement, and bear the cross of the Lord either on his breast or his brow till he set out; and let him who is ready to begin his march place the holy emblem on his shoulders, in memory of that precept of our Saviour, 'He who does not take up his cross and follow me is not worthy of me.'"

The news of this council spread to the remotest parts of Europe in an incredibly short space of time. Long before the fleetest horseman could have brought the intelligence, it was known by the people in distant provinces; a fact which was considered as nothing less than supernatural. But the subject was in every body's mouth, and the minds of men were prepared for the result. The enthusiastic merely asserted what they wished, and the event tallied with their prediction. This was, however, quite enough in those days for a miracle, and as a miracle every one regarded it.

For several months after the Council of Clermont, France and Germany presented a singular spectacle. The pious, the fanatic, the needy, the dissolute, the young and the old, even women and children, and the halt and lame, enrolled themselves by hundreds. In every village the clergy were busied in keeping up the excitement, promising eternal rewards to those who assumed the red cross, and fulminating the most awful denunciations against all the worldly-minded who refused or even hesitated. Every debtor who joined the Crusade was freed by the papal edict from the claims of his creditors; outlaws of every grade were made equal with the honest upon the same conditions. The property of those who went was placed under the protection of the Church, and St. Paul and St. Peter themselves were believed to descend from their high abode, to watch over the chattels of the absent pilgrims. Signs and portents were seen in the air, to increase the fervour of the multitude. An aurora-borealis of unusual brilliancy appeared, and thousands of the Crusaders came out to gaze upon it, prostrating themselves upon the earth in adoration. It was thought to be a sure prognostic of the interposition of the Most High; and a representation of his armies fighting with and overthrowing the infidels. Reports of wonders were every where rife. A monk had seen two gigantic warriors on horseback, the one representing a Christian and the other a Turk, fighting in the sky with flaming swords, the Christian of course overcoming the Paynim. Myriads of stars were said to have fallen from heaven, each representing the fall of a Pagan foe. It was believed at the same time that the Emperor Charlemagne would rise from the grave, and lead on to victory the embattled armies of the Lord. A singular feature of the popular madness was the enthusiasm of the women. Every where they encouraged their lovers and husbands to forsake all things for the holy war. Many of them burned the sign of the cross upon their breasts and arms, and coloured the wound with a red dye, as a lasting memorial of their zeal. Others, still more zealous, impressed the mark by the same means upon the tender limbs of young children and infants at the breast.

Guibert de Nogent tells of a monk who made a large incision upon his forehead in the form of a cross, which he coloured with some powerful ingredient, telling the people that an angel had done it when he was asleep. This monk appears to have been more of a rogue than a fool, for he contrived to fare more sumptuously than any of his brother pilgrims, upon the strength of his sanctity. The Crusaders every where gave him presents of food and money, and he became quite fat ere he arrived at Jerusalem, notwithstanding the fatigues of the way. If he had acknowledged in the first place that he had made the wound himself, he would not have been thought more holy than his fellows; but the story of the angel was a clincher.

All those who had property of any description rushed to the mart to change it into hard cash. Lands and houses could be had for a quarter of their value, while arms and accoutrements of war rose in the same proportion. Corn, which had been excessively dear in anticipation of a year of scarcity, suddenly became plentiful; and such was the diminution in the value of provisions, that seven sheep were sold for five *deniers*.² The nobles mortgaged their estates for mere trifles to Jews and unbelievers, or conferred charters of immunity upon the towns and communes within their fiefs, for sums which, a few years previously, they would have rejected with disdain. The farmer endeavoured to sell his plough, and the artisan his tools, to purchase a sword for the deliverance of Jerusalem. Women disposed of their trinkets for the same purpose. During the spring and summer of this year (1096) the roads teemed with crusaders, all hastening to the towns and villages appointed as the rendezvous of the district. Some were on horseback, some in carts, and some came down the rivers in boats and rafts, bringing their wives and children, all eager to go to Jerusalem. Very few knew where Jerusalem was. Some thought it fifty thousand miles away, and others imagined that it was but a month's journey; while at sight of every town or castle the children exclaimed, "Is that Jerusalem? Is that the city?"³ Parties of knights and nobles might be seen travelling eastward,

and amusing themselves as they went with the knightly diversion of hawking, to lighten the fatigues of the way.

Guibert de Nogent, who did not write from hearsay, but from actual observation, says the enthusiasm was so contagious, that when any one heard the orders of the Pontiff, he went instantly to solicit his neighbours and friends to join with him in “the way of God,” for so they called the proposed expedition. The Counts Palatine were full of the desire to undertake the journey, and all the inferior knights were animated with the same zeal. Even the poor caught the flame so ardently, that no one paused to think of the inadequacy of his means, or to consider whether he ought to yield up his farm, his vineyard, or his fields. Each one set about selling his property at as low a price as if he had been held in some horrible captivity, and sought to pay his ransom without loss of time. Those who had not determined upon the journey joked and laughed at those who were thus disposing of their goods at such ruinous prices, prophesying that the expedition would be miserable and their return worse. But they held this language only for a day; the next they were suddenly seized with the same frenzy as the rest. Those who had been loudest in their jeers gave up all their property for a few crowns, and set out with those they had so laughed at a few hours before. In most cases the laugh was turned against them; for when it became known that a man was hesitating, his more zealous neighbours sent him a present of a knitting-needle or a distaff, to shew their contempt of him. There was no resisting this; so that the fear of ridicule contributed its fair contingent to the armies of the Lord.

Another effect of the Crusade was, the religious obedience with which it inspired the people and the nobility for that singular institution “The Truce of God.” At the commencement of the eleventh century, the clergy of France, sympathising for the woes of the people, but unable to diminish them, by repressing the rapacity and insolence of the feudal chiefs, endeavoured to promote universal good-will by the promulgation of the famous “Peace of God.” All who conformed to it bound themselves by oath

not to take revenge for any injury, not to enjoy the fruits of property usurped from others, nor to use deadly weapons; in reward of which they would receive remission of all their sins. However benevolent the intention of this "Peace," it led to nothing but perjury, and violence reigned as uncontrolled as before. In the year 1041, another attempt was made to soften the angry passions of the semi-barbarous chiefs, and the "Truce of God" was solemnly proclaimed. The *truce* lasted from the Wednesday evening to the Monday morning of every week, in which interval it was strictly forbidden to recur to violence on any pretext, or to seek revenge for any injury. It was impossible to civilise men by these means. Few even promised to become peaceable for so unconscionable a period as five days a-week; or if they did, they made ample amends on the two days left open to them. The truce was afterwards shortened from the Saturday evening to the Monday morning; but little or no diminution of violence and bloodshed was the consequence. At the Council of Clermont, Urban II. again solemnly proclaimed the truce. So strong was the religious feeling, that every one hastened to obey. All minor passions disappeared before the grand passion of crusading. The feudal chief ceased to oppress, the robber to plunder, the people to complain; but one idea was in all hearts, and there seemed to be no room for any other.

The encampments of these heterogeneous multitudes offered a singular aspect. Those vassals who ranged themselves under the banners of their lord erected tents around his castle; while those who undertook the war on their own account constructed booths and huts in the neighbourhood of the towns or villages, preparatory to their joining some popular leader of the expedition. The meadows of France were covered with tents. As the belligerents were to have remission of all their sins on their arrival in Palestine, hundreds of them gave themselves up to the most unbounded licentiousness. The courtesan, with the red cross upon her shoulders, plied her shameless trade with sensual pilgrims without scruple on either side; the lover of good cheer gave loose rein to his appetite, and drunkenness

and debauchery flourished. Their zeal in the service of the Lord was to wipe out all faults and follies, and they had the same surety of salvation as the rigid anchorite. This reasoning had charms for the ignorant, and the sounds of lewd revelry and the voice of prayer rose at the same instant from the camp.

It is now time to speak of the leaders of the expedition. Great multitudes ranged themselves under the command of Peter the Hermit, whom, as the originator, they considered the most appropriate leader of the war. Others joined the banner of a bold adventurer, whom history has dignified with no other name than that of Gautier sans Avoir, or Walter the Pennyless, but who is represented as having been of noble family, and well skilled in the art of war. A third multitude from Germany flocked around the standard of a monk named Gottschalk, of whom nothing is known except that he was a fanatic of the deepest dye. All these bands, which together are said to have amounted to three hundred thousand men, women, and children, were composed of the vilest rascality of Europe. Without discipline, principle, or true courage, they rushed through the nations like a pestilence, spreading terror and death wherever they went. The first multitude that set forth was led by Walter the Pennyless early in the spring of 1096, within a very few months after the Council of Clermont. Each man of that irregular host aspired to be his own master. Like their nominal leader, each was poor to penury, and trusted for subsistence on his journey to the chances of the road. Rolling through Germany like a tide, they entered Hungary, where, at first, they were received with some degree of kindness by the people. The latter had not yet caught sufficient of the fire of enthusiasm to join the Crusade themselves, but were willing enough to forward the cause by aiding those embarked in it. Unfortunately this good understanding did not last long. The swarm were not contented with food for their necessities, but craved for luxuries also. They attacked and plundered the dwellings of the country people, and thought nothing of murder where resistance was offered. On their arrival before Semlin, the outraged Hungarians collected

in large numbers, and, attacking the rear of the crusading host, slew a great many of the stragglers, and, taking away their arms and crosses, affixed them as trophies to the walls of the city. Walter appears to have been in no mood or condition to make reprisals; for his army, destructive as a plague of locusts when plunder urged them on, were useless against any regular attack from a determined enemy. Their rear continued to be thus harassed by the wrathful Hungarians until they were fairly out of their territory. On his entrance into Bulgaria, Walter met with no better fate. The cities and towns refused to let him pass; the villages denied him provisions; and the citizens and country people uniting, slaughtered his followers by hundreds. The progress of the army was more like a retreat than an advance; but as it was impossible to stand still, Walter continued his course till he arrived at Constantinople with a force which famine and the sword had diminished to one-third of its original number.

The greater multitude, led by the enthusiastic Hermit, followed close upon his heels, with a bulky train of baggage, and women and children sufficient to form a host of themselves. If it were possible to find a rabble more vile than the army of Walter the Pennyless, it was that led by Peter the Hermit. Being better provided with means, they were not reduced to the necessity of pillage in their progress through Hungary; and had they taken any other route than that which led through Semlin, might perhaps have traversed the country without molestation. On their arrival before that city, their fury was raised at seeing the arms and red crosses of their predecessors hanging as trophies over the gates. Their pent-up ferocity exploded at the sight. The city was tumultuously attacked, and the besiegers entering, not by dint of bravery, but of superior numbers, it was given up to all the horrors which follow when victory, brutality, and licentiousness are linked together. Every evil passion was allowed to revel with impunity, and revenge, lust, and avarice,—each had its hundreds of victims in unhappy Semlin. Any maniac can kindle a conflagration, but it may require many wise men to put it out. Peter the Hermit had blown the

popular fury into a flame, but to cool it again was beyond his power. His followers rioted unrestrained, until the fear of retaliation warned them to desist. When the king of Hungary was informed of the disasters of Semlin, he marched with a sufficient force to chastise the Hermit, who, at the news, broke up his camp and retreated towards the Morava, a broad and rapid stream that joins the Danube a few miles to the eastward of Belgrade. Here a party of indignant Bulgarians awaited him, and so harassed him, as to make the passage of the river a task both of difficulty and danger. Great numbers of his infatuated followers perished in the waters, and many fell under the swords of the Bulgarians. The ancient chronicles do not mention the amount of the Hermit's loss at this passage, but represent it in general terms as very great.

At Nissa, the Duke of Bulgaria fortified himself, in fear of an assault; but Peter, having learned a little wisdom from experience, thought it best to avoid hostilities. He passed three nights in quietness under the walls, and the duke, not wishing to exasperate unnecessarily so fierce and rapacious a host, allowed the townspeople to supply them with provisions. Peter took his departure peaceably on the following morning; but some German vagabonds, falling behind the main body of the army, set fire to the mills and house of a Bulgarian, with whom, it appears, they had had some dispute on the previous evening. The citizens of Nissa, who had throughout mistrusted the Crusaders, and were prepared for the worst, sallied out immediately, and took signal vengeance. The spoilers were cut to pieces, and the townspeople pursuing the Hermit, captured all the women and children who had lagged in the rear, and a great quantity of baggage. Peter hereupon turned round and marched back to Nissa, to demand explanation of the Duke of Bulgaria. The latter fairly stated the provocation given, and the Hermit could urge nothing in palliation of so gross an outrage. A negotiation was entered into, which promised to be successful, and the Bulgarians were about to deliver up the women and children, when a party of undisciplined Crusaders, acting solely upon their own suggestion,

endeavoured to scale the walls and seize upon the town. Peter in vain exerted his authority; the confusion became general, and after a short but desperate battle, the Crusaders threw down their arms, and fled in all directions. Their vast host was completely routed, the slaughter being so great among them, as to be counted, not by hundreds, but by thousands.

It is said that the Hermit fled from this fatal field to a forest a few miles from Nissa, abandoned by every human creature. It would be curious to know whether, after so dire a reverse,

“His enpierced breast
Sharp sorrow did in thousand pieces rive,”

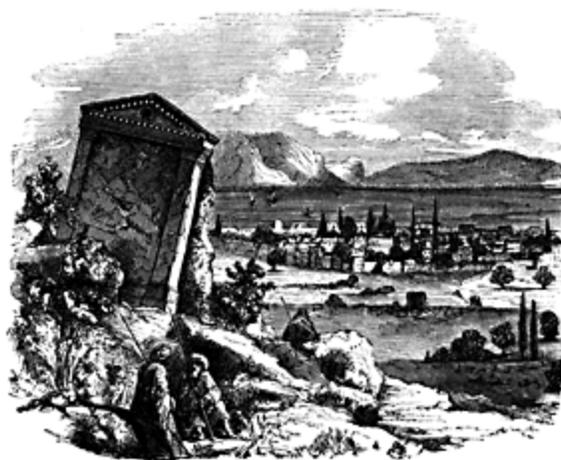
or whether his fiery zeal still rose superior to calamity, and pictured the eventual triumph of his cause. He, so lately the leader of a hundred thousand men, was now a solitary skulker in the forests, liable at every instant to be discovered by some pursuing Bulgarian, and cut off in mid career. Chance at last brought him within sight of an eminence, where two or three of his bravest knights had collected five hundred of the stragglers. These gladly received the Hermit, and a consultation having taken place, it was resolved to gather together the scattered remnants of the army. Fires were lighted on the hill, and scouts sent out in all directions for the fugitives. Horns were sounded at intervals, to make known that friends were near, and before nightfall the Hermit saw himself at the head of seven thousand men. During the succeeding day, he was joined by twenty thousand more, and with this miserable remnant of his force, he pursued his route towards Constantinople. The bones of the rest mouldered in the forests of Bulgaria.

On his arrival at Constantinople, where he found Walter the Pennyless awaiting him, he was hospitably received by the Emperor Alexius. It might have been expected that the sad reverses they had undergone would have

taught his followers common prudence; but, unhappily for them, their turbulence and love of plunder was not to be restrained. Although they were surrounded by friends, by whom all their wants were liberally supplied, they could not refrain from rapine. In vain the Hermit exhorted them to tranquillity; he possessed no more power over them, in subduing their passions, than the obscurest soldier of the host. They set fire to several public buildings in Constantinople out of pure mischief, and stripped the lead from the roofs of the churches, which they afterwards sold for old metal in the purlieu of the city. From this time may be dated the aversion which the Emperor Alexius entertained for the Crusaders, and which was afterwards manifested in all his actions, even when he had to deal with the chivalrous and more honourable armies which arrived after the Hermit. He seems to have imagined that the Turks themselves were enemies less formidable to his power than these outpourings of the refuse of Europe: he soon found a pretext to hurry them into Asia Minor. Peter crossed the Bosphorus with Walter, but the excesses of his followers were such, that, despairing of accomplishing any good end by remaining at their head, he left them to themselves, and returned to Constantinople, on the pretext of making arrangements with the government of Alexius for a proper supply of provisions. The Crusaders, forgetting that they were in the enemy's country, and that union, above all things, was desirable, gave themselves up to dissensions. Violent disputes arose between the Lombards and Normans commanded by Walter the Pennyless, and the Franks and Germans led out by Peter. The latter separated themselves from the former, and, choosing for their leader one Reinaldo, or Reinhold, marched forward, and took possession of the fortress of Exorogorgon. The Sultan Solimaun was on the alert, with a superior force. A party of Crusaders, which had been detached from the fort, and stationed at a little distance as an ambuscade, were surprised and cut to pieces, and Exorogorgon invested on all sides. The siege was protracted for eight days, during which the Christians suffered the most acute agony from the want

of water. It is hard to say how long the hope of succour or the energy of despair would have enabled them to hold out: their treacherous leader cut the matter short by renouncing the Christian faith, and delivering up the fort into the hands of the sultan. He was followed by two or three of his officers; all the rest, refusing to become Mahometans, were ruthlessly put to the sword. Thus perished the last wretched remnant of the vast multitude which had traversed Europe with Peter the Hermit.

Walter the Pennyless and his multitude met as miserable a fate. On the news of the disasters of Exorogorgon, they demanded to be led instantly against the Turks. Walter, who only wanted good soldiers to have made a good general, was cooler of head, and saw all the dangers of such a step. His force was wholly insufficient to make any decisive movement in a country where the enemy was so much superior, and where, in case of defeat, he had no secure position to fall back upon; and he therefore expressed his opinion against advancing until the arrival of reinforcements. This prudent counsel found no favour: the army loudly expressed their dissatisfaction at their chief, and prepared to march forward without him. Upon this, the brave Walter put himself at their head, and rushed to destruction. Proceeding towards Nice, the modern Isnik, he was intercepted by the army of the sultan: a fierce battle ensued, in which the Turks made fearful havoc; out of twenty-five thousand Christians, twenty-two thousand were slain, and among them Gautier himself, who fell pierced by seven mortal wounds. The remaining three thousand retreated upon Civitot, where they entrenched themselves.



ISNIK.

Disgusted as was Peter the Hermit at the excesses of the multitude, who, at his call, had forsaken Europe, his heart was moved with grief and pity at their misfortunes. All his former zeal revived: casting himself at the feet of the Emperor Alexius, he implored him, with tears in his eyes, to send relief to the few survivors at Civitot. The emperor consented, and a force was sent, which arrived just in time to save them from destruction. The Turks had beleaguered the place, and the Crusaders were reduced to the last extremity. Negotiations were entered into, and the last three thousand were conducted in safety to Constantinople. Alexius had suffered too much by their former excesses to be very desirous of retaining them in his capital:

he therefore caused them all to be disarmed, and, furnishing each with a sum of money, he sent them back to their own country.

While these events were taking place, fresh hordes were issuing from the woods and wilds of Germany, all bent for the Holy Land. They were commanded by a fanatical priest, named Gottschalk, who, like Gautier and Peter the Hermit, took his way through Hungary. History is extremely meagre in her details of the conduct and fate of this host, which amounted to at least one hundred thousand men. Robbery and murder seem to have journeyed with them, and the poor Hungarians were rendered almost desperate by their numbers and rapacity. Karloman, the king of the country, made a bold effort to get rid of them; for the resentment of his people had arrived at such a height, that nothing short of the total extermination of the Crusaders would satisfy them. Gottschalk had to pay the penalty, not only for the ravages of his own bands, but for those of the swarms that had come before him. He and his army were induced, by some means or other, to lay down their arms: the savage Hungarians, seeing them thus defenceless, set upon them, and slaughtered them in great numbers. How many escaped their arrows we are not informed; but not one of them reached Palestine.

Other swarms, under nameless leaders, issued from Germany and France, more brutal and more frantic than any that had preceded them. Their fanaticism surpassed by far the wildest freaks of the followers of the Hermit. In bands, varying in numbers from one to five thousand, they traversed the country in all directions, bent upon plunder and massacre. They wore the symbol of the Crusade upon their shoulders, but inveighed against the folly of proceeding to the Holy Land to destroy the Turks, while they left behind them so many

Jews, the still more inveterate enemies of Christ. They swore fierce vengeance against this unhappy race, and murdered all the Hebrews they could lay their hands on, first subjecting them to the most horrible mutilation. According to the testimony of Albert Aquensis, they lived among each other in the most shameless profligacy, and their vice was only exceeded by their superstition. Whenever they were in search of Jews, they were preceded by a goose and goat, which they believed to be holy, and animated with divine power to discover the retreats of the unbelievers. In Germany alone they slaughtered more than a thousand Jews, notwithstanding all the efforts of the clergy to save them. So dreadful was the cruelty of their tormentors, that great numbers of Jews committed self-destruction to avoid falling into their hands.

Again it fell to the lot of the Hungarians to deliver Europe from these pests. When there were no more Jews to murder, the bands collected in one body, and took the old route to the Holy Land, a route stained with the blood of three hundred thousand who had gone before, and destined also to receive theirs. The number of these swarms has never been stated; but so many of them perished in Hungary, that contemporary writers, despairing of giving any adequate idea of their multitudes, state that the fields were actually heaped with their corpses, and that for miles in its course the waters of the Danube were dyed with their blood. It was at Mersburg, on the Danube, that the greatest slaughter took place,—a slaughter so great as to amount almost to extermination. The Hungarians for a while disputed the passage of the river, but the Crusaders forced their way across, and attacking the city with the blind courage of madness, succeeded in making a breach in the walls. At this moment of victory

an unaccountable fear came over them. Throwing down their arms, they fled panic-stricken, no one knew why, and no one knew whither. The Hungarians followed, sword in hand, and cut them down without remorse, and in such numbers, that the stream of the Danube is said to have been choked up by their unburied bodies.

This was the worst paroxysm of the madness of Europe; and this passed, her chivalry stepped upon the scene. Men of cool heads, mature plans, and invincible courage stood forward to lead and direct the grand movement of Europe upon Asia. It is upon these men that romance has lavished her most admiring epithets, leaving to the condemnation of history the vileness and brutality of those who went before. Of these leaders the most distinguished were Godfrey of Bouillon duke of Lorraine, and Raymond count of Toulouse. Four other chiefs of the royal blood of Europe also assumed the cross, and led each his army to the Holy Land; Hugh count of Vermandois, brother of the king of France; Robert duke of Normandy, the elder brother of William Rufus; Robert count of Flanders, and Bohemund prince of Tarentum, eldest son of the celebrated Robert Guiscard. These men were all tinged with the fanaticism of the age, but none of them acted entirely from religious motives. They were neither utterly reckless like Gautier sans Avoir, crazy like Peter the Hermit, nor brutal like Gottschalk the Monk, but possessed each of these qualities in a milder form; their valour being tempered by caution, their religious zeal by worldly views, and their ferocity by the spirit of chivalry. They saw whither led the torrent of the public will; and it being neither their wish nor their interest to stem it, they allowed themselves to be carried with it, in the hope that it would lead them at last to a haven of aggrandisement. Around

them congregated many minor chiefs, the flower of the nobility of France and Italy, with some few from Germany, England, and Spain. It was wisely conjectured that armies so numerous would find a difficulty in procuring provisions if they all journeyed by the same road. They therefore resolved to separate; Godfrey de Bouillon proceeding through Hungary and Bulgaria, the Count of Toulouse through Lombardy and Dalmatia, and the other leaders through Apulia to Constantinople, where the several divisions were to reunite. The forces under these leaders have been variously estimated. The Princess Anna Comnena talks of them as having been as numerous as the sands on the sea-shore, or the stars in the firmament. Fulcher of Chartres is more satisfactory, and exaggerates less magnificently, when he states, that all the divisions, when they had sat down before Nice in Bithynia, amounted to one hundred thousand horsemen, and six hundred thousand men on foot, exclusive of the priests, women, and children. Gibbon is of opinion that this amount is exaggerated; but thinks the actual numbers did not fall very far short of the calculation. The Princess Anna afterwards gives the number of those under Godfrey of Bouillon as eighty thousand foot and horse; and supposing that each of the other chiefs led an army as numerous, the total would be near half a million. This must be over rather than under the mark, as the army of Godfrey of Bouillon was confessedly the largest when it set out, and suffered less by the way than any other.



GODFREY DE BOUILLON.

The Count of Vermandois was the first who set foot on the Grecian territory. On his arrival at Durazzo he was received with every mark of respect and courtesy by the agents of the emperor, and his followers were abundantly supplied with provisions. Suddenly, however, and without cause assigned, the count was arrested by order of the Emperor Alexius, and conveyed a close prisoner to Constantinople. Various motives have been assigned by different authors as having induced the emperor to this treacherous and imprudent proceeding. By every writer he has been condemned for so flagrant a breach of hospitality and justice. The most probable reason for his conduct appears to be that suggested by Guibert of Nogent, who states that Alexius, fearful of the designs of the Crusaders upon his throne, resorted to this extremity in order afterwards to force the count to take the oath of allegiance to him, as the price of his liberation. The example of a prince so eminent as the brother of the king of France, would, he thought, be readily followed by the other chiefs of the Crusade. In the result he was wofully

disappointed, as every man deserves to be who commits positive evil that doubtful good may ensue. But this line of policy accorded well enough with the narrowmindedness of the emperor, who, in the enervating atmosphere of his highly civilised and luxurious court, dreaded the influx of the hardy and ambitious warriors of the West, and strove to nibble away by unworthy means the power which he had not energy enough to confront. If danger to himself had existed from the residence of the chiefs in his dominions, he might easily have averted it, by the simple means of placing himself at the head of the European movement, and directing its energies to their avowed object, the conquest of the Holy Land. But the emperor, instead of being, as he might have been, the lord and leader of the Crusades, which he had himself aided in no inconsiderable degree to suscite by his embassies to the Pope, became the slave of men who hated and despised him. No doubt the barbarous excesses of the followers of Gautier and Peter the Hermit made him look upon the whole body of them with disgust, but it was the disgust of a little mind, which is glad of any excuse to palliate or justify its own irresolution and love of ease.

Godfrey of Bouillon traversed Hungary in the most quiet and orderly manner. On his arrival at Mersburg he found the country strewn with the mangled corpses of the Jew-killers, and demanded of the king of Hungary for what reason his people had set upon them. The latter detailed the atrocities they had committed, and made it so evident to Godfrey that the Hungarians had only acted in self-defence, that the high-minded leader declared himself satisfied, and passed on without giving or receiving molestation. On his arrival at Philippopoli he was informed for the first time of the imprisonment

of the count of Vermandois. He immediately sent messengers to the emperor, demanding the count's release, and threatening, in case of refusal, to lay waste the country with fire and sword. After waiting a day at Philippopoli, he marched on to Adrianople, where he was met by his messengers returning with the emperor's refusal. Godfrey, the bravest and most determined of the leaders of the Crusade, was not a man to swerve from his word, and the country was given up to pillage. Alexius here committed another blunder. No sooner did he learn from dire experience that the Crusader was not an utterer of idle threats, than he consented to the release of the prisoner. As he had been unjust in the first instance, he became cowardly in the second, and taught his enemies (for so the Crusaders were forced to consider themselves) a lesson which they took care to remember to his cost, that they could hope nothing from his sense of justice, but every thing from his fears. Godfrey remained encamped for several weeks in the neighbourhood of Constantinople, to the great annoyance of Alexius, who sought by every means to extort from him the homage he had extorted from Vermandois. Sometimes he acted as if at open and declared war with the Crusaders, and sent his troops against them. Sometimes he refused to supply them with food, and ordered the markets to be shut against them, while at other times he was all for peace and good-will, and sent costly presents to Godfrey. The honest, straightforward Crusader was at last so wearied by his false kindness, and so pestered by his attacks, that, allowing his indignation to get the better of his judgment, he gave up the country around Constantinople to be plundered by his soldiers. For six days the flames of the farm-houses around struck terror into the heart of Alexius; but, as Godfrey anticipated, they convinced him of

his error. Fearing that Constantinople itself would be the next object of attack, he sent messengers to demand an interview with Godfrey, offering at the same time to leave his son as a hostage for his good faith. Godfrey agreed to meet him; and, whether to put an end to these useless dissensions, or for some other unexplained reason, he rendered homage to Alexius as his liege lord. He was thereupon loaded with honours, and, according to a singular custom of that age, underwent the ceremony of the “adoption of honour” as son to the emperor. Godfrey and his brother Baudouin de Bouillon conducted themselves with proper courtesy on this occasion, but were not able to restrain the insolence of their followers, who did not conceive themselves bound to keep any terms with a man so insincere as he had shewn himself. One barbarous chieftain, Count Robert of Paris, carried his insolence so far as to seat himself upon the throne; an insult which Alexius merely resented with a sneer, but which did not induce him to look with less mistrust upon the hordes that were still advancing.

It is impossible, notwithstanding his treachery, to avoid feeling some compassion for the emperor, whose life at this time was rendered one long scene of misery by the presumption of the Crusaders, and his not altogether groundless fears of the evil they might inflict upon him, should any untoward circumstance force the current of their ambition to the conquest of his empire. His daughter Anna Comnena feelingly deplores his state of life at this time, and a learned German⁴, in a recent work, describes it, on the authority of the princess, in the following manner:

“To avoid all occasion of offence to the Crusaders, Alexius complied with all their whims and their (on many occasions)

unreasonable demands, even at the expense of great bodily exertion, at a time when he was suffering severely under the gout, which eventually brought him to his grave. No Crusader who desired an interview with him was refused access; he listened with the utmost patience to the long-winded harangues which their loquacity or zeal continually wearied him with; he endured, without expressing any impatience, the unbecoming and haughty language which they permitted themselves to employ towards him, and severely reprimanded his officers when they undertook to defend the dignity of the imperial station from these rude assaults, for he trembled with apprehension at the slightest disputes, lest they might become the occasion of greater evil. Though the counts often appeared before him with trains altogether unsuitable to their dignity and to his—sometimes with an entire troop, which completely filled the royal apartment—the emperor held his peace. He listened to them at all hours; he often seated himself on his throne at day-break to attend to their wishes and requests, and the evening twilight saw him still in the same place. Very frequently he could not snatch time to refresh himself with meat and drink. During many nights he could not obtain any repose, and was obliged to indulge in an unrefreshing sleep upon his throne, with his head resting on his hands. Even this slumber was continually disturbed by the appearance and harangues of some newly-arrived rude knights. When all the courtiers, wearied out by the efforts of the day and by night-watching, could no longer keep themselves on their feet, and sank down exhausted—some upon benches and others on the floor—Alexius still rallied his strength

to listen with seeming attention to the wearisome chatter of the Latins, that they might have no occasion or pretext for discontent. In such a state of fear and anxiety, how could Alexius comport himself with dignity and like an emperor?”

Alexius, however, had himself to blame, in a great measure, for the indignities he suffered: owing to his insincerity, the Crusaders mistrusted him so much, that it became at last a common saying, that the Turks and Saracens were not such inveterate foes to the Western or Latin Christians as the Emperor Alexius and the Greeks⁵. It would be needless in this sketch, which does not profess to be so much a history of the Crusades, as of the madness of Europe, from which they sprang, to detail the various acts of bribery and intimidation, cajolery and hostility, by which Alexius contrived to make each of the leaders in succession, as they arrived, take the oath of allegiance to him as their suzerain. One way or another he exacted from each the barren homage on which he had set his heart, and they were then allowed to proceed into Asia Minor. One only, Raymond de St. Gilles count of Toulouse, obstinately refused the homage.

Their residence in Constantinople was productive of no good to the armies of the cross. Bickerings and contentions on the one hand, and the influence of a depraved and luxurious court on the other, destroyed the elasticity of their spirits, and cooled the first ardour of their enthusiasm. At one time the army of the Count of Toulouse was on the point of disbanding itself; and, had not their leader energetically removed them across the Bosphorus, this would have been the result. Once in Asia, their spirits in some degree revived, and the presence of danger and difficulty nerved them to the work

they had undertaken. The first operation of the war was the siege of Nice, to gain possession of which all their efforts were directed.

Godfrey of Bouillon and the Count of Vermandois were joined under its walls by each host in succession as it left Constantinople. Among the celebrated Crusaders who fought at this siege we find, besides the leaders already mentioned, the brave and generous Tancred, whose name and fame have been immortalised in the *Gerusalemme Liberata*, the valorous Bishop of Puy, Baldwin, afterwards king of Jerusalem, and Peter the Hermit, now an almost solitary soldier, shorn of all the power and influence he had formerly possessed. Kilij Aslaun the sultan of Roum and chief of the Seljukian Turks, whose deeds, surrounded by the false halo of romance, are familiar to the readers of Tasso, under the name of Soliman, marched to defend this city, but was defeated after several obstinate engagements, in which the Christians shewed a degree of heroism that quite astonished him. The Turkish chief had expected to find a wild undisciplined multitude, like that under Peter the Hermit, without leaders capable of enforcing obedience; instead of which, he found the most experienced leaders of the age at the head of armies that had just fanaticism enough to be ferocious, but not enough to render them ungovernable. In these engagements, many hundreds fell on both sides; and on both sides the most revolting barbarity was practised: the Crusaders cut off the heads of the fallen Mussulmans, and sent them in panniers to Constantinople, as trophies of their victory. After the temporary defeat of Kilij Aslaun, the siege of Nice was carried on with redoubled vigour. The Turks defended themselves with the greatest obstinacy, and discharged showers of poisoned arrows upon the Crusaders. When any unfortunate wretch

was killed under the walls, they let down iron hooks from above, and drew the body up, which, after stripping and mutilating, they threw back again at the besiegers. The latter were well supplied with provisions, and for six-and-thirty days the siege continued without any relaxation of the efforts on either side. Many tales are told of the almost superhuman heroism of the Christian leaders—how one man put a thousand to flight; and how the arrows of the faithful never missed their mark. One anecdote of Godfrey of Bouillon, related by Albert of Aix, is worth recording, not only as shewing the high opinion entertained of his valour, but as shewing the contagious credulity of the armies—a credulity which as often led them to the very verge of defeat, as it incited them to victory. One Turk, of gigantic stature, took his station day by day on the battlements of Nice, and, bearing an enormous bow, committed great havoc among the Christian host. Not a shaft he sped but bore death upon its point; and although the Crusaders aimed repeatedly at his breast, and he stood in the most exposed position, their arrows fell harmless at his feet. He seemed to be invulnerable to attack; and a report was soon spread abroad, that he was no other than the Arch Fiend himself, and that mortal hand could not prevail against him. Godfrey of Bouillon, who had no faith in the supernatural character of the Mussulman, determined, if possible, to put an end to the dismay which was rapidly paralysing the exertions of his best soldiers. Taking a huge cross-bow, he stood forward in front of the army, to try the steadiness of his hand against the much-dreaded archer: the shaft was aimed directly at his heart, and took fatal effect. The Moslem fell amid the groans of the besieged, and the shouts of *Deus adjuva! Deus adjuva!* the war-cry of the besiegers.

At last the Crusaders imagined that they had overcome all obstacles, and were preparing to take possession of the city, when, to their great astonishment, they saw the flag of the Emperor Alexius flying from the battlements. An emissary of the emperor, named Faticius or Tatin, had contrived to gain admission, with a body of Greek troops, at a point which the Crusaders had left unprotected, and had persuaded the Turks to surrender to him rather than to the crusading forces. The greatest indignation prevailed in the army when this stratagem was discovered, and the soldiers were, with the utmost difficulty, prevented from renewing the attack and besieging the Greek emissary.

The army, however, continued its march, and, by some means or other, was broken into two divisions; some historians say accidentally,⁶ while others affirm by mutual consent, and for the convenience of obtaining provisions on the way.⁷ The one division was composed of the forces under Bohemund, Tancred, and the Duke of Normandy; while the other, which took a route at some distance on the right, was commanded by Godfrey of Bouillon and the other chiefs. The Sultan of Roum, who, after his losses at Nice, had been silently making great efforts to crush the Crusaders at one blow, collected in a very short time all the multitudinous tribes that owed him allegiance, and with an army which, according to a moderate calculation, amounted to two hundred thousand men, chiefly cavalry, he fell upon the first division of the Christian host in the valley of Dorylæum. It was early in the morning of the 1st of July 1097, when the Crusaders saw the first companies of the Turkish horsemen pouring down upon them from the hills. Bohemund had hardly time to set himself in order, and transport his sick and

helpless to the rear, when the overwhelming force of the Orientals was upon him. The Christian army, composed principally of men on foot, gave way on all sides, and the hoofs of the Turkish steeds, and the poisoned arrows of their bowmen, mowed them down by hundreds. After having lost the flower of their chivalry, the Christians retreated upon their baggage, when a dreadful slaughter took place. Neither women nor children, nor the sick, were spared. Just as they were reduced to the last extremity, Godfrey of Bouillon and the Count of Toulouse made their appearance on the field, and turned the tide of battle. After an obstinate engagement the Turks fled, and their rich camp fell into the hands of the enemy. The loss of the Crusaders amounted to about four thousand men, with several chiefs of renown, among whom were Count Robert of Paris and William the brother of Tancred. The loss of the Turks, which did not exceed this number, taught them to pursue a different mode of warfare. The sultan was far from being defeated. With his still gigantic army, he laid waste all the country on either side of the Crusaders. The latter, who were unaware of the tactics of the enemy, found plenty of provisions in the Turkish camp; but so far from economising these resources, they gave themselves up for several days to the most unbounded extravagance. They soon paid dearly for their heedlessness. In the ravaged country of Phrygia, through which they advanced towards Antiochetta, they suffered dreadfully for want of food for themselves and pasture for their cattle. Above them was a scorching sun, almost sufficient of itself to dry up the freshness of the land, a task which the firebrands of the sultan had but too surely effected, and water was not to be had after the first day of their march. The pilgrims died at the rate of five hundred a day. The

horses of the knights perished on the road, and the baggage which they had aided to transport was either placed upon dogs, sheep, and swine, or abandoned altogether. In some of the calamities that afterwards befell them, the Christians gave themselves up to the most reckless profligacy; but upon this occasion, the dissensions which prosperity had engendered were all forgotten. Religion, often disregarded, arose in the stern presence of misfortune, and cheered them as they died by the promises of eternal felicity.

At length they reached Antiochetta, where they found water in abundance, and pastures for their expiring cattle. Plenty once more surrounded them, and here they pitched their tents. Untaught by the bitter experience of famine, they again gave themselves up to luxury and waste.

On the 18th of October they sat down before the strong city of Antioch, the siege of which, and the events to which it gave rise, are among the most extraordinary incidents of the Crusade. The city, which is situated on an eminence, and washed by the river Orontes, is naturally a very strong position, and the Turkish garrison were well supplied with provisions to endure a long siege. In this respect the Christians were also fortunate, but unluckily for themselves, unwise. Their force amounted to three hundred thousand fighting men; and we are informed by Raymond d'Argilles, that they had so much provision, that they threw away the greater part of every animal they killed, being so dainty, that they would only eat particular parts of the beast. So insane was their extravagance, that in less than ten days famine began to stare them in the face. After making a fruitless attempt to gain possession of the city by a *coup de main*, they, starving themselves, sat down to starve out the enemy.

But with want came a cooling of enthusiasm. The chiefs began to grow weary of the expedition. Baldwin had previously detached himself from the main body of the army, and, proceeding to Edessa, had intrigued himself into the supreme power in that little principality. The other leaders were animated with less zeal than heretofore. Stephen of Chartres and Hugh of Vermandois began to waver, unable to endure the privations which their own folly and profusion had brought upon them. Even Peter the Hermit became sick at heart ere all was over. When the famine had become so urgent that they were reduced to eat human flesh in the extremity of their hunger, Bohemund and Robert of Flanders set forth on an expedition to procure a supply. They were in a slight degree successful; but the relief they brought was not economised, and in two days they were as destitute as before. Faticius, the Greek commander and representative of Alexius, deserted with his division under pretence of seeking for food, and his example was followed by various bodies of Crusaders.

Misery was rife among those who remained, and they strove to alleviate it by a diligent attention to signs and omens. These, with extraordinary visions seen by the enthusiastic, alternately cheered and depressed them according as they foretold the triumph or pictured the reverses of the cross. At one time a violent hurricane arose, levelling great trees with the ground, and blowing down the tents of the Christian leaders. At another time an earthquake shook the camp, and was thought to prognosticate some great impending evil to the cause of Christendom. But a comet which appeared shortly afterwards raised them from the despondency into which they had fallen; their lively imaginations making it assume the form of a

flaming cross leading them on to victory. Famine was not the least of the evils they endured. Unwholesome food, and the impure air from the neighbouring marshes, engendered pestilential diseases, which carried them off more rapidly than the arrows of the enemy. A thousand of them died in a day, and it became at last a matter of extreme difficulty to afford them burial. To add to their misery, each man grew suspicious of his neighbour; for the camp was infested by Turkish spies, who conveyed daily to the besieged intelligence of the movements and distresses of the enemy. With a ferocity, engendered by despair, Bohemund caused two spies, whom he had detected, to be roasted alive in presence of the army, and within sight of the battlements of Antioch. But even this example failed to reduce their numbers, and the Turks continued to be as well informed as the Christians themselves of all that was passing in the camp.

The news of the arrival of a reinforcement of soldiers from Europe, with an abundant stock of provisions, came to cheer them when reduced to the last extremity. The welcome succour landed at St. Simeon, the port of Antioch, and about six miles from that city. Thitherwards the famishing Crusaders proceeded in tumultuous bands, followed by Bohemund and the Count of Toulouse, with strong detachments of their retainers and vassals, to escort the supplies in safety to the camp. The garrison of Antioch, forewarned of this arrival, was on the alert, and a corps of Turkish archers was despatched to lie in ambush among the mountains and intercept their return. Bohemund, laden with provisions, was encountered in the rocky passes by the Turkish host. Great numbers of his followers were slain, and he himself had just time to escape to the camp with the news of his defeat. Godfrey of Bouillon, the Duke of Normandy,

and the other leaders had heard the rumour of this battle, and were at that instant preparing for the rescue. The army was immediately in motion, animated both by zeal and by hunger, and marched so rapidly as to intercept the victorious Turks before they had time to reach Antioch with their spoil. A fierce battle ensued, which lasted from noon till the going down of the sun. The Christians gained and maintained the advantage, each man fighting as if upon himself alone had depended the fortune of the day. Hundreds of Turks perished in the Orontes, and more than two thousand were left dead upon the field of battle. All the provision was recaptured and brought in safety to the camp, whither the Crusaders returned singing *Alleluia!* or shouting *Deus adjuva! Deus adjuva!*

This relief lasted for some days, and, had it been duly economised, would have lasted much longer; but the chiefs had no authority, and were unable to exercise any control over its distribution. Famine again approached with rapid strides, and Stephen count of Blois, not liking the prospect, withdrew from the camp with four thousand of his retainers, and established himself at Alexandretta. The moral influence of this desertion was highly prejudicial upon those who remained; and Bohemund, the most impatient and ambitious of the chiefs, foresaw that, unless speedily checked, it would lead to the utter failure of the expedition. It was necessary to act decisively; the army murmured at the length of the siege, and the sultan was collecting his forces to crush them. Against the efforts of the Crusaders Antioch might have held out for months; but treason within effected that which courage without might have striven for in vain.

Baghasihan, the Turkish prince or emir of Antioch, had under his command an Armenian of the name of Phirouz, whom he had entrusted with the defence of a tower on that part of the city wall which overlooked the passes of the mountains. Bohemund, by means of a spy who had embraced the Christian religion, and to whom he had given his own name at baptism, kept up a daily communication with this captain, and made him the most magnificent promises of reward, if he would deliver up his post to the Crusaders. Whether the proposal was first made by Bohemund or by the Armenian is uncertain, but that a good understanding soon existed between them is undoubted; and a night was fixed for the execution of the project. Bohemund communicated the scheme to Godfrey and the Count of Toulouse, with the stipulation that, if the city were won, he, as the soul of the enterprise, should enjoy the dignity of Prince of Antioch. The other leaders hesitated: ambition and jealousy prompted them to refuse their aid in furthering the views of the intriguer. More mature consideration decided them to acquiesce, and seven hundred of the bravest knights were chosen for the expedition, the real object of which, for fear of spies, was kept a profound secret from the rest of the army. When all was ready, a report was promulgated that the seven hundred were intended to form an ambuscade for a division of the sultan's army, which was stated to be approaching.

Every thing favoured the treacherous project of the Armenian captain, who, on his solitary watch-tower, received due intimation of the approach of the Crusaders. The night was dark and stormy; not a star was visible above, and the wind howled so furiously as to overpower all other sounds: the rain fell in torrents, and the watchers on the towers adjoining to that of Phirouz could not hear

the tramp of the armed knights for the wind, nor see them for the obscurity of the night and the dismalness of the weather. When within shot of the walls, Bohemund sent forward an interpreter to confer with the Armenian. The latter urged them to make haste, and seize the favourable interval, as armed men, with lighted torches, patrolled the battlements every half hour, and at that instant they had just passed. The chiefs were instantly at the foot of the wall: Phirouz let down a rope; Bohemund attached it to the end of a ladder of hides, which was then raised by the Armenian, and held while the knights mounted. A momentary fear came over the spirits of the adventurers, and every one hesitated. At last Bohemund,⁸ encouraged by Phirouz from above, ascended a few steps on the ladder, and was followed by Godfrey, Count Robert of Flanders, and a number of other knights. As they advanced, others pressed forward, until their weight became too great for the ladder, which, breaking, precipitated about a dozen of them to the ground, where they fell one upon the other, making a great clatter with their heavy coats of mail. For a moment they thought that all was lost; but the wind made so loud a howling as it swept in fierce gusts through the mountain gorges—and the Orontes, swollen by the rain, rushed so noisily along—that the guards heard nothing. The ladder was easily repaired, and the knights ascended two at a time, and reached the platform in safety. When sixty of them had thus ascended, the torch of the coming patrol was seen to gleam at the angle of the wall. Hiding themselves behind a buttress, they awaited his coming in breathless silence. As soon as he arrived at arm's length, he was suddenly seized, and, before he could open his lips to raise an alarm, the silence of death closed them up for ever. They next descended

rapidly the spiral staircase of the tower, and opening the portal, admitted the whole of their companions. Raymond of Toulouse, who, cognisant of the whole plan, had been left behind with the main body of the army, heard at this instant the signal horn, which announced that an entry had been effected, and, leading on his legions, the town was attacked from within and without.

Imagination cannot conceive a scene more dreadful than that presented by the devoted city of Antioch on that night of horror. The Crusaders fought with a blind fury, which fanaticism and suffering alike incited. Men, women, and children were indiscriminately slaughtered, till the streets ran with blood. Darkness increased the destruction, for when morning dawned the Crusaders found themselves with their swords at the breasts of their fellow-soldiers, whom they had mistaken for foes. The Turkish commander fled, first to the citadel, and that becoming insecure, to the mountains, whither he was pursued and slain, and his grey head brought back to Antioch as a trophy. At daylight the massacre ceased, and the Crusaders gave themselves up to plunder. They found gold, and jewels, and silks, and velvets in abundance, but of provisions, which were of more importance to them, they found but little of any kind. Corn was excessively scarce, and they discovered to their sorrow that in this respect the besieged had been but little better off than the besiegers.



SIEGE OF ANTIOCH.

Before they had time to instal themselves in their new position, and take the necessary measures for procuring a supply, the city was invested by the Turks. The sultan of Persia had raised an immense army, which he entrusted to the command of Kerbogha, the emir of Mosul, with instructions to sweep the Christian locusts from the face of the land. The emir effected a junction with Kilij Aslaun, and the two armies surrounded the city. Discouragement took complete possession of the Christian host, and numbers of them contrived to elude the vigilance of the besiegers, and escape to Count Stephen of Blois at Alexandretta, to whom they related the most exaggerated tales of the misery they had endured, and the utter hopelessness of continuing the war. Stephen forthwith broke up his camp and retreated towards Constantinople. On his way he was met by the Emperor Alexius, at the head of a considerable force, hastening to take possession of the conquests made by the Christians in Asia. As

soon as he heard of their woful plight, he turned back, and proceeded with the Count of Blois to Constantinople, leaving the remnant of the Crusaders to shift for themselves.

The news of this defection increased the discouragement at Antioch. All the useless horses of the army had been slain and eaten, and dogs, cats, and rats were sold at enormous prices. Even vermin were becoming scarce. With increasing famine came a pestilence, so that in a short time but sixty thousand remained of the three hundred thousand that had originally invested Antioch. But this bitter extremity, while it annihilated the energy of the host, only served to knit the leaders more firmly together; and Bohemund, Godfrey, and Tancred swore never to desert the cause as long as life lasted. The former strove in vain to reanimate the courage of his followers. They were weary and sick at heart, and his menaces and promises were alike thrown away. Some of them had shut themselves up in the houses, and refused to come forth. Bohemund, to drive them to their duty, set fire to the whole quarter, and many of them perished in the flames, while the rest of the army looked on with the utmost indifference. Bohemund, animated himself by a worldly spirit, did not know the true character of the Crusaders, nor understand the religious madness which had brought them in such shoals from Europe. A priest, more clear-sighted, devised a scheme which restored all their confidence, and inspired them with a courage so wonderful as to make the poor sixty thousand emaciated, sick, and starving zealots put to flight the well-fed and six times as numerous legions of the Sultan of Persia.

This priest, a native of Provence, was named Peter Barthelemy, and whether he were a knave or an enthusiast, or both; a principal,

or a tool in the hands of others, will ever remain a matter of doubt. Certain it is, however, that he was the means of raising the siege of Antioch, and causing the eventual triumph of the armies of the cross. When the strength of the Crusaders was completely broken by their sufferings, and hope had fled from every bosom, Peter came to Count Raymond of Toulouse, and demanded an interview on matters of serious moment. He was immediately admitted. He said that, some weeks previously, at the time the Christians were besieging Antioch, he was reposing alone in his tent, when he was startled by the shock of the earthquake, which had so alarmed the whole host. Through violent terror of the shock he could only ejaculate, God help me! when turning round he saw two men standing before him, whom he at once recognised by the halo of glory around them as beings of another world. One of them appeared to be an aged man, with reddish hair sprinkled with grey, black eyes, and a long flowing grey beard. The other was younger, larger, and handsomer, and had something more divine in his aspect. The elderly man alone spoke, and informed him that he was the holy apostle St. Andrew, and desired him to seek out the Count Raymond, the Bishop of Puy, and Raymond of Altopulto, and ask them why the bishop did not exhort the people, and sign them with the cross which he bore. The apostle then took him, naked in his shirt as he was, and transported him through the air into the heart of the city of Antioch, where he led him into the church of St. Peter, at that time a Saracen mosque. The apostle made him stop by the pillar close to the steps by which they ascend on the south side to the altar, where hung two lamps, which gave out a light brighter than that of the noonday sun; the younger man, whom he did not at that time know, standing afar off, near the

steps of the altar. The apostle then descended into the ground and brought up a lance, which he gave into his hand, telling him that it was the very lance that had opened the side whence had flowed the salvation of the world. With tears of joy he held the holy lance, and implored the apostle to allow him to take it away and deliver it into the hands of Count Raymond. The apostle refused, and buried the lance again in the ground, commanding him, when the city was won from the infidels, to go with twelve chosen men, and dig it up again in the same place. The apostle then transported him back to his tent, and the two vanished from his sight. He had neglected, he said, to deliver this message, afraid that his wonderful tale would not obtain credence from men of such high rank. After some days he again saw the holy vision, as he was gone out of the camp to look for food. This time the divine eyes of the younger looked reproachfully upon him. He implored the apostle to choose some one else more fitted for the mission, but the apostle refused, and smote him with a disorder of the eyes, as a punishment for his disobedience. With an obstinacy unaccountable even to himself, he had still delayed. A third time the apostle and his companion had appeared to him, as he was in a tent with his master William at St. Simeon. On that occasion St. Andrew told him to bear his command to the Count of Toulouse not to bathe in the waters of the Jordan when he came to it, but to cross over in a boat, clad in a shirt and breeches of linen, which he should sprinkle with the sacred waters of the river. These clothes he was afterwards to preserve along with the holy lance. His master William, although he could not see the saint, distinctly heard the voice giving orders to that effect. Again he neglected to execute the commission, and again the saints appeared to him, when he was at the port of Mamistra,

about to sail for Cyprus, and St. Andrew threatened him with eternal perdition if he refused longer. Upon this he made up his mind to divulge all that had been revealed to him.

The Count of Toulouse, who, in all probability, concocted this tale with the priest, appeared struck with the recital, and sent immediately for the Bishop of Puy and Raymond of Altapulto. The bishop at once expressed his disbelief of the whole story, and refused to have any thing to do in the matter. The Count of Toulouse, on the contrary, saw abundant motives, if not for believing, for pretending to believe; and, in the end, he so impressed upon the mind of the bishop the advantage that might be derived from it, in working up the popular mind to its former excitement, that the latter reluctantly agreed to make search in due form for the holy weapon. The day after the morrow was fixed upon for the ceremony; and, in the mean time, Peter was consigned to the care of Raymond, the count's chaplain, in order that no profane curiosity might have an opportunity of cross-examining him, and putting him to a nonplus.

Twelve devout men were forthwith chosen for the undertaking, among whom were the Count of Toulouse and his chaplain. They began digging at sunrise, and continued unwearied till near sunset, without finding the lance; they might have dug till this day with no better success, had not Peter himself sprung into the pit, praying to God to bring the lance to light, for the strengthening and victory of his people. Those who hide know where to find; and so it was with Peter, for both he and the lance found their way into the hole at the same time. On a sudden, he and Raymond the chaplain beheld its point in the earth, and Raymond, drawing it forth, kissed it with tears of joy, in sight of the multitude which had assembled in the

church. It was immediately enveloped in a rich purple cloth, already prepared to receive it, and exhibited in this state to the faithful, who made the building resound with their shouts of gladness.



THE HOLY LANCE.

Peter had another vision the same night, and became from that day forth “dreamer of dreams” in general to the army. He stated on the following day, that the Apostle Andrew and “the youth with the divine aspect” appeared to him again, and directed that the Count of Toulouse, as a reward for his persevering piety, should carry the Holy Lance at the head of the army, and that the day on which it was found should be observed as a solemn festival throughout Christendom. St. Andrew shewed him at the same time the holes in the feet and hands of his benign companion; and he became convinced that he stood in the awful presence of THE REDEEMER.

Peter gained so much credit by his visions that dreaming became contagious. Other monks beside himself were visited by the saints, who promised victory to the host if it would valiantly hold out to the last, and crowns of eternal glory to those who fell in the fight. Two deserters, wearied of the fatigues and privations of the war, who had

stealthily left the camp, suddenly returned, and seeking Bohemund, told him that they had been met by two apparitions, who, with great anger, had commanded them to return. The one of them said, that he recognised his brother, who had been killed in battle some months before, and that he had a halo of glory around his head. The other, still more hardy, asserted that the apparition which had spoken to him was the Saviour himself, who had promised eternal happiness as his reward if he returned to his duty, but the pains of eternal fire if he rejected the cross. No one thought of disbelieving these men. The courage of the army immediately revived; despondency gave way to hope; every arm grew strong again, and the pangs of hunger were for a time disregarded. The enthusiasm which had led them from Europe, burned forth once more as brightly as ever, and they demanded, with loud cries, to be led against the enemy. The leaders were not unwilling. In a battle lay their only chance of salvation; and although Godfrey, Bohemund, and Tancred received the story of the lance with much suspicion, they were too wise to throw discredit upon an imposture which bade fair to open the gates of victory.

Peter the Hermit was previously sent to the camp of Kerbogha to propose that the quarrel between the two religions should be decided by a chosen number of the bravest soldiers of each army. Kerbogha turned from him with a look of contempt, and said he could agree to no proposals from a set of such miserable beggars and robbers. With this uncourteous answer Peter returned to Antioch. Preparations were immediately commenced for an attack upon the enemy: the latter continued to be perfectly well informed of all the proceedings of the Christian camp. The citadel of Antioch, which remained in their possession, overlooked the town, and the commander of the

fortress could distinctly see all that was passing within. On the morning of the 28th of June, 1098, a black flag, hoisted from its highest tower, announced to the besieging army that the Christians were about to sally forth.

The Moslem leaders knew the sad inroads that famine and disease had made upon the numbers of the foe; they knew that not above two hundred of the knights had horses to ride upon, and that the foot soldiers were sick and emaciated; but they did not know the almost incredible valour which superstition had infused into their hearts. The story of the lance they treated with the most supreme contempt, and, secure of an easy victory, they gave themselves no trouble in preparing for the onslaught. It is related that Kerbogha was playing a game at chess, when the black flag on the citadel gave warning of the enemy's approach, and that, with true oriental coolness, he insisted upon finishing the game ere he bestowed any of his attention upon a foe so unworthy. The defeat of his advanced post of two thousand men aroused him from his apathy.

The Crusaders, after this first victory, advanced joyfully towards the mountains, hoping to draw the Turks to a place where their cavalry would be unable to manoeuvre. Their spirits were light and their courage high, as, led on by the Duke of Normandy, Count Robert of Flanders, and Hugh of Vermandois, they came within sight of the splendid camp of the enemy. Godfrey of Bouillon and Adhemar Bishop of Puy, followed immediately after these leaders, the latter clad in complete armour, and bearing the Holy Lance within sight of the whole army: Bohemund and Tancred brought up the rear.

Kerbogha, aware at last that his enemy was not so despicable, took vigorous measures to remedy his mistake, and, preparing himself to meet the Christians in front, he despatched the Sultan Soliman of Roum to attack them in the rear. To conceal this movement, he set fire to the dried weeds and grass with which the ground was covered, and Soliman, taking a wide circuit with his cavalry, succeeded, under cover of the smoke, in making good his position in the rear. The battle raged furiously in front; the arrows of the Turks fell thick as hail, and their well-trained squadrons trod the Crusaders under their hoofs like stubble. Still the affray was doubtful; for the Christians had the advantage of the ground, and were rapidly gaining upon the enemy, when the overwhelming forces of Soliman arrived in the rear. Godfrey and Tancred flew to the rescue of Bohemund, spreading dismay in the Turkish ranks by their fierce impetuosity. The Bishop of Puy was left almost alone with the Provençals to oppose the legions commanded by Kerbogha in person; but the presence of the Holy Lance made a hero of the meanest soldier in his train. Still, however, the numbers of the enemy seemed interminable. The Christians, attacked on every side, began at last to give way, and the Turks made sure of victory.

At this moment a cry was raised in the Christian host that the saints were fighting on their side. The battle-field was clear of the smoke from the burning weeds, which had curled away, and hung in white clouds of fantastic shape on the brow of the distant mountains. Some imaginative zealot, seeing this dimly through the dust of the battle, called out to his fellows, to look at the army of saints, clothed in white, and riding upon white horses, that were pouring over the hills to the rescue. All eyes were immediately turned to the distant

smoke; faith was in every heart; and the old battle-cry, *God wills it!* *God wills it!* resounded through the field, as every soldier, believing that God was visibly sending his armies to his aid, fought with an energy unfelt before. A panic seized the Persian and Turkish hosts, and they gave way in all directions. In vain Kerbogha tried to rally them. Fear is more contagious than enthusiasm, and they fled over the mountains like deer pursued by the hounds. The two leaders, seeing the uselessness of further efforts, fled with the rest; and that immense army was scattered over Palestine, leaving nearly seventy thousand of its dead upon the field of battle.

Their magnificent camp fell into the hands of the enemy, with its rich stores of corn, and its droves of sheep and oxen. Jewels, gold, and rich velvets in abundance were distributed among the army. Tancred followed the fugitives over the hills, and reaped as much plunder as those who had remained in the camp. The way, as they fled, was covered with valuables, and horses of the finest breed of Arabia became so plentiful that every knight of the Christians was provided with a steed. The Crusaders, in this battle, acknowledge to have lost nearly ten thousand men.

Their return to Antioch was one of joy indeed: the citadel was surrendered at once, and many of the Turkish garrison embraced the Christian faith, and the rest were suffered to depart. A solemn thanksgiving was offered up by the Bishop of Puy, in which the whole army joined, and the Holy Lance was visited by every soldier.

The enthusiasm lasted for some days, and the army loudly demanded to be led forward to Jerusalem, the grand goal of all their wishes: but none of their leaders was anxious to move;—the more prudent among them, such as Godfrey and Tancred, for reasons of

expediency; and the more ambitious, such as the Count of Toulouse and Bohemund, for reasons of self-interest. Violent dissensions sprang up again between all the chiefs. Raymond of Toulouse, who was left at Antioch to guard the town, had summoned the citadel to surrender, as soon as he saw that there was no fear of any attack upon the part of the Persians; and the other chiefs found, upon their return, his banner waving on its walls. This had given great offence to Bohemund, who had stipulated the principality of Antioch as his reward for winning the town in the first instance. Godfrey and Tancred supported his claim, and, after a great deal of bickering, the flag of Raymond was lowered from the tower, and that of Bohemund hoisted in its stead, who assumed from that time the title of Prince of Antioch. Raymond, however, persisted in retaining possession of one of the city gates and its adjacent towers, which he held for several months, to the great annoyance of Bohemund and the scandal of the army. The count became in consequence extremely unpopular, although his ambition was not a whit more unreasonable than that of Bohemund himself, nor of Baldwin, who had taken up his quarters at Edessa, where he exercised the functions of a petty sovereign.

The fate of Peter Barthelemy deserves to be recorded. Honours and consideration had come thick upon him after the affair of the lance, and he consequently felt bound in conscience to continue the dreams which had made him a personage of so much importance. The mischief of it was, that, like many other liars, he had a very bad memory, and he contrived to make his dreams contradict each other in the most palpable manner. St. John one night appeared to him, and told one tale; while, a week after, St. Paul told a totally different story, and held out hopes quite incompatible with those of his

apostolic brother. The credulity of that age had a wide maw, and Peter's visions must have been absurd and outrageous indeed, when the very men who had believed in the lance refused to swallow any more of his wonders. Bohemund at last, for the purpose of annoying the Count of Toulouse, challenged poor Peter to prove the truth of his story of the lance by the fiery ordeal. Peter could not refuse a trial so common in that age, and being besides encouraged by the count and his chaplain Raymond, an early day was appointed for the ceremony. The previous night was spent in prayer and fasting, according to custom, and Peter came forth in the morning bearing the lance in his hand, and walked boldly up to the fire. The whole army gathered round, impatient for the result, many thousands still believing that the lance was genuine, and Peter a holy man. Prayers having been said by Raymond d'Agilles, Peter walked into the flames, and had got nearly through, when pain caused him to lose his presence of mind: the heat too affected his eyes, and, in his anguish, he turned round unwittingly, and passed through the fire again, instead of stepping out of it, as he should have done. The result was, that he was burned so severely that he never recovered, and, after lingering for some days, he expired in great agony.

Most of the soldiers were suffering either from wounds, disease, or weariness; and it was resolved by Godfrey,—the tacitly acknowledged chief of the enterprise,—that the army should have time to refresh itself ere they advanced upon Jerusalem. It was now July, and he proposed that they should pass the hot months of August and September within the walls of Antioch, and march forward in October with renewed vigour, and numbers increased by fresh arrivals from Europe. This advice was finally adopted, although the

enthusiasts of the army continued to murmur at the delay. In the mean time the Count of Vermandois was sent upon an embassy to the Emperor Alexius at Constantinople, to reproach him for his base desertion of the cause, and urge him to send the reinforcements he had promised. The count faithfully executed his mission (of which, by the way, Alexius took no notice whatever), and remained for some time at Constantinople, till his zeal, never very violent, totally evaporated. He then returned to France, sick of the Crusade, and determined to intermeddle with it no more.

The chiefs, though they had determined to stay at Antioch for two months, could not remain quiet for so long a time. They would, in all probability, have fallen upon each other, had there been no Turks in Palestine upon whom they might vent their impetuosity. Godfrey proceeded to Edessa, to aid his brother Baldwin in expelling the Saracens from his principality, and the other leaders carried on separate hostilities against them as caprice or ambition dictated. At length the impatience of the army to be led against Jerusalem became so great that the chiefs could no longer delay, and Raymond, Tancred, and Robert of Normandy marched forward with their divisions, and laid siege to the small but strong town of Marah. With their usual improvidence, they had not food enough to last a beleaguering army for a week. They suffered great privations in consequence, till Bohemund came to their aid and took the town by storm. In connexion with this siege, the chronicler, Raymond d'Agilles (the same Raymond the chaplain who figured in the affair of the Holy Lance), relates a legend, in the truth of which he devoutly believed, and upon which Tasso has founded one of the most beautiful passages of his poem. It is worth preserving, as shewing the

spirit of the age and the source of the extraordinary courage manifested by the Crusaders on occasions of extreme difficulty. "One day," says Raymond, "Anselme de Ribeaumont beheld young Engelram, the son of the Count de St. Paul, who had been killed at Marah, enter his tent. 'How is it,' said Anselme to him, 'that you, whom I saw lying dead on the field of battle, are full of life?'—'You must know,' replied Engelram, 'that those who fight for Jesus Christ never die.' 'But whence,' resumed Anselme, 'comes that strange brightness that surrounds you?' Upon this Engelram pointed to the sky, where Anselme saw a palace of diamond and crystal. 'It is thence,' said he, 'that I derive the beauty which surprises you. My dwelling is there; a still finer one is prepared for you, and you shall soon come to inhabit it. Farewell! we shall meet again to-morrow.' With these words Engelram returned to heaven. Anselme, struck by the vision, sent the next morning for the priests, received the sacrament, and although full of health, took a last farewell of all his friends, telling them that he was about to leave this world. A few hours afterwards, the enemy having made a sortie, Anselme went out against them sword in hand, and was struck on the forehead by a stone from a Turkish sling, which sent him to heaven, to the beautiful palace that was prepared for him."



SHRINE OF THE NATIVITY.

New disputes arose between the Prince of Antioch and the Count of Toulouse with regard to the capture of this town, which were with the utmost difficulty appeased by the other chiefs. Delays also took place in the progress of the army, especially before Archas, and the soldiery were so exasperated that they were on the point of choosing new leaders to conduct them to Jerusalem. Godfrey, upon this, set fire to his camp at Archas, and marched forward. He was immediately joined by hundreds of the Provençals of the Count of Toulouse. The latter, seeing the turn affairs were taking, hastened after them, and the whole host proceeded towards the holy city, so long desired amid sorrow, and suffering, and danger. At Emmaus they were met by a deputation from the Christians of Bethlehem,

praying for immediate aid against the oppression of the infidels. The very name of Bethlehem, the birthplace of the Saviour, was music to their ears, and many of them wept with joy to think they were approaching a spot so hallowed. Albert of Aix informs us that their hearts were so touched that sleep was banished from the camp, and that, instead of waiting till the morning's dawn to recommence their march, they set out shortly after midnight, full of hope and enthusiasm. For upwards of four hours the mail-clad legions tramped stedfastly forward in the dark, and when the sun arose in unclouded splendour, the towers and pinnacles of Jerusalem gleamed upon their sight. All the tender feelings of their nature were touched; no longer brutal fanatics, but meek and humble pilgrims, they knelt down upon the sod, and with tears in their eyes, exclaimed to one another "*Jerusalem! Jerusalem!*" Some of them kissed the holy ground, others stretched themselves at full length upon it, in order that their bodies might come in contact with the greatest possible extent of it, and others prayed aloud. The women and children who had followed the camp from Europe, and shared in all its dangers, fatigues, and privations, were more boisterous in their joy; the former from long-nourished enthusiasm, and the latter from mere imitation,⁹ and prayed, and wept, and laughed till they almost put the more sober to the blush.



THE PILGRIMS AT THE FIRST SIGHT OF JERUSALEM.

The first ebullition of their gladness having subsided, the army marched forward, and invested the city on all sides. The assault was almost immediately begun; but after the Christians had lost some of their bravest knights, that mode of attack was abandoned, and the army commenced its preparations for a regular siege. Mangonels, moveable towers, and battering-rams, together with a machine called a sow, made of wood, and covered with raw hides, inside of which miners worked to undermine the walls, were forthwith constructed; and to restore the courage and discipline of the army, which had suffered from the unworthy dissensions of the chiefs, the latter held out the hand of friendship to each other, and Tancred and the Count of Toulouse embraced in sight of the whole camp. The clergy aided the cause with their powerful voice, and preached union and goodwill to the highest and the lowest. A solemn procession was also ordered round the city, in which the entire army joined, prayers being offered up at every spot which gospel records had taught them to consider as peculiarly sacred.

The Saracens upon the ramparts beheld all these manifestations without alarm. To incense the Christians, whom they despised, they constructed rude crosses, and fixed them upon the walls, and spat

upon and pelted them with dirt and stones. This insult to the symbol of their faith raised the wrath of the Crusaders to that height that bravery became ferocity, and enthusiasm madness. When all the engines of war were completed, the attack was recommenced, and every soldier of the Christian army fought with a vigour which the sense of private wrong invariably inspires. Every man had been personally outraged, and the knights worked at the battering-rams with as much readiness as the meanest soldiers. The Saracen arrows and balls of fire fell thick and fast among them, but the tremendous rams still heaved against the walls, while the best marksmen of the host were busily employed in the several floors of the moveable towers in dealing death among the Turks upon the battlements. Godfrey, Raymond, Tancred, and Robert of Normandy, each upon his tower, fought for hours with unwearied energy, often repulsed, but ever ready to renew the struggle. The Turks, no longer despising the enemy, defended themselves with the utmost skill and bravery till darkness brought a cessation of hostilities. Short was the sleep that night in the Christian camp. The priests offered up solemn prayers in the midst of the attentive soldiery for the triumph of the cross in this last great struggle; and as soon as morning dawned, every one was in readiness for the affray. The women and children lent their aid, the latter running unconcerned to and fro while the arrows fell fast around them, bearing water to the thirsty combatants. The saints were believed to be aiding their efforts, and the army, impressed with this idea, surmounted difficulties under which a force thrice as numerous, but without their faith, would have quailed and been defeated. Raymond of Toulouse at last forced his way into the city by escalade, while at the very same moment

Tancred and Robert of Normandy succeeded in bursting open one of the gates. The Turks flew to repair the mischief, and Godfrey of Bouillon, seeing the battlements comparatively deserted, let down the drawbridge of his moveable tower, and sprang forward, followed by all the knights of his train. In an instant after, the banner of the cross floated upon the walls of Jerusalem. The Crusaders, raising once more their redoubtable war-cry, rushed on from every side, and the city was taken. The battle raged in the streets for several hours, and the Christians, remembering their insulted faith, gave no quarter to young or old, male or female, sick or strong. Not one of the leaders thought himself at liberty to issue orders for staying the carnage, and if he had, he would not have been obeyed. The Saracens fled in great numbers to the mosque of Soliman, but they had not time to fortify themselves within it ere the Christians were upon them. Ten thousand persons are said to have perished in that building alone.

Peter the Hermit, who had remained so long under the veil of neglect, was repaid that day for all his zeal and all his sufferings. As soon as the battle was over, the Christians of Jerusalem issued forth from their hiding-places to welcome their deliverers. They instantly recognised the Hermit as the pilgrim who, years before, had spoken to them so eloquently of the wrongs and insults they had endured, and promised to stir up the princes and people of Europe in their behalf. They clung to the skirts of his garments in the fervour of their gratitude, and vowed to remember him for ever in their prayers. Many of them shed tears about his neck, and attributed the deliverance of Jerusalem solely to his courage and perseverance. Peter afterwards held some ecclesiastical office in the holy city, but what it was, or what was his ultimate fate, history has forgotten to

inform us. Some say that he returned to France and founded a monastery, but the story does not rest upon sufficient authority.



SIEGE OF JERUSALEM.

The grand object for which the popular swarms of Europe had forsaken their homes was now accomplished. The Moslem mosques of Jerusalem were converted into churches for a purer faith, and the mount of Calvary and the sepulchre of Christ were profaned no longer by the presence or the power of the infidel. Popular frenzy had fulfilled its mission, and, as a natural consequence, it began to subside from that time forth. The news of the capture of Jerusalem brought numbers of pilgrims from Europe, and, among others, Stephen count of Chartres and Hugh of Vermandois, to atone for their desertion; but nothing like the former enthusiasm existed among the nations.

Thus then ends the history of the first Crusade. For the better understanding of the second, it will be necessary to describe the interval between them, and to enter into a slight sketch of the history of Jerusalem under its Latin kings, the long and fruitless wars they continued to wage with the unvanquished Saracens, and the poor and miserable results which sprang from so vast an expenditure of zeal, and so deplorable a waste of human life.



JERUSALEM.

The necessity of having some recognised chief was soon felt by the Crusaders, and Godfrey de Bouillon, less ambitious than Bohemund or Raymond of Toulouse, gave his cold consent to wield a sceptre which the latter chiefs would have clutched with eagerness. He was hardly invested with the royal mantle before the Saracens menaced his capital. With much vigour and judgment he exerted himself to follow up the advantages he had gained, and marching out to meet the enemy before they had time to besiege him in Jerusalem, he gave them battle at Ascalon, and defeated them with great loss. He did not, however, live long to enjoy his new dignity, being seized with a

fatal illness when he had only reigned nine months. To him succeeded his brother, Baldwin of Edessa. The latter monarch did much to improve the condition of Jerusalem and to extend its territory, but was not able to make a firm footing for his successors. For fifty years, in which the history of Jerusalem is full of interest to the historical student, the Crusaders were exposed to fierce and constant hostilities, often gaining battles and territory, and as often losing them, but becoming every day weaker and more divided, while the Saracens became stronger and more united to harass and root them out. The battles of this period were of the most chivalrous character, and deeds of heroism were done by the handful of brave knights that remained in Syria, which have hardly their parallel in the annals of war. In the course of time, however, the Christians could not avoid feeling some respect for the courage, and admiration for the polished manners and advanced civilisation of the Saracens, so much superior to the rudeness and semi-barbarism of Europe at that day. Difference of faith did not prevent them from forming alliances with the dark-eyed maidens of the East. One of the first to set the example of taking a Paynim spouse was King Baldwin himself, and these connexions in time became not only frequent, but almost universal, among such of the knights as had resolved to spend their lives in Palestine. These Eastern ladies were obliged, however, to submit to the ceremony of baptism before they could be received to the arms of a Christian lord. These, and their offspring, naturally looked upon the Saracens with less hatred than did the zealots who conquered Jerusalem, and who thought it a sin deserving the wrath of God to spare an unbeliever. We find, in consequence, that the most obstinate battles waged during the reigns of the later kings of

Jerusalem were fought by the new and raw levies who from time to time arrived from Europe, lured by the hope of glory or spurred by fanaticism. The latter broke without scruple the truces established between the original settlers and the Saracens, and drew down severe retaliation upon many thousands of their brethren in the faith, whose prudence was stronger than their zeal, and whose chief desire was to live in peace.



BIBLE OF BALDWIN'S QUEEN.

Things remained in this unsatisfactory state till the close of the year 1145, when Edessa, the strong frontier town of the Christian kingdom, fell into the hands of the Saracens. The latter were commanded by Zenghi, a powerful and enterprising monarch, and, after his death, by his son Nourheddin, as powerful and enterprising as his father. An unsuccessful attempt was made by the Count of Edessa to regain the fortress, but Nourheddin with a large army came to the rescue, and after defeating the count with great slaughter, marched into Edessa and caused its fortifications to be razed to the ground, that the town might never more be a bulwark of defence for the kingdom of Jerusalem. The road to the capital was now open, and consternation seized the hearts of the Christians.

Nourheddin, it was known, was only waiting for a favourable opportunity to advance upon Jerusalem, and the armies of the cross, weakened and divided, were not in a condition to make any available resistance. The clergy were filled with grief and alarm, and wrote repeated letters to the Pope and the sovereigns of Europe, urging the expediency of a new Crusade for the relief of Jerusalem. By far the greater number of the priests of Palestine were natives of France, and these naturally looked first to their own country. The solicitations they sent to Louis VII. were urgent and oft repeated, and the chivalry of France began to talk once more of arming in defence of the birthplace of Jesus. The kings of Europe, whose interest it had not been to take any part in the first Crusade, began to bestir themselves in this; and a man appeared, eloquent as Peter the Hermit, to arouse the people as that preacher had done.

We find, however, that the enthusiasm of the second did not equal that of the first Crusade; in fact, the mania had reached its climax in the time of Peter the Hermit, and decreased regularly from that period. The third Crusade was less general than the second, and the fourth than the third, and so on, until the public enthusiasm was quite extinct, and Jerusalem returned at last to the dominion of its old masters without a convulsion in Christendom. Various reasons have been assigned for this; and one very generally put forward is, that Europe was wearied with continued struggles, and had become sick of "precipitating itself upon Asia." M. Guizot, in his admirable lectures upon European civilisation, successfully combats this opinion, and offers one of his own, which is far more satisfactory. He says, in his eighth lecture, "It has been often repeated that Europe was tired of continually invading Asia. This expression appears to me

exceedingly incorrect. It is not possible that human beings can be wearied with what they have not done—that the labours of their forefathers can fatigue them. Weariness is a personal, not an inherited feeling. The men of the thirteenth century were not fatigued by the Crusades of the twelfth. They were influenced by another cause. A great change had taken place in ideas, sentiments, and social conditions. The same desires and the same wants were no longer felt. The same things were no longer believed. The people refused to believe what their ancestors were persuaded of.”

This is, in fact, the secret of the change; and its truth becomes more apparent as we advance in the history of the Crusades, and compare the state of the public mind at the different periods when Godfrey of Bouillon, Louis VII., and Richard I., were chiefs and leaders of the movement. The Crusades themselves were the means of operating a great change in national ideas, and advancing the civilisation of Europe. In the time of Godfrey, the nobles were all-powerful and all-oppressive, and equally obnoxious to kings and people. During their absence along with that portion of the community the deepest sunk in ignorance and superstition, both kings and people fortified themselves against the renewal of aristocratic tyranny, and in proportion as they became free became civilised. It was during this period that in France, the grand centre of the crusading madness, the *communes* began to acquire strength, and the monarch to possess a practical and not a merely theoretic authority. Order and comfort began to take root, and, when the second Crusade was preached, men were in consequence much less willing to abandon their homes than they had been during the first. Such pilgrims as had returned from the Holy Land came back with

minds more liberal and expanded than when they set out. They had come in contact with a people more civilised than themselves; they had seen something more of the world, and had lost some portion, however small, of the prejudice and bigotry of ignorance. The institution of chivalry had also exercised its humanising influence, and coming bright and fresh through the ordeal of the Crusades, had softened the character and improved the hearts of the aristocratic order. The *Trouvères* and *Troubadours*, singing of love and war in strains pleasing to every class of society, helped to root out the gloomy superstitions which, at the first Crusade, filled the minds of all those who were able to think. Men became in consequence less exclusively under the mental thralldom of the priesthood, and lost much of the credulity which formerly distinguished them.

The Crusades appear never to have excited so much attention in England as on the continent of Europe; not because the people were less fanatical than their neighbours, but because they were occupied in matters of graver interest. The English were suffering too severely from the recent successful invasion of their soil, to have much sympathy to bestow upon the distresses of people so far away as the Christians of Palestine; and we find that they took no part in the first Crusade, and very little in the second. Even then those who engaged in it were chiefly Norman knights and their vassals, and not the Saxon franklins and population, who no doubt thought, in their sorrow, as many wise men have thought since, that charity should begin at home.

Germany was productive of more zeal in the cause, and her raw uncivilised hordes continued to issue forth under the banners of the cross in numbers apparently undiminished, when the enthusiasm

had long been on the wane in other countries. They were sunk at that time in a deeper slough of barbarism than the livelier nations around them, and took, in consequence, a longer period to free themselves from their prejudices. In fact the second Crusade drew its chief supplies of men from that quarter, where alone the expedition can be said to have retained any portion of popularity.

Such was the state of mind of Europe when Pope Eugenius, moved by the reiterated entreaties of the Christians of Syria, commissioned St. Bernard to preach a new Crusade. St. Bernard was a man eminently qualified for the mission. He was endowed with an eloquence of the highest order, could move an auditory to tears, or laughter, or fury, as it pleased him, and had led a life of such rigid and self-denying virtue, that not even calumny could lift her finger and point it at him. He had renounced high prospects in the Church, and contented himself with the simple abbacy of Clairvaux, in order that he might have the leisure he desired, to raise his powerful voice against abuses wherever he found them. Vice met in him an austere and uncompromising reprovener; no man was too high for his reproach, and none too low for his sympathy. He was just as well suited for his age as Peter the Hermit had been for the age preceding. He appealed more to the reason, his predecessor to the passions; Peter the Hermit collected a mob, while St. Bernard collected an army. Both were endowed with equal zeal and perseverance, springing in the one from impulse, and in the other from conviction, and a desire to increase the influence of the Church, that great body of which he was a pillar and an ornament.



CATHEDRAL OF VEZELAI.

One of the first converts he made was in himself a host. Louis VII. was both superstitious and tyrannical, and, in a fit of remorse for the infamous slaughter he had authorised at the sacking of Vitry, he made a vow to undertake the journey to the Holy Land.¹⁰ He was in this disposition when St. Bernard began to preach, and wanted but little persuasion to embark in the cause. His example had great influence upon the nobility, who, impoverished as many of them were by the sacrifices made by their fathers in the holy wars, were anxious to repair their ruined fortunes by conquests on a foreign shore. These took the field with such vassals as they could command, and in a very short time an army was raised amounting to two hundred thousand men. At Vezelai the monarch received the cross from the hands of St. Bernard, on a platform elevated in sight of all the people. Several nobles, three bishops, and his queen, Eleanor of Aquitaine, were present at this ceremony, and enrolled themselves

under the banner of the cross, St. Bernard cutting up his red sacerdotal vestments, and making crosses of them, to be sewn on the shoulders of the people. An exhortation from the Pope was read to the multitude, granting remission of their sins to all who should join the Crusade, and directing that no man on that holy pilgrimage should encumber himself with heavy baggage and vain superfluities, and that the nobles should not travel with dogs or falcons, to lead them from the direct road, as had happened to so many during the first Crusade.

The command of the army was offered to St. Bernard; but he wisely refused to accept a station for which his habits had unqualified him. After consecrating Louis with great solemnity, at St. Denis, as chief of the expedition, he continued his course through the country, stirring up the people wherever he went. So high an opinion was entertained of his sanctity, that he was thought to be animated by the spirit of prophecy, and to be gifted with the power of working miracles. Many women, excited by his eloquence, and encouraged by his predictions, forsook their husbands and children, and, clothing themselves in male attire, hastened to the war. St. Bernard himself wrote a letter to the Pope detailing his success, and stating, that in several towns there did not remain a single male inhabitant capable of bearing arms, and that every where castles and towns were to be seen filled with women weeping for their absent husbands. But in spite of this apparent enthusiasm, the numbers who really took up arms were inconsiderable, and not to be compared to the swarms of the first Crusade. A levy of no more than two hundred thousand men, which was the utmost the number amounted to, could hardly have depopulated a country like France, to the extent mentioned by

St. Bernard. His description of the state of the country appears, therefore, to have been much more poetical than true.

Suger, the able minister of Louis, endeavoured to dissuade him from undertaking so long a journey at a time when his own dominions so much needed his presence. But the king was pricked in his conscience by the cruelties of Vitry, and was anxious to make the only reparation which the religion of that day considered sufficient. He was desirous, moreover, of testifying to the world, that though he could brave the temporal power of the Church when it encroached upon his prerogatives, he could render all due obedience to its spiritual decrees whenever it suited his interest or tallied with his prejudices to do so. Suger, therefore, implored in vain, and Louis received the pilgrim's staff at St. Denis, and made all preparations for his pilgrimage.

In the mean time St. Bernard passed into Germany, where similar success attended his preaching. The renown of his sanctity had gone before him, and he found every where an admiring audience. Thousands of people, who could not understand a word he said, flocked around him to catch a glimpse of so holy a man; and the knights enrolled themselves in great numbers in the service of the cross, each receiving from his hands the symbol of the cause. But the people were not led away as in the days of Gottschalk. We do not find that they rose in such tremendous masses of two and three hundred thousand men, swarming over the country like a plague of locusts. Still the enthusiasm was very great. The extraordinary tales that were told and believed of the miracles worked by the preacher brought the country people from far and near. Devils were said to vanish at his sight, and diseases of the most malignant nature to be cured by his

touch.¹¹ The Emperor Conrad caught at last the contagion from his subjects, and declared his intention to follow the cross.

The preparations were carried on so vigorously under the orders of Conrad, that in less than three months he found himself at the head of an army containing at least one hundred and fifty thousand effective men, besides a great number of women who followed their husbands and lovers to the war. One troop of them rode in the attitude and armour of men: their chief wore gilt spurs and buskins, and thence acquired the epithet of the golden-footed lady. Conrad was ready to set out long before the French monarch, and in the month of June 1147, he arrived before Constantinople, having passed through Hungary and Bulgaria without offence to the inhabitants.



PILGRIM'S STAFF.

Manuel Comnenus, the Greek emperor, successor not only to the throne but to the policy of Alexius, looked with alarm upon the new levies who had come to eat up his capital and imperil its tranquillity. Too weak to refuse them a passage through his dominions, too distrustful of them to make them welcome when they came, and too little assured of the advantages likely to result to himself from the war, to feign a friendship which he did not feel, the Greek emperor

gave offence at the very outset. His subjects, in the pride of superior civilisation, called the Germans barbarians; while the latter, who, if semi-barbarous, were at least honest and straightforward, retorted upon the Greeks by calling them double-faced knaves and traitors. Disputes continually arose between them, and Conrad, who had preserved so much good order among his followers during their passage, was unable to restrain their indignation when they arrived at Constantinople. For some offence or other which the Greeks had given them, but which is rather hinted at than stated by the scanty historians of the day, the Germans broke into the magnificent pleasure-garden of the emperor, where he had a valuable collection of tame animals, for which the grounds had been laid out in woods, caverns, groves, and streams, that each might follow in captivity his natural habits. The enraged Germans, meriting the name of barbarians that had been bestowed upon them, laid waste this pleasant retreat, and killed or let loose the valuable animals it contained. Manuel, who is said to have beheld the devastation from his palace windows without power or courage to prevent it, was completely disgusted with his guests, and resolved, like his predecessor Alexius, to get rid of them on the first opportunity. He sent a message to Conrad respectfully desiring an interview, but the German refused to trust himself within the walls of Constantinople. The Greek emperor, on his part, thought it compatible neither with his dignity nor his safety to seek the German, and several days were spent in insincere negotiations. Manuel at length agreed to furnish the crusading army with guides to conduct it through Asia Minor; and Conrad passed over the Hellespont with his forces, the advanced

guard being commanded by himself, and the rear by the warlike Bishop of Freysinghen.

Historians are almost unanimous in their belief that the wily Greek gave instructions to his guides to lead the army of the German emperor into dangers and difficulties. It is certain that, instead of guiding them through such districts of Asia Minor as afforded water and provisions, they led them into the wilds of Cappadocia, where neither was to be procured, and where they were suddenly attacked by the sultan of the Seljukian Turks, at the head of an immense force. The guides, whose treachery is apparent from this fact alone, fled at the first sight of the Turkish army, and the Christians were left to wage unequal warfare with their enemy, entangled and bewildered in desert wilds. Toiling in their heavy mail, the Germans could make but little effective resistance to the attacks of the Turkish light horse, who were down upon them one instant, and out of sight the next. Now in the front and now in the rear, the agile foe showered his arrows upon them, enticing them into swamps and hollows, from which they could only extricate themselves after long struggles and great losses. The Germans, confounded by this mode of warfare, lost all conception of the direction they were pursuing, and went back instead of forward. Suffering at the same time for want of provisions, they fell an easy prey to their pursuers. Count Bernhard, one of the bravest leaders of the German expedition, was surrounded, with his whole division, not one of whom escaped the Turkish arrows. The emperor himself had nearly fallen a victim, and was twice severely wounded. So persevering was the enemy, and so little able were the Germans to make even a shew of resistance, that when Conrad at last reached the city of Nice, he found that, instead of being at the head of

an imposing force of one hundred thousand foot and seventy thousand horse, he had but fifty or sixty thousand men, and these in the most worn and wearied condition.

Totally ignorant of the treachery of the Greek emperor, although he had been warned to beware of it, Louis VII. proceeded, at the head of his army, through Worms and Ratisbon, towards Constantinople. At Ratisbon he was met by a deputation from Manuel, bearing letters so full of hyperbole and flattery, that Louis is reported to have blushed when they were read to him by the Bishop of Langres. The object of the deputation was to obtain from the French king a promise to pass through the Grecian territories in a peaceable and friendly manner, and to yield to the Greek emperor any conquest he might make in Asia Minor. The first part of the proposition was immediately acceded to, but no notice was taken of the second and more unreasonable. Louis marched on, and, passing through Hungary, pitched his tents in the outskirts of Constantinople.

On his arrival, Manuel sent him a friendly invitation to enter the city at the head of a small train. Louis at once accepted it, and was met by the emperor at the porch of his palace. The fairest promises were made; every art that flattery could suggest was resorted to, and every argument employed, to induce him to yield his future conquests to the Greek. Louis obstinately refused to pledge himself, and returned to his army convinced that the emperor was a man not to be trusted. Negotiations were, however, continued for several days, to the great dissatisfaction of the French army. The news that arrived of a treaty entered into between Manuel and the Turkish sultan changed their dissatisfaction into fury, and the leaders demanded to be led against Constantinople, swearing that they

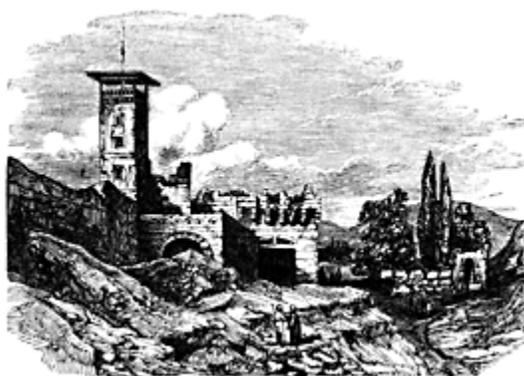
would raze the treacherous city to the ground. Louis did not feel inclined to accede to this proposal, and, breaking up his camp, he crossed over into Asia.

Here he heard, for the first time, of the mishaps of the German emperor, whom he found in a woful plight under the walls of Nice. The two monarchs united their forces, and marched together along the sea-coast to Ephesus; but Conrad, jealous, it would appear, of the superior numbers of the French, and not liking to sink into a vassal, for the time being, of his rival, withdrew abruptly with the remnant of his legions, and returned to Constantinople. Manuel was all smiles and courtesy. He condoled with the German so feelingly upon his losses, and cursed the stupidity or treachery of the guides with such apparent heartiness, that Conrad was half inclined to believe in his sincerity.

Louis, marching onward in the direction of Jerusalem, came up with the enemy on the banks of the Meander. The Turks contested the passage of the river, but the French bribed a peasant to point out a ford lower down: crossing the river without difficulty, they attacked the Turks with much vigour, and put them to flight. Whether the Turks were really defeated, or merely pretended to be so, is doubtful; but the latter supposition seems to be the true one. It is probable that it was part of a concerted plan to draw the invaders onwards to more unfavourable ground, where their destruction might be more certain. If such were the scheme, it succeeded to the heart's wish of its projectors. The Crusaders, on the third day after their victory, arrived at a steep mountain-pass, on the summit of which the Turkish host lay concealed so artfully, that not the slightest vestige of their presence could be perceived. "With labouring steps and slow,"

they toiled up the steep ascent, when suddenly a tremendous fragment of rock came bounding down the precipices with an awful crash, bearing dismay and death before it. At the same instant the Turkish archers started from their hiding-places, and discharged a shower of arrows upon the foot-soldiers, who fell by hundreds at a time. The arrows rebounded harmlessly against the iron mail of the knights, which the Turks observing, took aim at their steeds, and horse and rider fell down the steep into the rapid torrent which rushed below. Louis, who commanded the rear-guard, received the first intimation of the onslaught from the sight of the wounded and flying soldiers, and, not knowing the numbers of the enemy, he pushed vigorously forward to stay, by his presence, the panic which had taken possession of his army. All his efforts were in vain. Immense stones continued to be hurled upon them as they advanced, bearing men and horse before them; and those who succeeded in forcing their way to the top were met hand-to-hand by the Turks, and cast down headlong upon their companions. Louis himself fought with the energy of desperation, but had great difficulty to avoid falling into the enemy's hands. He escaped at last under cover of the night, with the remnant of his forces, and took up his position before Attalia. Here he restored the discipline and the courage of his disorganised and disheartened followers, and debated with his captains the plan that was to be pursued. After suffering severely both from disease and famine, it was resolved that they should march to Antioch, which still remained an independent principality under the successors of Bohemund of Tarentum. At this time the sovereignty was vested in the person of Raymond, the uncle of Eleanor of Aquitaine. This prince, presuming upon his relationship

to the French queen, endeavoured to withdraw Louis from the grand object of the Crusade—the defence of the kingdom of Jerusalem, and secure his co-operation in extending the limits and the power of his principality of Antioch. The Prince of Tripoli formed a similar design; but Louis rejected the offers of both, and marched, after a short delay, to Jerusalem. The Emperor Conrad was there before him, having left Constantinople with promises of assistance from Manuel Comnenus—assistance which never arrived, and was never intended.



DAMASCUS.

A great council of the Christian princes of Palestine, and the leaders of the Crusade, was then summoned, to discuss the future operations of the war. It was ultimately determined that it would further the cause of the cross in a greater degree if the united armies, instead of proceeding to Edessa, laid siege to the city of Damascus, and drove the Saracens from that strong position. This was a bold scheme, and, had it been boldly followed out, would have insured, in all probability, the success of the war. But the Christian leaders never learned from experience the necessity of union, that very soul of great enterprises. Though they all agreed upon the policy of the plan, yet every one had his own notions as to the means of executing it. The princes of Antioch and Tripoli were jealous of each other, and of

the king of Jerusalem. The Emperor Conrad was jealous of the king of France, and the king of France was disgusted with them all. But he had come out to Palestine in accordance with a solemn vow; his religion, though it may be called bigotry, was sincere; and he determined to remain to the very last moment that a chance was left of effecting any good for the cause he had set his heart on.

The siege of Damascus was accordingly commenced, and with so much ability and vigour that the Christians gained a considerable advantage at the very outset. For weeks the siege was pressed, till the shattered fortifications and diminishing resistance of the besieged gave evidence that the city could not hold out much longer. At that moment the insane jealousy of the leaders led to dissensions that soon caused the utter failure, not only of the siege but of the Crusade. A modern cookery-book, in giving a recipe for cooking a hare, says, "first catch your hare, and then kill it"—a maxim of indisputable wisdom. The Christian chiefs, on this occasion, had not so much sagacity, for they began a violent dispute among themselves for the possession of a city which was still unconquered. There being already a prince of Antioch and a prince of Tripoli, twenty claimants started for the principality of Damascus; and a grand council of the leaders was held to determine the individual on whom the honour should devolve. Many valuable days were wasted in this discussion, the enemy in the meanwhile gaining strength from their inactivity. It was at length, after a stormy deliberation, agreed that Count Robert of Flanders, who had twice visited the Holy Land, should be invested with the dignity. The other claimants refused to recognise him or to co-operate in the siege until a more equitable arrangement had been made. Suspicion filled the camp; the most sinister rumours of

intrigues and treachery were set afloat; and the discontented candidates withdrew at last to the other side of the city, and commenced operations on their own account without a probability of success. They were soon joined by the rest of the army. The consequence was that the weakest side of the city, and that on which they had already made considerable progress in the work of demolition, was left uncovered. The enemy was prompt to profit by the mistake, and received an abundant supply of provisions, and refortified the walls, before the Crusaders came to their senses again. When this desirable event happened, it was too late. Saph Eddin, the powerful emir of Mousoul, was in the neighbourhood, at the head of a large army, advancing by forced marches to the relief of the city. The siege was abruptly abandoned, and the foolish Crusaders returned to Jerusalem, having done nothing to weaken the enemy, but every thing to weaken themselves.

The freshness of enthusiasm had now completely subsided; even the meanest soldiers were sick at heart. Conrad, from whose fierce zeal at the outset so much might have been expected, was wearied with reverses, and returned to Europe with the poor remnant of his host. Louis lingered a short time longer, for very shame, but the pressing solicitations of his minister Suger induced him to return to France. Thus ended the second Crusade. Its history is but a chronicle of defeats. It left the kingdom of Jerusalem in a worse state than when it quitted Europe, and gained nothing but disgrace for its leaders, and discouragement for all concerned.

St. Bernard, who had prophesied a result so different, fell after this into some disrepute, and experienced, like many other prophets, the fate of being without honour in his own country. What made the

matter worse, he could not obtain it in any other. Still, however, there were not wanting zealous advocates to stand forward in his behalf, and stem the tide of incredulity, which, unopposed, would have carried away his reputation. The Bishop of Freysinghen declared that prophets were not always able to prophesy, and that the vices of the Crusaders drew down the wrath of heaven upon them. But the most ingenious excuse ever made for St. Bernard is to be found in his life by Geoffroi de Clairvaux, where he pertinaciously insists that the Crusade was not unfortunate. St. Bernard, he says, had prophesied a happy result, and that result could not be considered other than happy which had peopled heaven with so glorious an army of martyrs. Geoffroi was a cunning pleader, and, no doubt, convinced a few of the zealous; but plain people, who were not wanting even in those days, retained their own opinion, or, what amounts to the same thing, “were convinced against their will.”

We now come to the consideration of the third Crusade, and of the causes which rendered it necessary. The epidemic frenzy, which had been cooling ever since the issue of the first expedition, was now extinct, or very nearly so, and the nations of Europe looked with cold indifference upon the armaments of their princes. But chivalry had flourished in its natural element of war, and was now in all its glory. It continued to supply armies for the Holy Land when the popular ranks refused to deliver up their able-bodied swarms. Poetry, which, more than religion, inspired the third Crusade, was then but “*caviare* to the million,” who had other matters, of sterner import, to claim all their attention. But the knights and their retainers listened with delight to the martial and amatory strains of the minstrels, minnesängers, trouvères, and troubadours, and burned to win favour

in ladies' eyes by shewing prowess in the Holy Land. The third was truly the romantic era of the Crusades. Men fought then, not so much for the sepulchre of Jesus, and the maintenance of a Christian kingdom in the East, as to gain glory for themselves in the best and almost only field where glory could be obtained. They fought, not as zealots, but as soldiers; not for religion, but for honour; not for the crown of martyrdom, but for the favour of the lovely.



SEAL OF BARBAROSSA.

It is not necessary to enter into a detail of the events by which Saladin attained the sovereignty of the East, or how, after a succession of engagements, he planted the Moslem banner once more upon the battlements of Jerusalem. The Christian knights and population, including the grand orders of St. John, the Hospitallers, and the Templars, were sunk in an abyss of vice, and, torn by unworthy jealousies and dissensions, were unable to resist the well-trained armies which the wise and mighty Saladin brought forward to crush them. But the news of their fall created a painful sensation among the chivalry of Europe, whose noblest members were linked to the dwellers in Palestine by many ties, both of blood and friendship. The news of the great battle of Tiberias, in which Saladin defeated the Christian host with terrible slaughter, arrived first in Europe, and was followed in quick succession by that of the capture of Jerusalem, Antioch, Tripoli, and other cities. Dismay seized upon

the clergy. The Pope (Urban III.) was so affected by the news that he pined away for grief, and was scarcely seen to smile again, until he sank into the sleep of death.¹² His successor, Gregory VIII., felt the loss as acutely, but had better strength to bear it, and instructed all the clergy of the Christian world to stir up the people to arms for the recovery of the Holy Sepulchre. William Archbishop of Tyre, a humble follower in the path of Peter the Hermit, left Palestine to preach to the kings of Europe the miseries he had witnessed, and to incite them to the rescue. The renowned Frederick Barbarossa, the emperor of Germany, speedily collected an army, and passing over into Syria with less delay than had ever before awaited a crusading force, defeated the Saracens, and took possession of the city of Iconium. He was unfortunately cut off in the middle of his successful career, by imprudently bathing in the Cydnus¹³ while he was overheated, and the Duke of Suabia took the command of the expedition. The latter did not prove so able a general, and met with nothing but reverses, although he was enabled to maintain a footing at Antioch until assistance arrived from Europe.



HENRY II. OF ENGLAND.

Henry II. of England and Philip Augustus of France, at the head of their chivalry, supported the Crusade with all their influence, until wars and dissensions nearer home estranged them from it for a time. The two kings met at Gisors in Normandy in the month of January, 1188, accompanied by a brilliant train of knights and warriors. William of Tyre was present, and expounded the cause of the cross with considerable eloquence, and the whole assembly bound themselves by oath to proceed to Jerusalem. It was agreed at the same time that a tax, called Saladin's tithe, and consisting of the tenth part of all possessions, whether landed or personal, should be enforced over Christendom, upon every one who was either unable

or unwilling to assume the cross. The lord of every feof, whether lay or ecclesiastical, was charged to raise the tithe within his own jurisdiction; and any one who refused to pay his quota, became by that act the bondsman and absolute property of his lord. At the same time the greatest indulgence was shewn to those who assumed the cross; no man was at liberty to stay them by process of any kind, whether for debt, or robbery, or murder. The king of France, at the breaking up of the conference, summoned a parliament at Paris, where these resolutions were solemnly confirmed, while Henry II. did the same for his Norman possessions at Rouen, and for England at Geddington, in Northamptonshire. To use the words of an ancient chronicler,¹⁴ “he held a parliament about the voyage into the Holy Land, and troubled the whole land with the paying of tithes towards it.”



CHATEAU OF GISORS.



PHILIP AUGUSTUS.

But it was not England alone that was “troubled” by the tax. The people of France also looked upon it with no pleasant feelings, and appear from that time forth to have changed their indifference for the Crusade into aversion. Even the clergy, who were exceedingly willing that other people should contribute half, or even all their goods in furtherance of their favourite scheme, were not at all anxious to contribute a single sous themselves. Millot[15]¹⁵ relates that several of them cried out against the impost. Among the rest, the clergy of Rheims were called upon to pay their quota, but sent a deputation to the king, begging him to be contented with the aid of their prayers, as they were too poor to contribute in any other shape. Philip Augustus knew better, and by way of giving them a lesson, employed three nobles of the vicinity to lay waste the Church lands. The clergy, informed of the outrage, applied to the king for redress. “I will aid you with my prayers,” said the monarch condescendingly, “and will entreat those gentlemen to let the Church alone.” He did as he had promised, but in such a manner that the nobles, who appreciated the joke, continued their devastations as before. Again the clergy applied to the king. “What would you have of me?” he

replied, in answer to their remonstrances: “you gave me your prayers in my necessity, and I have given you mine in yours.” The clergy understood the argument, and thought it the wiser course to pay their quota of Saladin’s tithes without further parley.

This anecdote shews the unpopularity of the Crusade. If the clergy disliked to contribute, it is no wonder that the people felt still greater antipathy. But the chivalry of Europe was eager for the fray: the tithes were rigorously collected, and armies from England, France, Burgundy, Italy, Flanders, and Germany, were soon in the field. The two kings who were to have led it were, however, drawn into broils by an aggression of Richard duke of Guienne, better known as Richard Cœur de Lion, upon the territory of the Count of Toulouse, and the proposed journey to Palestine was delayed. War continued to rage between France and England, and with so little probability of a speedy termination, that many of the nobles, bound to the Crusade, left the two monarchs to settle the differences at their leisure, and proceeded to Palestine without them.

Death at last stepped in and removed Henry II. from the hostility of his foes, and the treachery and ingratitude of his children. His son Richard immediately concluded an alliance with Philip Augustus; and the two young, valiant, and impetuous monarchs united all their energies to forward the Crusade. They met with a numerous and brilliant retinue at Nonancourt in Normandy, where, in sight of their assembled chivalry, they embraced as brothers, and swore to live as friends and true allies, until a period of forty days after their return from the Holy Land. With a view of purging their camp from the follies and vices which had proved so ruinous to preceding expeditions, they drew up a code of laws for the government of the

army. Gambling had been carried to a great extent, and proved the fruitful source of quarrels and bloodshed; and one of their laws prohibited any person in the army, beneath the degree of a knight, from playing at any game for money.¹⁶ Knights and clergymen might play for money, but no one was permitted to lose or gain more than twenty shillings in a day, under a penalty of one hundred shillings. The personal attendants of the monarchs were also allowed to play to the same extent. The penalty in their case for infraction was that they should be whipped naked through the army for the space of three days. Any Crusader, who struck another and drew blood, was ordered to have his hand cut off; and whoever slew a brother Crusader was condemned to be tied alive to the corpse of his victim, and buried with him. No young women were allowed to follow the army, to the great sorrow of many vicious and of many virtuous dames, who had not courage to elude the decree by dressing in male attire. But many high-minded and affectionate maidens and matrons, bearing the sword or the spear, followed their husbands and lovers to the war in spite of King Richard, and in defiance of danger. The only women allowed to accompany the army in their own habiliments were washerwomen of fifty years complete, and any others of the fair sex who had reached the same age.

These rules having been promulgated, the two monarchs marched together to Lyons, where they separated, agreeing to meet again at Messina. Philip proceeded across the Alps to Genoa, where he took ship, and was conveyed in safety to the place of rendezvous. Richard turned in the direction of Marseilles, where he also took ship for Messina. His impetuous disposition hurried him into many squabbles by the way, and his knights and followers, for the most

part as brave and as foolish as himself, imitated him very zealously in this particular. At Messina the Sicilians charged the most exorbitant prices for every necessary of life. Richard's army in vain remonstrated. From words they came to blows, and, as a last resource, plundered the Sicilians, since they could not trade with them. Continual battles were the consequence, in one of which Lebrun, the favourite attendant of Richard, lost his life. The peasantry from far and near came flocking to the aid of the townspeople, and the battle soon became general. Richard, irritated at the loss of his favourite, and incited by report that Tancred, the king of Sicily, was fighting at the head of his own people, joined the *mêlée* with his boldest knights, and, beating back the Sicilians, attacked the city sword in hand, stormed the battlements, tore down the flag of Sicily, and planted his own in its stead. This collision gave great offence to the king of France, who became from that time jealous of Richard, and apprehensive that his design was not so much to re-establish the Christian kingdom of Jerusalem, as to make conquests for himself. He, however, exerted his influence to restore peace between the English and Sicilians, and shortly afterwards set sail for Acre, with distrust of his ally germinating in his heart.



THE ISLAND OF RHODES.

Richard remained behind for some weeks in a state of inactivity quite unaccountable in one of his temperaments. He appears to have had no more squabbles with the Sicilians, but to have lived an easy, luxurious life, forgetting, in the lap of pleasure, the objects for which he had quitted his own dominions and the dangerous laxity he was introducing into his army. The superstition of his soldiers recalled him at length to a sense of his duty: a comet was seen for several successive nights, which was thought to menace them with the vengeance of Heaven for their delay. Shooting stars gave them similar warning; and a fanatic, of the name of Joachim, with his drawn sword in his hand, and his long hair streaming wildly over his shoulders, went through the camp, howling all night long, and predicting plague, famine, and every other calamity, if they did not set out immediately. Richard did not deem it prudent to neglect the intimations; and, after doing humble penance for his remissness, he set sail for Acre.

A violent storm dispersed his fleet, but he arrived safely at Rhodes with the principal part of the armament. Here he learned that three of his ships had been stranded on the rocky coasts of Cyprus, and that the ruler of the island, Isaac Comnenus, had permitted his people to pillage the unfortunate crews, and had refused shelter to his betrothed bride, the Princess Berengaria, and his sister, who, in one of the vessels, had been driven by stress of weather into the port of Limisso. The fiery monarch swore to be revenged, and, collecting all his vessels, sailed back to Limisso. Isaac Comnenus refused to apologise or explain, and Richard, in no mood to be trifled with, landed on the island, routed with great loss the forces sent to oppose him, and laid the whole country under contribution.



RICHARD I. AND BERENGARIA.

On his arrival at Acre he found the whole of the chivalry of Europe there before him. Guy of Lusignan, the king of Jerusalem, had long before collected the bold Knights of the Temple, the Hospital, and St.

John, and had laid siege to Acre, which was resolutely defended by the Sultan Saladin, with an army magnificent both for its numbers and its discipline. For nearly two years the Crusaders had pushed the siege, and made efforts almost superhuman to dislodge the enemy. Various battles had taken place in the open fields with no decisive advantage to either party, and Guy of Lusignan had begun to despair of taking that strong position without aid from Europe. His joy was extreme on the arrival of Philip with all his chivalry, and he only awaited the coming of Cœur de Lion to make one last decisive attack upon the town. When the fleet of England was first seen approaching the shores of Syria, a universal shout arose from the Christian camp; and when Richard landed with his train, one louder still pierced to the very mountains of the south, where Saladin lay with all his army.

It may be remarked as characteristic of this Crusade, that the Christians and the Moslems no longer looked upon each other as barbarians, to whom mercy was a crime. Each host entertained the highest admiration for the bravery and magnanimity of the other, and, in their occasional truces, met upon the most friendly terms. The Moslem warriors were full of courtesy to the Christian knights, and had no other regret than to think that such fine fellows were not Mahomedans. The Christians, with a feeling precisely similar, extolled to the skies the nobleness of the Saracens, and sighed to think that such generosity and valour should be sullied by disbelief in the Gospel of Jesus. But when the strife began, all these feelings disappeared, and the struggle became mortal.

The jealousy excited in the mind of Philip by the events of Messina still rankled, and the two monarchs refused to act in concert. Instead of making a joint attack upon the town, the French monarch assailed

it alone, and was repulsed. Richard did the same, and with the same result. Philip tried to seduce the soldiers of Richard from their allegiance by the offer of three gold pieces per month to every knight who would forsake the banners of England for those of France. Richard endeavoured to neutralise the offer by a larger one, and promised four pieces to every French knight who should join the Lion of England. In this unworthy rivalry their time was wasted, to the great detriment of the discipline and efficiency of their followers. Some good was nevertheless effected; for the mere presence of two such armies prevented the besieged city from receiving supplies, and the inhabitants were reduced by famine to the most woful straits. Saladin did not deem it prudent to risk a general engagement by coming to their relief, but preferred to wait till dissension had weakened his enemy, and made him an easy prey. Perhaps if he had been aware of the real extent of the extremity in Acre, he would have changed his plan; but, cut off from the town, he did not know its misery till it was too late. After a short truce the city capitulated upon terms so severe that Saladin afterwards refused to ratify them. The chief conditions were, that the precious wood of the true cross, captured by the Moslems in Jerusalem, should be restored; that a sum of two hundred thousand gold pieces should be paid; and that all the Christian prisoners in Acre should be released, together with two hundred knights and a thousand soldiers detained in captivity by Saladin. The eastern monarch, as may be well conceived, did not set much store on the wood of the cross, but was nevertheless anxious to keep it, as he knew its possession by the Christians would do more than a victory to restore their courage. He refused, therefore, to deliver it up, or to accede to any of the conditions; and Richard, as he

had previously threatened, barbarously ordered all the Saracen prisoners in his power to be put to death.

The possession of the city only caused new and unhappy dissensions between the Christian leaders. The Archduke of Austria unjustifiably hoisted his flag on one of the towers of Acre, which Richard no sooner saw than he tore it down with his own hands, and trampled it under his feet. Philip, though he did not sympathise with the archduke, was piqued at the assumption of Richard, and the breach between the two monarchs became wider than ever. A foolish dispute arose at the same time between Guy of Lusignan and Conrad of Montferrat for the crown of Jerusalem. The inferior knights were not slow to imitate the pernicious example, and jealousy, distrust, and ill-will reigned in the Christian camp. In the midst of this confusion the king of France suddenly announced his intention to return to his own country. Richard was filled with indignation, and exclaimed, "Eternal shame light on him, and on all France, if, for any cause, he leave this work unfinished!" But Philip was not to be stayed. His health had suffered by his residence in the East; and, ambitious of playing a first part, he preferred to play none at all than to play second to King Richard. Leaving a small detachment of Burgundians behind, he returned to France with the remainder of his army; and Cœur de Lion, without feeling, in the multitude of his rivals, that he had lost the greatest, became painfully convinced that the right arm of the enterprise was lopped off.

After his departure, Richard re-fortified Acre, restored the Christian worship in the churches, and, leaving a Christian garrison to protect it, marched along the sea-coast towards Ascalon. Saladin was on the alert, and sent his light horse to attack the rear of the

Christian army, while he himself, miscalculating their weakness since the defection of Philip, endeavoured to force them to a general engagement. The rival armies met near Azotus. A fierce battle ensued, in which Saladin was defeated and put to flight, and the road to Jerusalem left free for the Crusaders.

Again discord exerted its baleful influence, and prevented Richard from following up his victory. His opinion was constantly opposed by the other leaders, all jealous of his bravery and influence; and the army, instead of marching to Jerusalem, or even to Ascalon, as was first intended, proceeded to Jaffa, and remained in idleness until Saladin was again in a condition to wage war against them.



BETHLEHEM.

Many months were spent in fruitless hostilities and as fruitless negotiations. Richard's wish was to recapture Jerusalem; but there were difficulties in the way, which even his bold spirit could not conquer. His own intolerable pride was not the least cause of the evil; for it estranged many a generous spirit, who would have been willing to co-operate with him in all cordiality. At length it was agreed to march to the Holy City; but the progress made was so slow and painful, that the soldiers murmured, and the leaders meditated

retreat. The weather was hot and dry, and there was little water to be procured. Saladin had choked up the wells and cisterns on the route, and the army had not zeal enough to push forward amid such privation. At Bethlehem a council was held, to debate whether they should retreat or advance. Retreat was decided upon, and immediately commenced. It is said, that Richard was first led to a hill, whence he could obtain a sight of the towers of Jerusalem, and that he was so affected at being so near it, and so unable to relieve it, that he hid his face behind his shield, and sobbed aloud.

The army separated into two divisions, the smaller falling back upon Jaffa, and the larger, commanded by Richard and the Duke of Burgundy, returning to Acre. Before the English monarch had made all his preparations for his return to Europe, a messenger reached Acre with the intelligence that Jaffa was besieged by Saladin, and that, unless relieved immediately, the city would be taken. The French, under the Duke of Burgundy, were so wearied with the war, that they refused to aid their brethren in Jaffa. Richard, blushing with shame at their pusillanimity, called his English to the rescue, and arrived just in time to save the city. His very name put the Saracens to flight, so great was their dread of his prowess. Saladin regarded him with the warmest admiration, and when Richard, after his victory, demanded peace, willingly acceded. A truce was concluded for three years and eight months, during which Christian pilgrims were to enjoy the liberty of visiting Jerusalem without hindrance or payment of any tax. The Crusaders were allowed to retain the cities of Tyre and Jaffa, with the country intervening. Saladin, with a princely generosity, invited many of the Christians to visit Jerusalem; and several of the leaders took advantage of his offer

to feast their eyes upon a spot which all considered so sacred. Many of them were entertained for days in the sultan's own palace, from which they returned with their tongues laden with the praises of the noble infidel. Richard and Saladin never met, though the impression that they did will remain on many minds, who have been dazzled by the glorious fiction of Sir Walter Scott. But each admired the prowess and nobleness of soul of his rival, and agreed to terms far less onerous than either would have accepted, had this mutual admiration not existed.¹⁷

The king of England no longer delayed his departure, for messengers from his own country brought imperative news that his presence was required to defeat the intrigues that were fomenting against his crown. His long imprisonment in the Austrian dominions and final ransom are too well known to be dwelt upon. And thus ended the third Crusade, less destructive of human life than the two first, but quite as useless.

The flame of popular enthusiasm now burned pale indeed, and all the efforts of popes and potentates were insufficient to rekindle it. At last, after flickering unsteadily, like a lamp expiring in the socket, it burned up brightly for one final instant, and was extinguished for ever.

The fourth Crusade, as connected with popular feeling, requires little or no notice. At the death of Saladin, which happened a year after the conclusion of his truce with Richard of England, his vast empire fell to pieces. His brother Saif Eddin, or Saphaddin, seized upon Syria, in the possession of which he was troubled by the sons of Saladin. When this intelligence reached Europe, the Pope, Celestine III., judged the moment favourable for preaching a new Crusade. But

every nation in Europe was unwilling and cold towards it. The people had no ardour, and kings were occupied with more weighty matters at home. The only monarch of Europe who encouraged it was the Emperor Henry of Germany, under whose auspices the Dukes of Saxony and Bavaria took the field at the head of a considerable force. They landed in Palestine, and found any thing but a welcome from the Christian inhabitants. Under the mild sway of Saladin, they had enjoyed repose and toleration, and both were endangered by the arrival of the Germans. They looked upon them in consequence as over-officious intruders, and gave them no encouragement in the warfare against Saphaddin. The result of this Crusade was even more disastrous than the last; for the Germans contrived not only to embitter the Saracens against the Christians of Judea, but to lose the strong city of Jaffa, and cause the destruction of nine-tenths of the army with which they had quitted Europe. And so ended the fourth Crusade.

The fifth was more important, and had a result which its projectors never dreamed of—no less than the sacking of Constantinople, and the placing of a French dynasty upon the imperial throne of the eastern Cæsars. Each succeeding pope, however much he may have differed from his predecessors on other points, zealously agreed in one, that of maintaining by every possible means the papal ascendancy. No scheme was so likely to aid in this endeavour as the Crusades. As long as they could persuade the kings and nobles of Europe to fight and die in Syria, their own sway was secured over the minds of men at home. Such being their object, they never inquired whether a Crusade was or was not likely to be successful, whether the time were well or ill chosen, or whether men and money could be

procured in sufficient abundance. Pope Innocent III. would have been proud if he could have bent the refractory monarchs of England and France into so much submission. But John and Philip Augustus were both engaged. Both had deeply offended the Church, and had been laid under her ban, and both were occupied in important reforms at home; Philip in bestowing immunities upon his subjects, and John in having them forced from him. The emissaries of the pope therefore plied them in vain; but as in the first and second Crusades, the eloquence of a powerful preacher incited the nobility, and through them a certain portion of the people; Foulque bishop of Neuilly, an ambitious and enterprising prelate, entered fully into the views of the court of Rome, and preached the Crusade wherever he could find an audience. Chance favoured him to a degree he did not himself expect, for he had in general found but few proselytes, and those few but cold in the cause. Theobald count of Champagne had instituted a grand tournament, to which he had invited all the nobles from far and near. Upwards of two thousand knights were present with their retainers, besides a vast concourse of people to witness the sports. In the midst of the festivities Foulque arrived upon the spot, and conceiving the opportunity to be a favourable one, he addressed the multitude in eloquent language, and passionately called upon them to enrol themselves for the new Crusade. The Count de Champagne, young, ardent, and easily excited, received the cross at his hands. The enthusiasm spread rapidly. Charles count of Blois followed the example, and of the two thousand knights present, scarcely one hundred and fifty refused. The popular phrensy seemed on the point of breaking out as in the days of yore. The Count of Flanders, the Count of Bar, the Duke of Burgundy, and the Marquis

of Montferrat, brought all their vassals to swell the train, and in a very short space of time an effective army was on foot and ready to march to Palestine.

The dangers of an overland journey were too well understood, and the Crusaders endeavoured to make a contract with some of the Italian states to convey them over in their vessels. Dandolo, the aged doge of Venice, offered them the galleys of the Republic; but the Crusaders, on their arrival in that city, found themselves too poor to pay even half the sum demanded. Every means was tried to raise money; the Crusaders melted down their plate, and ladies gave up their trinkets. Contributions were solicited from the faithful, but came in so slowly as to make it evident to all concerned, that the faithful of Europe were outnumbered by the prudent. As a last resource, Dandolo offered to convey them to Palestine at the expense of the Republic, if they would previously aid in the recapture of the city of Zara, which had been seized from the Venetians a short time previously by the king of Hungary. The Crusaders consented, much to the displeasure of the pope, who threatened excommunication upon all who should be turned aside from the voyage to Jerusalem. But notwithstanding the fulminations of the Church, the expedition never reached Palestine. The siege of Zara was speedily undertaken. After a long and brave defence, the city surrendered at discretion, and the Crusaders were free, if they had so chosen it, to use their swords against the Saracens. But the ambition of the chiefs had been directed, by unforeseen circumstances, elsewhere.

After the death of Manuel Comnenus, the Greek empire had fallen a prey to intestine divisions. His son Alexius II. had succeeded him, but was murdered after a short reign by his uncle Andronicus, who

seized upon the throne. His reign also was but of short duration. Isaac Angelus, a member of the same family, took up arms against the usurper, and having defeated and captured him in a pitched battle, had him put to death. He also mounted the throne only to be cast down from it. His brother Alexius deposed him, and to incapacitate him from reigning, put out his eyes, and shut him up in a dungeon. Neither was Alexius III. allowed to remain in peaceable possession of the throne; the son of the unhappy Isaac, whose name also was Alexius, fled from Constantinople, and hearing that the Crusaders had undertaken the siege of Zara, made them the most magnificent offers if they would afterwards aid him in deposing his uncle. His offers were, that if by their means he was re-established in his father's dominions, he would place the Greek Church under the authority of the Pope of Rome, lend the whole force of the Greek empire to the conquest of Palestine, and distribute two hundred thousand marks of silver among the crusading army. The offer was accepted, with a proviso on the part of some of the leaders, that they should be free to abandon the design, if it met with the disapproval of the pope. But this was not to be feared. The submission of the schismatic Greeks to the See of Rome was a greater bribe to the Pontiff than the utter annihilation of the Saracen power in Palestine would have been.

The Crusaders were soon in movement for the imperial city. Their operations were skilfully and courageously directed, and spread such dismay as to paralyse the efforts of the usurper to retain possession of his throne. After a vain resistance, he abandoned the city to its fate, and fled no one knew whither. The aged and blind Isaac was taken from his dungeon by his subjects, and placed upon the throne

ere the Crusaders were apprised of the flight of his rival. His son Alexius IV. was afterwards associated with him in the sovereignty.

But the conditions of the treaty gave offence to the Grecian people, whose prelates refused to place themselves under the dominion of the See of Rome. Alexius at first endeavoured to persuade his subjects to admission, and prayed the Crusaders to remain in Constantinople until they had fortified him in the possession of a throne which was yet far from secure. He soon became unpopular with his subjects; and breaking faith with regard to the subsidies, he offended the Crusaders. War was at length declared upon him by both parties; by his people for his tyranny, and by his former friends for his treachery. He was seized in his palace by his own guards and thrown into prison, while the Crusaders were making ready to besiege his capital. The Greeks immediately proceeded to the election of a new monarch; and looking about for a man of courage, energy, and perseverance, they fixed upon Alexius Ducas, who, with almost every bad quality, was possessed of the virtues they needed. He ascended the throne under the name of Murzuphlis. One of his first acts was to rid himself of his youngest predecessor—a broken heart had already removed the blind old Isaac, no longer a stumbling-block in his way—and the young Alexius was soon after put to death in his prison.



CONSTANTINOPLE.

War to the knife was now declared between the Greeks and the Franks; and early in the spring of the year 1204, preparations were commenced for an assault upon Constantinople. The French and Venetians entered into a treaty for the division of the spoils among their soldiery; for so confident were they of success, that failure never once entered into their calculations. This confidence led them on to victory; while the Greeks, cowardly as treacherous people always are, were paralysed by a foreboding of evil. It has been a matter of astonishment to all historians, that Murzuphlis, with the reputation for courage which he had acquired, and the immense resources at his disposal, took no better measures to repel the onset of the Crusaders. Their numbers were as a mere handful in comparison with those which he could have brought against them; and if they had the hopes of plunder to lead them on, the Greeks had their homes to fight for, and their very existence as a nation to protect. After an impetuous assault, repulsed for one day, but renewed with double impetuosity on another, the Crusaders lashed their vessels against the walls, slew every man who opposed them, and, with little loss to themselves, entered the city. Murzuphlis fled, and Constantinople was given over to be pillaged by the victors. The wealth they found was enormous. In money alone there was sufficient to distribute twenty marks of silver to each knight, ten to each squire or servant at arms, and five to each archer. Jewels, velvets, silks, and every luxury of attire, with rare wines and fruits, and valuable merchandise of every description, also fell into their hands, and were bought by the trading Venetians, and the proceeds distributed among the army. Two thousand persons were put to the

sword; but had there been less plunder to take up the attention of the victors, the slaughter would in all probability have been much greater.

In many of the bloody wars which defile the page of history, we find that soldiers, utterly reckless of the works of God, will destroy his masterpiece, man, with unsparing brutality, but linger with respect round the beautiful works of art. They will slaughter women and children, but spare a picture; will hew down the sick, the helpless, and the hoary-headed, but refrain from injuring a fine piece of sculpture. The Latins, on their entrance into Constantinople, respected neither the works of God nor man, but vented their brutal ferocity upon the one, and satisfied their avarice upon the other. Many beautiful bronze statues, above all price as works of art, were broken into pieces to be sold as old metal. The finely-chiselled marble, which could be put to no such vile uses, was also destroyed with a recklessness, if possible, still more atrocious.¹⁸

The carnage being over, and the spoil distributed, six persons were chosen from among the Franks and six from among the Venetians, who were to meet and elect an emperor, previously binding themselves by oath to select the individual best qualified among the candidates. The choice wavered between Baldwin count of Flanders and Boniface marquis of Montferrat, but fell eventually upon the former. He was straightway robed in the imperial purple, and became the founder of a new dynasty. He did not live long to enjoy his power, or to consolidate it for his successors, who, in their turn, were soon swept away. In less than sixty years the rule of the Franks at Constantinople was brought to as sudden and disastrous a

termination as the reign of Murzuphlis: and this was the grand result of the fifth Crusade.

Pope Innocent III., although he had looked with no very unfavourable eye upon these proceedings, regretted that nothing had been done for the relief of the Holy Land; still, upon every convenient occasion, he enforced the necessity of a new Crusade. Until the year 1213, his exhortations had no other effect than to keep the subject in the mind of Europe. Every spring and summer detachments of pilgrims continued to set out for Palestine to the aid of their brethren, but not in sufficient numbers to be of much service. These periodical passages were called the *passagium Martii*, or the passage of March, and the *passagium Johannis*, or the passage of the festival of St. John. These did not consist entirely of soldiers, armed against the Saracen, but of pilgrims led by devotion, and in performance of their vows, bearing nothing with them but their staff and their wallet. Early in the spring of 1213 a more extraordinary body of Crusaders was raised in France and Germany. An immense number of boys and girls, amounting, according to some accounts, to thirty thousand, were incited by the persuasion of two monks to undertake the journey to Palestine. They were no doubt composed of the idle and deserted children who generally swarm in great cities, nurtured in vice and daring, and ready for any thing. The object of the monks seems to have been the atrocious one of inveigling them into slave-ships, on pretence of sending them to Syria, and selling them for slaves on the coast of Africa.¹⁹ Great numbers of these poor victims were shipped at Marseilles; but the vessels, with the exception of two or three, were wrecked on the shores of Italy, and every soul perished. The remainder arrived safely in Africa, and were

bought up as slaves, and sent off into the interior of the country. Another detachment arrived at Genoa; but the accomplices in this horrid plot having taken no measures at that port, expecting them all at Marseilles, they were induced to return to their homes by the Genoese.

Fuller, in his quaint history of the *Holy Warre*, says that this Crusade was done by the instinct of the devil; and he adds a reason, which may provoke mirth now, but which was put forth by the worthy historian in all soberness and sincerity. He says, “the devil, being cloyed with the murdering of men, desired a cordial of children’s blood to comfort his weak stomach;” as epicures, when tired of mutton, resort to lamb for a change.

It appears from other authors that the preaching of the vile monks had such an effect upon these deluded children that they ran about the country, exclaiming, “O Lord Jesus, restore thy cross to us!” and that neither bolts nor bars, the fear of fathers, nor the love of mothers, was sufficient to restrain them from journeying to Jerusalem.

The details of these strange proceedings are exceedingly meagre and confused, and none of the contemporary writers who mention the subject have thought it worth while to state the names of the monks who originated the scheme, or the fate they met for their wickedness. Two merchants of Marseilles, who were to have shared in the profits, were, it is said, brought to justice for some other crime, and suffered death; but we are not informed whether they divulged any circumstances relating to this matter.

Pope Innocent III. does not seem to have been aware that the causes of this juvenile Crusade were such as have been stated, for,

upon being informed that numbers of them had taken the cross, and were marching to the Holy Land, he exclaimed, "These children are awake while we sleep!" He imagined, apparently, that the mind of Europe was still bent on the recovery of Palestine, and that the zeal of these children implied a sort of reproach upon his own lukewarmness. Very soon afterwards, he bestirred himself with more activity, and sent an encyclical letter to the clergy of Christendom, urging them to preach a new Crusade. As usual, a number of adventurous nobles, who had nothing else to do, enrolled themselves with their retainers. At a Council of Lateran, which was held while these bands were collecting, Innocent announced that he himself would take the Cross, and lead the armies of Christ to the defence of his sepulchre. In all probability he would have done so, for he was zealous enough; but death stepped in, and destroyed his project ere it was ripe. His successor encouraged the Crusade, though he refused to accompany it; and the armament continued in France, England, and Germany. No leaders of any importance joined it from the former countries. Andrew king of Hungary was the only monarch who had leisure or inclination to leave his dominions. The Dukes of Austria and Bavaria joined him with a considerable army of Germans, and marching to Spalatro, took ship for Cyprus, and from thence to Acre.

The whole conduct of the king of Hungary was marked by pusillanimity and irresolution. He found himself in the Holy Land at the head of a very efficient army; the Saracens were taken by surprise, and were for some weeks unprepared to offer any resistance to his arms. He defeated the first body sent to oppose him, and marched towards Mount Tabor with the intention of seizing upon an

important fortress which the Saracens had recently constructed. He arrived without impediment at the mount, and might have easily taken it; but a sudden fit of cowardice came over him, and he returned to Acre without striking a blow. He very soon afterwards abandoned the enterprise altogether, and returned to his own country.

Tardy reinforcements arrived at intervals from Europe; and the Duke of Austria, now the chief leader of the expedition, had still sufficient forces at his command to trouble the Saracens very seriously. It was resolved by him, in council with the other chiefs, that the whole energy of the Crusade should be directed upon Egypt, the seat of the Saracen power in its relationship to Palestine, and from whence were drawn the continual levies that were brought against them by the sultan. Damietta, which commanded the river Nile, and was one of the most important cities of Egypt, was chosen as the first point of attack. The siege was forthwith commenced, and carried on with considerable energy, until the Crusaders gained possession of a tower, which projected into the middle of the stream, and was looked upon as the very key of the city.

While congratulating themselves upon this success, and wasting in revelry the time which should have been employed in turning it to further advantage, they received the news of the death of the wise Sultan Saphaddin. His two sons, Camhel and Cohreddin, divided his empire between them. Syria and Palestine fell to the share of Cohreddin, while Egypt was consigned to the other brother, who had for some time exercised the functions of lieutenant of that country. Being unpopular among the Egyptians, they revolted against him, giving the Crusaders a finer opportunity for making a conquest than

they had ever enjoyed before. But, quarrelsome and licentious as they had been from time immemorial, they did not see that the favourable moment had come; or seeing, could not profit by it. While they were revelling or fighting among themselves, under the walls of Damietta, the revolt was suppressed, and Camhel firmly established on the throne of Egypt. In conjunction with his brother Cohreddin, his next care was to drive the Christians from Damietta, and for upwards of three months they bent all their efforts to throw in supplies to the besieged, or draw on the besiegers to a general engagement. In neither were they successful; and the famine in Damietta became so dreadful that vermin of every description were thought luxuries, and sold for exorbitant prices. A dead dog became more valuable than a live ox in time of prosperity. Unwholesome food brought on disease, and the city could hold out no longer for absolute want of men to defend the walls.

Cohreddin and Camhel were alike interested in the preservation of so important a position, and, convinced of the certain fate of the city, they opened a conference with the crusading chiefs, offering to yield the whole of Palestine to the Christians upon the sole condition of the evacuation of Egypt. With a blindness and wrong-headedness almost incredible, these advantageous terms were refused, chiefly through the persuasion of Cardinal Pelagius, an ignorant and obstinate fanatic, who urged upon the Duke of Austria and the French and English leaders, that infidels never kept their word; that their offers were deceptive, and merely intended to betray. The conferences were brought to an abrupt termination by the Crusaders, and a last attack made upon the walls of Damietta. The besieged made but slight resistance, for they had no hope, and the Christians

entered the city, and found, out of seventy thousand people, but three thousand remaining: so fearful had been the ravages of the twin fiends, plague and famine.

Several months were spent in Damietta. The climate either weakened the frames or obscured the understandings of the Christians; for, after their conquest, they lost all energy, and abandoned themselves more unscrupulously than ever to riot and debauchery. John of Brienne, who, by right of his wife, was the nominal sovereign of Jerusalem, was so disgusted with the pusillanimity, arrogance, and dissensions of the chiefs, that he withdrew entirely from them and retired to Acre. Large bodies also returned to Europe, and Cardinal Pelagius was left at liberty to blast the whole enterprise whenever it pleased him. He managed to conciliate John of Brienne, and marched forward with these combined forces to attack Cairo. It was only when he had approached within a few hours' march of that city that he discovered the inadequacy of his army. He turned back immediately; but the Nile had risen since his departure; the sluices were opened, and there was no means of reaching Damietta. In this strait, he sued for the peace he had formerly spurned, and, happily for himself, found the generous brothers Camhel and Cohreddin still willing to grant it. Damietta was soon afterwards given up, and the cardinal returned to Europe. John of Brienne retired to Acre, to mourn the loss of his kingdom, embittered against the folly of his pretended friends, who had ruined where they should have aided him. And thus ended the sixth Crusade.

The seventh was more successful. Frederic II., emperor of Germany, had often vowed to lead his armies to the defence of

Palestine, but was as often deterred from the journey by matters of more pressing importance. Cohreddin was a mild and enlightened monarch, and the Christians of Syria enjoyed repose and toleration under his rule: but John of Brienne was not willing to lose his kingdom without an effort; and the popes in Europe were ever willing to embroil the nations for the sake of extending their own power. No monarch of that age was capable of rendering more effective assistance than Frederic of Germany. To inspire him with more zeal, it was proposed that he should wed the young Princess Violante, daughter of John of Brienne, and heiress of the kingdom of Jerusalem. Frederic consented with joy and eagerness. The princess was brought from Acre to Rome without delay, and her marriage celebrated on a scale of great magnificence. Her father, John of Brienne, abdicated all his rights in favour of his son-in-law, and Jerusalem had once more a king, who had not only the will, but the power, to enforce his claims. Preparations for the new Crusade were immediately commenced, and in the course of six months the emperor was at the head of a well-disciplined army of sixty thousand men. Matthew Paris informs us, that an army of the same amount was gathered in England; and most of the writers upon the Crusades adopt his statement. When John of Brienne was in England, before his daughter's marriage with the emperor was thought of, praying for the aid of Henry III. and his nobles to recover his lost kingdom, he did not meet with much encouragement. Grafton, in his *Chronicle*, says, "he departed again without any great comfort." But when a man of more influence in European politics appeared upon the scene, the English nobles were as ready to sacrifice themselves in the cause as they had been in the time of Cœur de Lion.

The army of Frederic encamped at Brundisium; but a pestilential disease having made its appearance among them, their departure was delayed for several months. In the mean time the Empress Violante died in childbed. John of Brienne, who had already repented of his abdication, and was besides incensed against Frederic for many acts of neglect and insult, no sooner saw the only tie which bound them severed by the death of his daughter, than he began to bestir himself, and make interest with the pope to undo what he had done, and regain the honorary crown he had renounced. Pope Gregory IX., a man of a proud, unconciliating, and revengeful character, owed the emperor a grudge for many an act of disobedience to his authority, and encouraged the overtures of John of Brienne more than he should have done. Frederic, however, despised them both, and, as soon as his army was convalescent, set sail for Acre. He had not been many days at sea when he was himself attacked with the malady, and obliged to return to Otranto, the nearest port. Gregory, who had by this time decided in the interest of John of Brienne, excommunicated the emperor for returning from so holy an expedition on any pretext whatever. Frederic at first treated the excommunication with supreme contempt; but when he got well, he gave his holiness to understand that he was not to be outraged with impunity, and sent some of his troops to ravage the papal territories. This, however, only made the matter worse, and Gregory despatched messengers to Palestine forbidding the faithful, under severe pains and penalties, to hold any intercourse with the excommunicated emperor. Thus between them both, the scheme which they had so much at heart bade fair to be as effectually ruined as even the Saracens could have wished. Frederic still continued his

zeal in the Crusade, for he was now king of Jerusalem, and fought for himself, and not for Christendom, or its representative, Pope Gregory. Hearing that John of Brienne was preparing to leave Europe, he lost no time in taking his own departure, and arrived safely at Acre. It was here that he first experienced the evil effects of excommunication. The Christians of Palestine refused to aid him in any way, and looked with distrust, if not with abhorrence, upon him. The Templars, Hospitallers, and other knights, shared at first the general feeling; but they were not men to yield a blind obedience to a distant potentate, especially when it compromised their own interests. When, therefore, Frederic prepared to march upon Jerusalem without them, they joined his banners to a man.



TEMPLAR AND HOSPITALLER.

It is said that, previous to quitting Europe, the German emperor had commenced a negotiation with the Sultan Camhel for the restoration of the Holy Land, and that Camhel, who was jealous of the ambition of his brother Cohreddin, was willing to stipulate to that effect, on condition of being secured by Frederic in the possession of the more important territory of Egypt. But before the Crusaders reached Palestine, Camhel was relieved from all fears by the death of his brother. He nevertheless did not think it worth while to contest with the Crusaders the barren corner of the earth which had already been dyed with so much Christian and Saracen blood, and proposed a truce of three years, only stipulating, in addition, that the Moslems should be allowed to worship freely in the temple

of Jerusalem. This happy termination did not satisfy the bigoted Christians of Palestine. The tolerance they sought for themselves, they were not willing to extend to others, and they complained bitterly of the privilege of free worship allowed to their opponents. Unmerited good fortune had made them insolent, and they contested the right of the emperor to become a party to any treaty, as long as he remained under the ecclesiastical ban. Frederic was disgusted with his new subjects; but, as the Templars and Hospitallers remained true to him, he marched to Jerusalem to be crowned. All the churches were shut against him, and he could not even find a priest to officiate at his coronation. He had despised the papal authority too long to quail at it now, when it was so unjustifiably exerted, and, as there was nobody to crown him, he very wisely crowned himself. He took the royal diadem from the altar with his own hands, and boldly and proudly placed it on his brow. No shouts of an applauding populace made the welkin ring; no hymns of praise and triumph resounded from the ministers of religion; but a thousand swords started from their scabbards to testify that their owners would defend the new monarch to the death.

It was hardly to be expected that he would renounce for any long period the dominion of his native land for the uneasy crown and barren soil of Palestine. He had seen quite enough of his new subjects before he was six months among them, and more important interests called him home. John of Brienne, openly leagued with Pope Gregory against him, was actually employed in ravaging his territories at the head of a papal army. This intelligence decided his return. As a preliminary step, he made those who had contemned his authority feel, to their sorrow, that he was their master. He then set

sail, loaded with the curses of Palestine. And thus ended the seventh Crusade, which, in spite of every obstacle and disadvantage, had been productive of more real service to the Holy Land than any that had gone before; a result solely attributable to the bravery of Frederic and the generosity of the Sultan Camhel.

Soon after the emperor's departure a new claimant started for the throne of Jerusalem, in the person of Alice queen of Cyprus, and half-sister of the Mary who, by her marriage, had transferred her right to John of Brienne. The grand military orders, however, clung to Frederic, and Alice was obliged to withdraw.

So peaceful a termination to the Crusade did not give unmixed pleasure in Europe. The chivalry of France and England were unable to rest, and long before the conclusion of the truce, were collecting their armies for an eighth expedition. In Palestine also the contentment was far from universal. Many petty Mahomedan states in the immediate vicinity were not parties to the truce, and harassed the frontier towns incessantly. The Templars, ever turbulent, waged bitter war with the sultan of Aleppo, and in the end were almost exterminated. So great was the slaughter among them that Europe resounded with the sad story of their fate, and many a noble knight took arms to prevent the total destruction of an order associated with so many high and inspiring remembrances. Camhel, seeing the preparations that were making, thought that his generosity had been sufficiently shewn, and the very day the truce was at an end assumed the offensive, and marching forward to Jerusalem, took possession of it, after routing the scanty forces of the Christians. Before this intelligence reached Europe a large body of Crusaders was on the march, headed by the king of Navarre, the Duke of Burgundy, the

Count de Bretagne, and other leaders. On their arrival, they learned that Jerusalem had been taken, but that the sultan was dead, and his kingdom torn by rival claimants to the supreme power. The dissensions of their foes ought to have made them united, but as in all previous Crusades, each feudal chief was master of his own host, and acted upon his own responsibility, and without reference to any general plan. The consequence was that nothing could be done. A temporary advantage was gained by one leader, who had no means of improving it; while another was defeated, without means of retrieving himself. Thus the war lingered till the battle of Gaza, when the king of Navarre was defeated with great loss, and compelled to save himself from total destruction by entering into a hard and oppressive treaty with the emir of Karac.

At this crisis aid arrived from England, commanded by Richard earl of Cornwall, the namesake of Cœur de Lion, and inheritor of his valour. His army was strong and full of hope. They had confidence in themselves and in their leader, and looked like men accustomed to victory. Their coming changed the aspect of affairs. The new sultan of Egypt was at war with the sultan of Damascus, and had not forces to oppose two enemies so powerful. He therefore sent messengers to meet the English earl, offering an exchange of prisoners and the complete cession of the Holy Land. Richard, who had not come to fight for the mere sake of fighting, agreed at once to terms so advantageous, and became the deliverer of Palestine without striking a blow. The sultan of Egypt then turned his whole force against his Moslem enemies, and the Earl of Cornwall returned to Europe. Thus ended the eighth Crusade, the most beneficial of all. Christendom had no further pretence for sending her fierce levies to the East. To

all appearance the holy wars were at an end: the Christians had entire possession of Jerusalem, Tripoli, Antioch, Edessa, Acre, Jaffa, and, in fact, of nearly all Judea; and, could they have been at peace among themselves, they might have overcome, without great difficulty, the jealousy and hostility of their neighbours. A circumstance, as unforeseen as it was disastrous, blasted this fair prospect, and reillumed, for the last time, the fervour and fury of the Crusades.

Gengis Khan and his successors had swept over Asia like a tropical storm, overturning in their progress the landmarks of ages. Kingdom after kingdom was cast down as they issued, innumerable, from the far recesses of the North and East, and, among others, the empire of Korasmin was overrun by these all-conquering hordes. The Korasmins, a fierce, uncivilised race, thus driven from their homes, spread themselves, in their turn, over the south of Asia with fire and sword, in search of a resting-place. In their impetuous course they directed themselves towards Egypt, whose sultan, unable to withstand the swarm that had cast their longing eyes on the fertile valleys of the Nile, endeavoured to turn them from their course. For this purpose, he sent emissaries to Barbaquan, their leader, inviting them to settle in Palestine; and the offer being accepted by the wild horde, they entered the country before the Christians received the slightest intimation of their coming. It was as sudden as it was overwhelming. Onwards, like the simoom, they came, burning and slaying, and were at the walls of Jerusalem before the inhabitants had time to look round them. They spared neither life nor property; they slew women and children, and priests at the altar, and profaned even the graves of those who had slept for ages. They tore down

every vestige of the Christian faith, and committed horrors unparalleled in the history of warfare. About seven thousand of the inhabitants of Jerusalem sought safety in retreat; but before they were out of sight, the banner of the cross was hoisted upon the walls by the savage foe to decoy them back. The artifice was but too successful. The poor fugitives imagined that help had arrived from another direction, and turned back to regain their homes. Nearly the whole of them were massacred, and the streets of Jerusalem ran with blood.



JAFFA.

The Templars, Hospitallers, and Teutonic knights forgot their long and bitter animosities, and joined hand in hand to rout out this desolating foe. They entrenched themselves in Jaffa with all the chivalry of Palestine that yet remained, and endeavoured to engage the sultans of Emissa and Damascus to assist them against the common enemy. The aid obtained from the Moslems amounted at first to only four thousand men, but with these reinforcements Walter of Brienne, the lord of Jaffa, resolved to give battle to the Korasmins. The conflict was as deadly as despair on the one side, and unmitigated ferocity on the other, could make it. It lasted with

varying fortune for two days, when the sultan of Emissa fled to his fortifications, and Walter of Brienne fell into the enemy's hands. The brave knight was suspended by the arms to a cross in sight of the walls of Jaffa, and the Korasminian leader declared that he should remain in that position until the city surrendered. Walter raised his feeble voice, not to advise surrender, but to command his soldiers to hold out to the last. But his gallantry was unavailing. So great had been the slaughter, that out of the grand array of knights, there now remained but sixteen Hospitallers, thirty-three Templars, and three Teutonic cavaliers. These with the sad remnant of the army fled to Acre, and the Korasmins were masters of Palestine.

The sultans of Syria preferred the Christians to this fierce horde for their neighbours. Even the sultan of Egypt began to regret the aid he had given to such barbarous foes, and united with those of Emissa and Damascus to root them from the land. The Korasmins amounted to but twenty thousand men, and were unable to resist the determined hostility which encompassed them on every side. The sultans defeated them in several engagements, and the peasantry rose up in masses to take vengeance upon them. Gradually their numbers were diminished. No mercy was shewn them in defeat. Barbaquan their leader was slain; and after five years of desperate struggles, they were finally extirpated, and Palestine became once more the territory of the Mussulmans.



WILLIAM LONGSWORD.

A short time previous to this devastating eruption, Louis IX. fell sick in Paris, and dreamed in the delirium of his fever that he saw the Christian and Moslem host fighting before Jerusalem, and the Christians defeated with great slaughter. The dream made a great impression on his superstitious mind, and he made a solemn vow, that if ever he recovered his health, he would take a pilgrimage to the Holy Land. When the news of the misfortunes of Palestine, and the awful massacres at Jerusalem and Jaffa, arrived in Europe, St. Louis remembered him of his dream. More persuaded than ever that it was an intimation direct from heaven, he prepared to take the cross at the head of his armies, and march to the deliverance of the Holy Sepulchre. From that moment he doffed the royal mantle of purple and ermine, and dressed in the sober serge becoming a pilgrim. All his thoughts were directed to the fulfilment of his design, and although his kingdom could but ill spare him, he made every preparation to leave it. Pope Innocent IV. applauded his zeal and afforded him every assistance. He wrote to Henry III. of England to forward the cause in his dominions, and called upon the clergy and

laity all over Europe to contribute towards it. William Longsword, the celebrated Earl of Salisbury, took the cross at the head of a great number of valiant knights and soldiers. But the fanaticism of the people was not to be awakened either in France or England. Great armies were raised, but the masses no longer sympathised. Taxation had been the great cooler of zeal. It was no longer a disgrace even to a knight if he refused to take the cross. Rutebeuf, a French minstrel, who flourished about this time (1250), composed a dialogue between a Crusader and a non-Crusader, which the reader will find translated in *Way's Fabliaux*. The Crusader uses every argument to persuade the non-Crusader to take up arms, and forsake every thing, in the holy cause; but it is evident from the greater force of the arguments used by the non-Crusader, that he was the favourite of the minstrel. To a most urgent solicitation of his friend the Crusader, he replies:

“I read thee right, thou holdest good
To this same land I straight should hie,
And win it back with mickle blood,
Nor gaine one foot of soil thereby;
While here dejected and forlorn
My wife and babes are left to mourn;
My goodly mansion rudely marred,
All trusted to my dogs to guard.
But I, fair comrade, well I wot
An ancient saw of pregnant wit
Doth bid us keep what we have got;
And troth I mean to follow it.”

This being the general feeling, it is not to be wondered at that Louis IX. was occupied fully three years in organising his forces, and in making the necessary preparations for his departure. When all was ready he set sail for Cyprus, accompanied by his queen, his two brothers, the Counts d'Anjou and d'Artois, and a long train of the noblest chivalry of France. His third brother, the Count de Poitiers, remained behind to collect another corps of Crusaders, and followed him in a few months afterwards. The army united at Cyprus, and amounted to fifty thousand men, exclusive of the English Crusaders under William Longsword. Again, a pestilential disease made its appearance, to which many hundreds fell victims. It was in consequence found necessary to remain in Cyprus until the spring. Louis then embarked for Egypt with his whole host; but a violent tempest separated his fleet, and he arrived before Damietta with only a few thousand men. They were, however, impetuous and full of hope; and although the Sultan Melick Shah was drawn up on the shore with a force infinitely superior, it was resolved to attempt a landing without waiting the arrival of the rest of the army. Louis himself, in wild impatience, sprang from his boat, and waded on shore; while his army, inspired by his enthusiastic bravery, followed, shouting the old war-cry of the first Crusaders, *Dieu le veut! Dieu le veut!* A panic seized the Turks. A body of their cavalry attempted to bear down upon the Crusaders, but the knights fixed their large shields deep in the sands of the shore, and rested their lances upon them, so that they projected above, and formed a barrier so imposing, that the Turks, afraid to breast it, turned round and fairly took to flight. At the moment of this panic, a false report was spread in the Saracen host, that the sultan had been slain. The confusion

immediately became general—the *deroute* was complete: Damietta itself was abandoned, and the same night the victorious Crusaders fixed their head-quarters in that city. The soldiers who had been separated from their chief by the tempest arrived shortly afterwards; and Louis was in a position to justify the hope, not only of the conquest of Palestine, but of Egypt itself.

But too much confidence proved the bane of his army. They thought, as they had accomplished so much, that nothing more remained to be done, and gave themselves up to ease and luxury. When, by the command of Louis, they marched towards Cairo, they were no longer the same men; success, instead of inspiring, had unnerved them; debauchery had brought on disease, and disease was aggravated by the heat of a climate to which none of them were accustomed. Their progress towards Massoura, on the road to Cairo, was checked by the Thanisian canal, on the banks of which the Saracens were drawn up to dispute the passage. Louis gave orders that a bridge should be thrown across: and the operations commenced under cover of two cat-castles, or high movable towers. The Saracens soon destroyed them by throwing quantities of Greek fire, the artillery of that day, upon them, and Louis was forced to think of some other means of effecting his design. A peasant agreed, for a considerable bribe, to point out a ford where the army might wade across, and the Count d'Artois was despatched with fourteen hundred men to attempt it, while Louis remained to face the Saracens with the main body of the army. The Count d'Artois got safely over, and defeated the detachment that had been sent to oppose his landing. Flushed with the victory, the brave count forgot the inferiority of his numbers, and pursued the panic-stricken enemy

into Massoura. He was now completely cut off from the aid of his brother Crusaders, which the Moslems perceiving, took courage and returned upon him, with a force swollen by the garrison of Massoura, and by reinforcements from the surrounding districts. The battle now became hand to hand. The Christians fought with the energy of desperate men, but the continually increasing numbers of the foe surrounded them completely, and cut off all hope, either of victory or escape. The Count d'Artois was among the foremost of the slain; and when Louis arrived to the rescue, the brave advanced-guard was nearly cut to pieces. Of the fourteen hundred but three hundred remained. The fury of the battle was now increased threefold. The French king and his troops performed prodigies of valour, and the Saracens, under the command of the Emir Ceccidun, fought as if they were determined to exterminate, in one last decisive effort, the new European swarm that had settled upon their coast. At the fall of the evening dews the Christians were masters of the field of Massoura, and flattered themselves that they were the victors. Self-love would not suffer them to confess that the Saracens had withdrawn, and not retreated; but their leaders were too wofully convinced that that fatal field had completed the disorganisation of the Christian army, and that all hopes of future conquest were at an end.

Impressed with this truth, the Crusaders sued for peace. The sultan insisted upon the immediate evacuation of Damietta, and that Louis himself should be delivered as hostage for the fulfilment of the condition. His army at once refused, and the negotiations were broken off. It was now resolved to attempt a retreat; but the agile Saracens, now in the front and now in the rear, rendered it a matter of extreme difficulty, and cut off the stragglers in great numbers.

Hundreds of them were drowned in the Nile; and sickness and famine worked sad ravages upon those who escaped all other casualties. Louis himself was so weakened by disease, fatigue, and discouragement, that he was hardly able to sit upon his horse. In the confusion of the flight he was separated from his attendants, and left a total stranger upon the sands of Egypt, sick, weary, and almost friendless. One knight, Geffry de Sergines, alone attended him, and led him to a miserable hut in a small village, where for several days he lay in the hourly expectation of death. He was at last discovered and taken prisoner by the Saracens, who treated him with all the honour due to his rank and all the pity due to his misfortunes. Under their care his health rapidly improved, and the next consideration was that of his ransom.

The Saracens demanded, besides money, the cession of Acre, Tripoli, and other cities of Palestine. Louis unhesitatingly refused, and conducted himself with so much pride and courage that the sultan declared he was the proudest infidel he had ever beheld. After a good deal of haggling, the sultan agreed to waive these conditions, and a treaty was finally concluded. The city of Damietta was restored; a truce of ten years agreed upon, and ten thousand golden bezants paid for the release of Louis and the liberation of all the captives. Louis then withdrew to Jaffa, and spent two years in putting that city, and Cesarea, with the other possessions of the Christians in Palestine, into a proper state of defence. He then returned to his own country, with great reputation as a saint, but very little as a soldier.

Matthew Paris informs us that, in the year 1250, while Louis was in Egypt, “thousands of the English were resolved to go to the holy

war, had not the king strictly guarded his ports and kept his people from running out of doors.” When the news arrived of the reverses and captivity of the French king, their ardour cooled; and the Crusade was sung of only, but not spoken of.

In France, a very different feeling was the result. The news of the king’s capture spread consternation through the country. A fanatic monk of Citeaux suddenly appeared in the villages, preaching to the people, and announcing that the Holy Virgin, accompanied by a whole army of saints and martyrs, had appeared to him, and commanded him to stir up the shepherds and farm-labourers to the defence of the cross. To them only was his discourse addressed; and his eloquence was such, that thousands flocked around him, ready to follow wherever he should lead. The pastures and the corn-fields were deserted, and the shepherds, or *pastoureaux*, as they were termed, became at last so numerous as to amount to upwards of fifty thousand,—Milot says one hundred thousand men.²⁰ The Queen Blanche, who governed as regent during the absence of the king, encouraged at first the armies of the *pastoureaux*; but they soon gave way to such vile excesses that the peaceably disposed were driven to resistance. Robbery, murder, and violation marked their path; and all good men, assisted by the government, united in putting them down. They were finally dispersed, but not before three thousand of them had been massacred. Many authors say that the slaughter was still greater.

The ten years’ truce concluded in 1264, and St. Louis was urged by two powerful motives to undertake a second expedition for the relief of Palestine. These were, fanaticism on the one hand, and a desire of retrieving his military fame on the other, which had suffered more

than his parasites liked to remind him of. The pope, of course, encouraged his design, and once more the chivalry of Europe began to bestir themselves. In 1268, Edward, the heir of the English monarchy, announced his determination to join the Crusade; and the pope (Clement IV.) wrote to the prelates and clergy to aid the cause by their persuasions and their revenues. In England, they agreed to contribute a tenth of their possessions; and by a parliamentary order, a twentieth was taken from the corn and movables of all the laity at Michaelmas.

In spite of the remonstrances of the few clear-headed statesmen who surrounded him, urging the ruin that might in consequence fall upon his then prosperous kingdom, Louis made every preparation for his departure. The warlike nobility were nothing loath; and in the spring of 1270, the king set sail with an army of sixty thousand men. He was driven by stress of weather into Sardinia, and while there, a change in his plans took place. Instead of proceeding to Acre, as he originally intended, he shaped his course for Tunis, on the African coast. The king of Tunis had some time previously expressed himself favourably disposed towards the Christians and their religion, and Louis, it appears, had hopes of converting him, and securing his aid against the sultan of Egypt. "What honour would be mine," he used to say, "if I could become godfather to this Mussulman king!" Filled with this idea he landed in Africa, near the site of the city of Carthage, but found that he had reckoned without his host. The king of Tunis had no thoughts of renouncing his religion, nor intention of aiding the Crusaders in any way. On the contrary, he opposed their landing with all the forces that could be collected on so sudden an emergency. The French, however, made good their first position, and

defeated the Moslems with considerable loss. They also gained some advantage over the reinforcements that were sent to oppose them; but an infectious flux appeared in the army, and put a stop to all future victories. The soldiers died at the rate of a hundred in a day. The enemy, at the same time, made as great havoc as the plague. St. Louis himself was one of the first attacked by the disease. His constitution had been weakened by fatigues, and even before he left France he was unable to bear the full weight of his armour. It was soon evident to his sorrowing soldiers that their beloved monarch could not long survive. He lingered for some days, and died in Carthage in the fifty-sixth year of his age, deeply regretted by his army and his subjects, and leaving behind him one of the most singular reputations in history. He is the model-king of ecclesiastical writers, in whose eyes his very defects became virtues, because they were manifested in furtherance of their cause. More unprejudiced historians, while they condemn his fanaticism, admit that he was endowed with many high and rare qualities; that he was in no one point behind his age, and in many in advance of it.

His brother, Charles of Anjou, in consequence of a revolution in Sicily, had become king of that country. Before he heard of the death of Louis, he had sailed from Messina with large reinforcements. On his landing near Carthage, he advanced at the head of his army, amid the martial music of drums and trumpets. He was soon informed how inopportune was his rejoicing, and shed tears before his whole army, such as no warrior would have been ashamed to shed. A peace was speedily agreed upon with the king of Tunis, and the armies of France and Sicily returned to their homes.



SEAL OF EDWARD I.

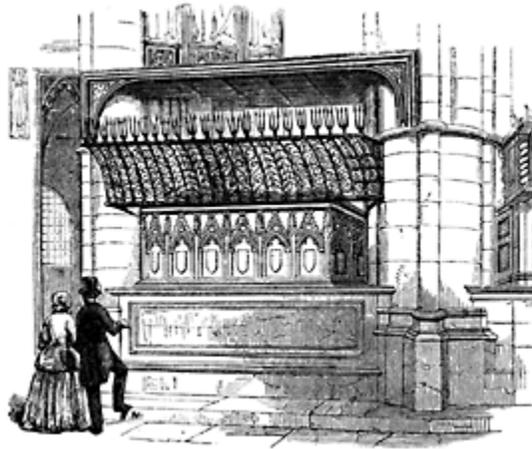
So little favour had the Crusade found in England, that even the exertions of the heir to the throne had only collected a small force of fifteen hundred men. With these few Prince Edward sailed from Dover to Bourdeaux, in the expectation that he would find the French king in that city. St. Louis, however, had left a few weeks previously; upon which Edward followed him to Sardinia, and afterwards to Tunis. Before his arrival in Africa, St. Louis was no more, and peace had been concluded between France and Tunis. He determined, however, not to relinquish the Crusade. Returning to Sicily, he passed the winter in that country, and endeavoured to augment his little army. In the spring he set sail for Palestine, and arrived in safety at Acre. The Christians were torn, as usual, by mutual jealousies and animosities. The two great military orders were as virulent and as intractable as ever; opposed to each other, and to all the world. The arrival of Edward had the effect of causing them to lay aside their unworthy contention, and of uniting heart to heart in one last effort for the deliverance of their adopted country. A force of six thousand effective warriors was soon formed to join those of the English prince, and preparations were made for the renewal of hostilities. The Sultan Bibars or Bendocdar,²¹ a fierce Mamluke, who had been placed on the throne by a bloody revolution, was at war

with all his neighbours, and unable, for that reason, to concentrate his whole strength against them. Edward took advantage of this, and marching boldly forward to Nazareth, defeated the Turks and gained possession of that city. This was the whole amount of his successes. The hot weather engendered disease among his troops, and he himself, the life and soul of the expedition, fell sick among the first. He had been ill for some time, and was slowly recovering, when a messenger desired to speak with him on important matters, and to deliver some despatches into his own hand. While the prince was occupied in examining them, the traitorous messenger drew a dagger from his belt and stabbed him in the breast. The wound fortunately was not deep, and Edward had regained a portion of his strength. He struggled with the assassin, and put him to death with his own dagger, at the same time calling loudly for assistance.²² His attendants came at his call, and found him bleeding profusely, and ascertained on inspection that the dagger was poisoned. Means were instantly taken to purify the wound, and an antidote was sent by the Grand Master of the Templars which removed all danger from the effects of the poison. Camden, in his history, has adopted the more popular, and certainly more beautiful version of this story, which says that the Princess Eleonora, in her love for her gallant husband, sucked the poison from his wound at the risk of her own life: to use the words of old Fuller, "it is a pity so pretty a story should not be true; and that so sovereign a remedy as a woman's tongue, anointed with the virtue of loving affection," should not have performed the good deed.

Edward suspected, and doubtless not without reason, that the assassin was employed by the sultan of Egypt. But it amounted to

suspicion only; and by the sudden death of the assassin the principal clue to the discovery of the truth was lost for ever. Edward, on his recovery, prepared to resume the offensive; but the sultan, embarrassed by the defence of interests which, for the time being, he considered of more importance, made offers of peace to the Crusaders. This proof of weakness on the part of the enemy was calculated to render a man of Edward's temperament more anxious to prosecute the war; but he had also other interests to defend. News arrived in Palestine of the death of his father, King Henry III.; and his presence being necessary in England, he agreed to the terms of the sultan. These were, that the Christians should be allowed to retain their possessions in the Holy Land, and that a truce of ten years should be proclaimed. Edward then set sail for England; and thus ended the last Crusade.

The after-fate of the Holy Land may be told in a few words. The Christians, unmindful of their past sufferings and of the jealous neighbours they had to deal with, first broke the truce by plundering some Egyptian traders near Margat. The sultan immediately revenged the outrage by taking possession of Margat, and war once more raged between the nations. Margat made a gallant defence, but no reinforcements arrived from Europe to prevent its fall. Tripoli was the next, and other cities in succession, until at last Acre was the only city of Palestine that remained in possession of the Christians.



TOMB OF QUEEN ELEANOR.

The Grand Master of the Templars collected together his small and devoted band, and, with the trifling aid afforded by the King of Cyprus, prepared to defend to the death the last possession of his order. Europe was deaf to his cry for aid, the numbers of the foe were overwhelming, and devoted bravery was of no avail. In that disastrous siege the Christians were all but exterminated. The king of Cyprus fled when he saw that resistance was vain, and the Grand Master fell at the head of his knights, pierced with a hundred wounds. Seven Templars, and as many Hospitallers, alone escaped from the dreadful carnage. The victorious Moslems then set fire to the city, and the rule of the Christians in Palestine was brought to a close for ever.

This intelligence spread alarm and sorrow among the clergy of Europe, who endeavoured to rouse once more the energy and enthusiasm of the nations in the cause of the Holy Land. But the popular mania had run its career; the spark of zeal had burned its appointed time, and was never again to be re-illuminated. Here and there a solitary knight announced his determination to take up arms, and now and then a king gave cold encouragement to the scheme;

but it dropped almost as soon as spoken of, to be renewed again, still more feebly, at some longer interval.

Now what was the grand result of all these struggles? Europe expended millions of her treasures, and the blood of two millions of her children; and a handful of quarrelsome knights retained possession of Palestine for about one hundred years! Even had Christendom retained it to this day, the advantage, if confined to that, would have been too dearly purchased. But notwithstanding the fanaticism that originated, and the folly that conducted them, the Crusades were not productive of unmitigated evil. The feudal chiefs became better members of society by coming in contact, in Asia, with a civilisation superior to their own; the people secured some small instalments of their rights; kings, no longer at war with their nobility, had time to pass some good laws; the human mind learned some little wisdom from hard experience, and, casting off the slough of superstition in which the Roman clergy had so long enveloped it, became prepared to receive the seeds of the approaching Reformation. Thus did the all-wise Disposer of events bring good out of evil, and advance the civilisation and ultimate happiness of the nations of the West by means of the very fanaticism that had led them against the East. But the whole subject is one of absorbing interest, and, if carried fully out in all its bearings, would consume more space than the plan of this work will allow. The philosophic student will draw his own conclusions; and he can have no better field for the exercise of his powers than this European madness—its advantages and disadvantages, its causes and results.



ARRAS.

THE WITCH MANIA.

What wrath of gods, or wicked influence
Of tears, conspiring wretched men t' afflict,
Hath pour'd on earth this noxious pestilence
That mortal minds doth inwardly infect
With love of blindness and of ignorance?

Spencer's Tears of the Muses.

Countrymen. Hang her! beat her! kill her!

Justice. How now? Forbear this violence!

Mother Sawyer. A crew of villains—a knot of bloody hangmen! set to torment me! I know not why.

Justice. Alas, neighbour Banks! are you a ringleader in mischief? Fie! to abuse an aged woman!

Banks. Woman! a she hell-cat, a witch! To prove her one, we no sooner set fire on the thatch of her house, but in she came running, as if the devil had sent her in a barrel of gunpowder.

Ford's Witch of Edmonton.

THE belief that disembodied spirits may be permitted to revisit this world has its foundation upon that sublime hope of immortality which is at once the chief solace and greatest triumph of our reason. Even if revelation did not teach us, we feel that we have that within us which shall never die; and all our experience of this life but makes us cling the more fondly to that one repaying hope. But in the early days of "little knowledge" this grand belief became the source of a whole train of superstitions, which, in their turn, became the fount from whence flowed a deluge of blood and horror. Europe, for a period of two centuries and a half, brooded upon the idea, not only that parted spirits walked the earth to meddle in the affairs of men, but that men had power to summon evil spirits to their aid to work woe

upon their fellows. An epidemic terror seized upon the nations; no man thought himself secure, either in his person or possessions, from the machinations of the devil and his agents. Every calamity that befell him he attributed to a witch. If a storm arose and blew down his barn, it was witchcraft; if his cattle died of a murrain—if disease fastened upon his limbs, or death entered suddenly and snatched a beloved face from his hearth—they were not visitations of Providence, but the works of some neighbouring hag, whose wretchedness or insanity caused the ignorant to raise their finger and point at her as a witch. The word was upon every body's tongue. France, Italy, Germany, England, Scotland, and the far north successively ran mad upon this subject, and for a long series of years furnished their tribunals with so many trials for witchcraft, that other crimes were seldom or never spoken of. Thousands upon thousands of unhappy persons fell victims to this cruel and absurd delusion. In many cities of Germany, as will be shewn more fully in its due place hereafter, the average number of executions for this pretended crime was six hundred annually, or two every day, if we leave out the Sundays, when it is to be supposed that even this madness refrained from its work.

A misunderstanding of the famous text of the Mosaic law, "Thou shalt not suffer a witch to live," no doubt led many conscientious men astray, whose superstition, warm enough before, wanted but a little corroboration to blaze out with desolating fury. In all ages of the world men have tried to hold converse with superior beings, and to pierce by their means the secrets of futurity. In the time of Moses, it is evident that there were impostors who trafficked upon the credulity of mankind, and insulted the supreme majesty of the true God by pretending to the power of divination. Hence the law which Moses, by Divine command, promulgated against these criminals; but it did not follow, as the superstitious monomaniacs of the middle ages imagined, that the Bible established the existence of the power of divination by its edicts against those who pretended to it. From the best authorities, it appears that the Hebrew word, which has been

rendered *venefica* and *witch*, means a poisoner and divineress, a dabbler in spells, or fortune-teller. The modern witch was a very different character, and joined to her pretended power of foretelling future events that of working evil upon the life, limbs, and possessions of mankind. This power was only to be acquired by an express compact, signed in blood, with the devil himself, by which the wizard or witch renounced baptism, and sold his or her immortal soul to the evil one, without any saving clause of redemption.

There are so many wondrous appearances in nature for which science and philosophy cannot even now account, that it is not surprising that, when natural laws were still less understood, men should have attributed to supernatural agency every appearance which they could not otherwise explain. The merest tyro now understands various phenomena which the wisest of old could not fathom. The schoolboy knows why, upon high mountains, there should on certain occasions appear three or four suns in the firmament at once, and why the figure of a traveller upon one eminence should be reproduced, inverted and of a gigantic stature, upon another. We all know the strange pranks which imagination can play in certain diseases; that the hypochondriac can see visions and spectres; and that there have been cases in which men were perfectly persuaded that they were teapots. Science has lifted up the veil, and rolled away all the fantastic horrors in which our forefathers shrouded these and similar cases. The man who now imagines himself a wolf is sent to the hospital instead of to the stake, as in the days of the witch mania; and earth, air, and sea are unpeopled of the grotesque spirits that were once believed to haunt them.

Before entering further into the history of Witchcraft, it may be as well if we consider the absurd impersonation of the evil principle formed by the monks in their legends. We must make acquaintance with the *primum mobile*, and understand what sort of a personage it was who gave the witches, in exchange for their souls, the power to torment their fellow-creatures. The popular notion of the devil was, that he was a large, ill-

formed, hairy sprite, with horns, a long tail, cloven feet, and dragon's wings. In this shape he was constantly brought on the stage by the monks in their early "miracles" and "mysteries." In these representations he was an important personage, and answered the purpose of the clown in the modern pantomime. The great fun for the people was to see him well belaboured by the saints with clubs or cudgels, and to hear him howl with pain as he limped off, maimed by the blow of some vigorous anchorite. St. Dunstan generally served him the glorious trick for which he is renowned, catching hold of his nose with a pair of red-hot pincers, till

"Rocks and distant dells resounded with his cries."

Some of the saints spat in his face, to his very great annoyance; and others chopped pieces off of his tail, which, however, always grew on again. This was paying him in his own coin, and amused the populace mightily, for they all remembered the scurvy tricks he had played them and their forefathers. It was believed that he endeavoured to trip people up by laying his long invisible tail in their way, and giving it a sudden whisk when their legs were over it;—that he used to get drunk, and swear like a trooper, and be so mischievous in his cups as to raise tempests and earthquakes, to destroy the fruits of the earth, and the barns and homesteads of true believers;—that he used to run invisible spits into people by way of amusing himself in the long winter evenings, and to proceed to taverns and regale himself with the best, offering in payment pieces of gold which, on the dawn of the following morning, invariably turned into slates. Sometimes, disguised as a large drake, he used to lurk among the bulrushes, and frighten the weary traveller out of his wits by his awful quack. The reader will remember the lines of Burns in his address to the "De'il," which so well express the popular notion on this point:

"Ae dreary, windy, winter night,

The stars shot down wi' sklentin light,
Wi' you mysel, I got a fright
 Ayont the lough;
Ye, like a rash-bush, stood in sight
 Wi' waving sough.

The cudgel in my nieve did shake,
Each bristled hair stood like a stake,
When wi' an eldritch stour, 'quaick! quaick!'
 Among the springs
Awa' ye squattered, like a drake,
 On whistling wings."

In all the stories circulated and believed about him, he was represented as an ugly, petty, mischievous spirit, who rejoiced in playing off all manner of fantastic tricks upon poor humanity. Milton seems to have been the first who succeeded in giving any but a ludicrous description of him. The sublime pride, which is the quintessence of evil, was unconceived before his time. All other limners made him merely grotesque, but Milton made him awful. In this the monks shewed themselves but miserable romancers; for their object undoubtedly was to represent the fiend as terrible as possible. But there was nothing grand about their Satan; on the contrary, he was a low, mean devil, whom it was easy to circumvent, and fine fun to play tricks with. But, as is well and eloquently remarked by a modern writer,²³ the subject has also its serious side. An Indian deity, with its wild distorted shape and grotesque attitude, appears merely ridiculous when separated from its accessories and viewed by daylight in a museum; but restore it to the darkness of its own hideous temple, bring back to our recollection the victims that have bled upon its altar or been crushed beneath its car, and our sense of the ridiculous subsides into aversion and horror. So, while the superstitious dreams of former times are regarded as

mere speculative insanities, we may be for a moment amused with the wild incoherencies of the patients; but when we reflect that out of these hideous misconceptions of the principle of evil arose the belief in witchcraft—that this was no dead faith, but one operating on the whole being of society, urging on the wisest and the mildest to deeds of murder, or cruelties scarcely less than murder—that the learned and the beautiful, young and old, male and female, were devoted by its influence to the stake and the scaffold—every feeling disappears, except that of astonishment that such things could be, and humiliation at the thought that the delusion was as lasting as it was universal.

Besides this chief personage, there was an infinite number of inferior demons, who played conspicuous parts in the creed of witchcraft. The pages of Bekker, Leloyer, Bodin, Delrio, and De Lancre, abound with descriptions of the qualities of these imps, and the functions which were assigned them. From these authors,—three of whom were commissioners for the trial of witches, and who wrote from the confessions made by the supposed criminals and the evidence delivered against them,—and from the more recent work of M. Jules Garinet, the following summary of the creed has been, with great pains, extracted. The student who is desirous of knowing more is referred to the works in question; he will find enough in every leaf to make his blood curdle with shame and horror: but the purity of these pages shall not be soiled by any thing so ineffably humiliating and disgusting as a complete exposition of them; what is here culled will be a sufficient sample of the popular belief, and the reader would but lose time who should seek in the writings of the demonologists for more ample details. He will gain nothing by lifting the veil which covers their unutterable obscenities, unless, like Sterne, he wishes to gather fresh evidence of “what a beast man is.” In that case, he will find plenty there to convince him that the beast would be libelled by the comparison.

It was thought that the earth swarmed with millions of demons of both sexes, many of whom, like the human race, traced their lineage up to

Adam, who after the fall was led astray by devils, assuming the forms of beautiful women to deceive him. These demons “increased and multiplied” among themselves with the most extraordinary rapidity. Their bodies were of the thin air, and they could pass through the hardest substances with the greatest ease. They had no fixed residence or abiding place, but were tossed to and fro in the immensity of space. When thrown together in great multitudes, they excited whirlwinds in the air and tempests in the waters, and took delight in destroying the beauty of nature and the monuments of the industry of man. Although they increased among themselves like ordinary creatures, their numbers were daily augmented by the souls of wicked men, of children still-born, of women who died in childbed, and of persons killed in duels. The whole air was supposed to be full of them, and many unfortunate men and women drew them by thousands into their mouths and nostrils at every inspiration; and the demons, lodging in their bowels or other parts of their bodies, tormented them with pains and diseases of every kind, and sent them frightful dreams. St. Gregory of Nice relates a story of a nun who forgot to say her *benedicite* and make the sign of the cross before she sat down to supper, and who in consequence swallowed a demon concealed among the leaves of a lettuce. Most persons said the number of these demons was so great that they could not be counted, but Wierus asserted that they amounted to no more than seven millions four hundred and five thousand nine hundred and twenty-six; and that they were divided into seventy-two companies or battalions, to each of which there was a prince or captain. They could assume any shape they pleased. When they were male, they were called incubi; and when female, succubi. They sometimes made themselves hideous; and at other times they assumed shapes of such transcendent loveliness, that mortal eyes never saw beauty to compete with theirs.

Although the devil and his legions could appear to mankind at any time, it was generally understood that he preferred the night between Friday and Saturday. If Satan himself appeared in human shape, he was never

perfectly and in all respects like a man. He was either too black or too white, too large or too small, or some of his limbs were out of proportion to the rest of his body. Most commonly his feet were deformed, and he was obliged to curl up and conceal his tail in some part of his habiliments; for, take what shape he would, he could not get rid of that encumbrance. He sometimes changed himself into a tree or a river; and upon one occasion he transformed himself into a barrister, as we learn from Wierus, book iv. chapter 9. In the reign of Philippe le Bel, he appeared to a monk in the shape of a dark man riding a tall black horse, then as a friar, afterwards as an ass and finally as a coach-wheel. Instances are not rare in which both he and his inferior demons have taken the form of handsome young men, and, successfully concealing their tails, have married beautiful young women, who have had children by them. Such children were easily recognisable by their continual shrieking, by their requiring five nurses to suckle them, and by their never growing fat.

All these demons were at the command of any individual who would give up his immortal soul to the prince of evil for the privilege of enjoying their services for a stated period. The wizard or witch could send them to execute the most difficult missions: whatever the witch commanded was performed, except it was a good action, in which case the order was disobeyed, and evil worked upon herself instead.

At intervals, according to the pleasure of Satan, there was a general meeting of the demons and all the witches. This meeting was called the Sabbath, from its taking place on the Saturday, or immediately after midnight on Fridays. These sabbaths were sometimes held for one district, sometimes for another, and once at least every year it was held on the Brocken, or among other high mountains, as a general sabbath of the fiends for the whole of Christendom.

The devil generally chose a place where four roads met as the scene of this assembly, or if that was not convenient, the neighbourhood of a lake. Upon this spot nothing would ever afterwards grow, as the hot feet of the

demons and witches burnt the principle of fecundity from the earth, and rendered it barren for ever. When orders had been once issued for the meeting of the sabbath, all the wizards and witches who failed to attend it were lashed by demons with a rod made of serpents or scorpions, as a punishment for their inattention or want of punctuality.

In France and England the witches were supposed to ride uniformly upon broomsticks; but in Italy and Spain, the devil himself, in the shape of a goat, used to transport them on his back, which lengthened or shortened according to the number of witches he was desirous of accommodating. No witch, when proceeding to the sabbath, could get out by a door or window, were she to try ever so much. Their general mode of ingress was by the keyhole, and of egress by the chimney, up which they flew, broom and all, with the greatest ease. To prevent the absence of the witches from being noticed by their neighbours, some inferior demon was commanded to assume their shapes and lie in their beds, feigning illness, until the sabbath was over.

When all the wizards and witches had arrived at the place of rendezvous, the infernal ceremonies of the sabbath began. Satan, having assumed his favourite shape of a large he-goat, with a face in front and another in his haunches, took his seat upon a throne; and all present, in succession, paid their respects to him, and kissed him in his face behind. This done, he appointed a master of the ceremonies, in company with whom he made a personal examination of all the wizards and witches, to see whether they had the secret mark about them by which they were stamped as the devil's own. This mark was always insensible to pain. Those who had not yet been marked, received the mark from the master of the ceremonies, the devil at the same time bestowing nicknames upon them. This done, they all began to sing and dance in the most furious manner, until some one arrived who was anxious to be admitted into their society. They were then silent for a while, until the new-comer had denied his salvation, kissed the devil, spat

upon the Bible, and sworn obedience to him in all things. They then began dancing again with all their might, and singing these words,

“Alegremos, Alegremos!
Que gente va tenemos!”

In the course of an hour or two they generally became wearied of this violent exercise, and then they all sat down and recounted the evil deeds they had done since their last meeting. Those who had not been malicious and mischievous enough towards their fellow-creatures, received personal chastisement from Satan himself, who flogged them with thorns or scorpions till they were covered with blood, and unable to sit or stand.

When this ceremony was concluded, they were all amused by a dance of toads. Thousands of these creatures sprang out of the earth, and standing on their hind legs, danced, while the devil played the bagpipes or the trumpet. These toads were all endowed with the faculty of speech, and entreated the witches to reward them with the flesh of unbaptised babes for their exertions to give them pleasure. The witches promised compliance. The devil bade them remember to keep their word; and then stamping his foot, caused all the toads to sink into the earth in an instant. The place being thus cleared, preparation was made for the banquet, where all manner of disgusting things were served up and greedily devoured by the demons and witches; although the latter were sometimes regaled with choice meats and expensive wines from golden plates and crystal goblets; but they were never thus favoured unless they had done an extraordinary number of evil deeds since the last period of meeting.

After the feast, they began dancing again; but such as had no relish for any more exercise in that way, amused themselves by mocking the holy sacrament of baptism. For this purpose, the toads were again called up, and sprinkled with filthy water; the devil making the sign of the cross, and

all the witches calling out, “*In nomine Patricâ, Aragueaco Petrica, agora! agora! Valentia, jouando goure gaits goustia!*” which meant, “In the name of Patrick, Petrick of Aragon, now, now, all our ills are over!”

When the devil wished to be particularly amused, he made the witches strip off their clothes and dance before him, each with a cat tied round her neck, and another dangling from her body in form of a tail. When the cock crew, they all disappeared, and the sabbath was ended.

This is a summary of the belief which prevailed for many centuries nearly all over Europe, and which is far from eradicated even at this day. It was varied in some respects in several countries, but the main points were the same in France, Germany, Great Britain, Italy, Spain, and the far North of Europe.

The early annals of France abound with stories of supposed sorcery, but it was not until the time of Charlemagne that the crime acquired any great importance. “This monarch,” says M. Jules Garinet,²⁴ “had several times given orders that all necromancers, astrologers, and witches should be driven from his states; but as the number of criminals augmented daily, he found it necessary at last to resort to severer measures. In consequence, he published several edicts, which may be found at length in the *Capitulaire de Baluse*. By these, every sort of magic, enchantment, and witchcraft was forbidden; and the punishment of death decreed against those who in any way evoked the devil, compounded love-philters, afflicted either man or woman with barrenness, troubled the atmosphere, excited tempests, destroyed the fruits of the earth, dried up the milk of cows, or tormented their fellow-creatures with sores and diseases. All persons found guilty of exercising these execrable arts were to be executed immediately upon conviction, that the earth might be rid of the burden and curse of their presence; and those even who consulted them might also be punished with death.”²⁵

After this time, prosecutions for witchcraft are continually mentioned, especially by the French historians. It was a crime imputed with so much

ease, and repelled with so much difficulty, that the powerful, whenever they wanted to ruin the weak, and could fix no other imputation upon them, had only to accuse them of witchcraft to ensure their destruction. Instances in which this crime was made the pretext for the most violent persecution, both of individuals and of communities, whose real offences were purely political or religious, must be familiar to every reader. The extermination of the Stedinger in 1234, of the Templars from 1307 to 1313, the execution of Joan of Arc in 1429, and the unhappy scenes of Arras in 1459, are the most prominent. The first of these is perhaps the least known, but is not among the least remarkable. The following account, from Dr. Kortüm's interesting history ²⁶ of the republican confederacies of the middle ages, will shew the horrible convenience of imputations of witchcraft when royal or priestly wolves wanted a pretext for a quarrel with the sheep.

The Frieslanders, inhabiting the district from the Weser to the Zuydersee, had long been celebrated for their attachment to freedom, and their successful struggles in its defence. As early as the eleventh century they had formed a general confederacy against the encroachments of the Normans and the Saxons, which was divided into seven *seelands*, holding annually a diet under a large oak-tree at Aurich, near the Upstalboom. Here they managed their own affairs, without the control of the clergy and ambitious nobles who surrounded them, to the great scandal of the latter. They already had true notions of a representative government. The deputies of the people levied the necessary taxes, deliberated on the affairs of the community, and performed, in their simple and patriarchal manner, nearly all the functions of the representative assemblies of the present day. Finally, the Archbishop of Bremen, together with the Count of Oldenburg and other neighbouring potentates, formed a league against that section of the Frieslanders known by the name of the Stedinger, and succeeded, after harassing them and sowing dissensions among them for many years, in bringing them under the yoke. But the Stedinger, devotedly attached to

their ancient laws, by which they had attained a degree of civil and religious liberty very uncommon in that age, did not submit without a violent struggle. They arose in insurrection in the year 1204, in defence of the ancient customs of their country, refused to pay taxes to the feudal chiefs or tithes to the clergy—who had forced themselves into their peaceful retreats—and drove out many of their oppressors. For a period of eight-and-twenty years the brave Stedinger continued the struggle single-handed against the forces of the Archbishops of Bremen and the Counts of Oldenburg, and destroyed, in the year 1232, the strong castle of Slutterberg, near Delmenhorst, built by the latter nobleman as a position from which he could send out his marauders to plunder and destroy the possessions of the peasantry.

The invincible courage of these poor people proving too strong for their oppressors to cope with by the ordinary means of warfare, the Archbishop of Bremen applied to Pope Gregory IX. for his spiritual aid against them. That prelate entered cordially into the cause, and launching forth his anathema against the Stedinger as heretics and witches, encouraged all true believers to assist in their extermination. A large body of thieves and fanatics broke into their country in the year 1233, killing and burning wherever they went, and not sparing either women or children, the sick or the aged, in their rage. The Stedinger, however, rallied in great force, routed their invaders, and killed in battle their leader, Count Burckhardt of Oldenburg, with many inferior chieftains.

Again the pope was applied to, and a crusade against the Stedinger was preached in all that part of Germany. The pope wrote to all the bishops and leaders of the faithful an exhortation to arm, to root out from the land those abominable witches and wizards. “The Stedinger,” said his holiness, “seduced by the devil, have abjured all the laws of God and man, slandered the Church, insulted the holy sacraments, consulted witches to raise evil spirits, shed blood like water, taken the lives of priests, and concocted an infernal scheme to propagate the worship of the devil, whom they adore

under the name of Asmodi. The devil appears to them in different shapes,—sometimes as a goose or a duck, and at others in the figure of a pale black-eyed youth, with a melancholy aspect, whose embrace fills their hearts with eternal hatred against the holy Church of Christ. This devil presides at their sabbaths, when they all kiss him and dance around him. He then envelopes them in total darkness, and they all, male and female, give themselves up to the grossest and most disgusting debauchery.”

In consequence of these letters of the pope, the emperor of Germany, Frederic II., also pronounced his ban against them. The Bishops of Ratzebourg, Lubeck, Osnabrück, Munster, and Minden took up arms to exterminate them, aided by the Duke of Brabant, the Counts of Holland, of Clèves, of the Mark, of Oldenburg, of Egmond, of Diest, and many other powerful nobles. An army of forty thousand men was soon collected, which marched, under the command of the Duke of Brabant, into the country of the Stedinger. The latter mustered vigorously in defence of their lives and liberties, but could raise no greater force, including every man capable of bearing arms, than eleven thousand men to cope against the overwhelming numbers of their foe. They fought with the energy of despair, but all in vain. Eight thousand of them were slain on the field of battle; the whole race was exterminated; and the enraged conquerors scoured the country in all directions, slew the women and children and old men, drove away the cattle, fired the woods and cottages, and made a total waste of the land.



PHILIP IV.

Just as absurd and effectual was the charge brought against the Templars in 1307, when they had rendered themselves obnoxious to the potentates and prelacy of Christendom. Their wealth, their power, their pride, and their insolence had raised up enemies on every side; and every sort of accusation was made against them, but failed to work their overthrow, until the terrible cry of witchcraft was let loose upon them. This effected its object, and the Templars were extirpated. They were accused of having sold their souls to the devil, and of celebrating all the infernal mysteries of the witches' sabbath. It was pretended that, when they admitted a novice into their order, they forced him to renounce his salvation and curse Jesus Christ; that they then made him submit to many unholy and disgusting ceremonies, and forced him to kiss the superior on the cheek, the navel, and the breech, and spit three times upon a crucifix; that all the members were forbidden to have connexion with women, but might give themselves up without restraint to every species of unmentionable debauchery; that when by any mischance a Templar infringed this order, and a child was born, the whole order met, and tossed it about like a shuttlecock from one to the other until it expired; that they then roasted it by a slow fire, and with the fat which trickled from it anointed the hair and beard of a large image of the devil. It was also said that when one of the knights died, his body was burnt into a powder, and then mixed with wine and drunk by every member of the order. Philip IV., who, to exercise his own implacable hatred, invented, in all probability, the greater part of these charges, issued orders for the immediate arrest of all the Templars in his dominions. The pope afterwards took up the cause with almost as much fervour as the king of France; and in every part of Europe the Templars were thrown into prison, and their goods and estates confiscated. Hundreds of them, when put to the rack, confessed even the most preposterous of the charges against them, and by so doing increased the popular clamour and the hopes of their enemies. It is true that, when removed from the rack, they denied all they had previously confessed; but

this circumstance only increased the outcry, and was numbered as an additional crime against them. They were considered in a worse light than before, and condemned forthwith to the flames as relapsed heretics. Fifty-nine of these unfortunate victims were all burned together by a slow fire in a field in the suburbs of Paris, protesting to the very last moment of their lives their innocence of the crimes imputed to them, and refusing to accept of pardon upon condition of acknowledging themselves guilty. Similar scenes were enacted in the provinces; and for four years hardly a month passed without witnessing the execution of one or more of these unhappy men. Finally, in 1313, the last scene of this tragedy closed by the burning of the Grand-Master, Jacques de Molay, and his companion Guy, the commander of Normandy. Any thing more atrocious it is impossible to conceive,—disgraceful alike to the monarch who originated, the pope who supported, and the age which tolerated the monstrous iniquity. That the malice of a few could invent such a charge is a humiliating thought for the lover of his species; but that millions of mankind should credit it is still more so.

The execution of Joan of Arc is the next most notorious example which history affords us of the imputation of witchcraft against a political enemy. Instances of similar persecution, in which this crime was made the pretext for the gratification of political or religious hatred, might be multiplied to a great extent. But it is better to proceed at once to the consideration of the bull of Pope Innocent, the torch that set fire to the long-laid train, and caused so fearful an explosion over the Christian world. It will be necessary, however, to go back for some years anterior to that event, the better to understand the motives that influenced the Church in the promulgation of that fearful document.

Towards the close of the fourteenth and beginning of the fifteenth century, many witches were burned in different parts of Europe. As a natural consequence of the severe persecution, the crime, or the pretenders to it, increased. Those who found themselves accused and threatened with

the penalties, if they happened to be persons of a bad and malicious disposition, wished they had the power imputed to them, that they might be revenged upon their persecutors. Numerous instances are upon record of half-crazed persons being found muttering the spells which were supposed to raise the evil one. When religion and law alike recognised the crime, it is no wonder that the weak in reason and the strong in imagination, especially when they were of a nervous temperament, fancied themselves endued with the terrible powers of which all the world was speaking. The belief of their neighbours did not lag behind their own, and execution was the speedy consequence.



JOAN OF ARC.

As the fear of witchcraft increased, the Catholic clergy strove to fix the imputation of it upon those religious sects, the pioneers of the Reformation, who began about this time to be formidable to the Church of Rome. If a charge of heresy could not ensure their destruction, that of sorcery and witchcraft never failed. In the year 1459, a devoted congregation of the Waldenses at Arras, who used to repair at night to worship God in their own manner in solitary places, fell victims to an accusation of sorcery. It was rumoured in Arras that in the desert places to which they retired the devil appeared before them in human form, and read from a large book his laws and ordinances, to which they all promised obedience; that he then distributed money and food among them, to bind them to his service, which done, they gave themselves up to every species of lewdness and debauchery. Upon these rumours several creditable persons in Arras were seized and imprisoned, together with a number of

decrepit and idiotic old women. The rack, that convenient instrument for making the accused confess any thing, was of course put in requisition. Monstrelet, in his chronicle, says that they were tortured until some of them admitted the truth of the whole accusations, and said, besides, that they had seen and recognised in their nocturnal assemblies many persons of rank; many prelates, seigneurs, governors of bailliages, and mayors of cities, being such names as the examiners had themselves suggested to the victims. Several who had been thus informed against were thrown into prison, and so horribly tortured, that reason fled, and in their ravings of pain they also confessed their midnight meetings with the devil, and the oaths they had taken to serve him. Upon these confessions judgment was pronounced. The poor old women, as usual in such cases, were hanged and burned in the market-place; the more wealthy delinquents were allowed to escape upon payment of large sums. It was soon after universally recognised that these trials had been conducted in the most odious manner, and that the judges had motives of private vengeance against many of the more influential persons who had been implicated. The parliament of Paris afterwards declared the sentence illegal, and the judges iniquitous; but its *arrêt* was too late to be of service even to those who had paid the fine, or to punish the authorities who had misconducted themselves, for it was not delivered until thirty-two years after the executions had taken place.

In the mean time, accusations of witchcraft spread rapidly in France, Italy, and Germany. Strange to say, that although in the first instance chiefly directed against heretics, the latter were as firm believers in the crime as even the Catholics themselves. In after times we also find that the Lutherans and Calvinists became greater witch-burners than ever the Romanists had been, so deeply was the prejudice rooted. Every other point of belief was in dispute, but that was considered by every sect to be as well established as the authenticity of the Scriptures or the existence of a God.

But at this early period of the epidemic the persecutions were directed by the heads of the Catholic Church. The spread of heresy betokened, it was thought, the coming of Antichrist. Florimond, in his work concerning Antichrist, exposed the secret of these prosecutions. He says: "All who have afforded us some signs of the approach of Antichrist agree that the increase of sorcery and witchcraft is to distinguish the melancholy period of his advent; and was ever age so afflicted as ours? The seats destined for criminals in our courts of justice are blackened with persons accused of this guilt. There are not judges enough to try them. Our dungeons are gorged with them. No day passes that we do not render our tribunals bloody by the dooms which we pronounce, or in which we do not return to our homes discountenanced and terrified at the horrible confessions which we have heard. And the devil is accounted so good a master, that we cannot commit so great a number of his slaves to the flames but what there shall arise from their ashes a sufficient number to supply their place."

Florimond here spoke the general opinion of the Church of Rome; but it never suggested itself to the mind of any person engaged in these trials, that if it were indeed a devil who raised up so many new witches to fill the places of those consumed, it was no other than one in their own employ—the devil of persecution. But so it was. The more they burned, the more they found to burn, until it became a common prayer with women in the humbler walks of life, that they might never live to grow old. It was sufficient to be aged, poor, and half-crazed, to ensure death at the stake or the scaffold.



GATE OF CONSTANCE.

In the year 1487 there was a severe storm in Switzerland, which laid waste the country for four miles around Constance. Two wretched old women, whom the popular voice had long accused of witchcraft, were arrested on the preposterous charge of having raised the tempest. The rack was displayed, and the two poor creatures were extended upon it. In reply to various questions from their tormentors, they owned in their agony that they were in the constant habit of meeting the devil; that they had sold their souls to him; and that at their command he had raised the tempest. Upon this insane and blasphemous charge they were condemned to die. In the criminal registers of Constance there stands against the name of each the simple but significant phrase, "*convicta et combusta.*"

This case and hundreds of others were duly reported to the ecclesiastical powers. There happened at that time to be a pontiff at the head of the Church who had given much of his attention to the subject of witchcraft, and who, with the intention of rooting out the supposed crime, did more to increase it than any other man that ever lived. John Baptist Cibo, elected to the papacy in 1485, under the designation of Innocent VIII., was sincerely alarmed at the number of witches, and launched forth his terrible manifesto against them. In his celebrated bull of 1488, he called the nations of Europe to the rescue of the Church of Christ upon earth, imperilled by the arts of Satan, and set forth the horrors that had reached

his ears; how that numbers of both sexes had intercourse with the infernal fiends; how by their sorceries they afflicted both man and beast; how they blighted the marriage-bed, destroyed the births of women and the increase of cattle; and how they blasted the corn on the ground, the grapes of the vineyard, the fruits of the trees, and the herbs of the field. In order that criminals so atrocious might no longer pollute the earth, he appointed inquisitors in every country, armed with the apostolic power to convict and punish.

It was now that the *Witch Mania*, properly so called, may be said to have fairly commenced. Immediately a class of men sprang up in Europe, who made it the sole business of their lives to discover and burn the witches. Sprenger, in Germany, was the most celebrated of these national scourges. In his notorious work, the *Malleus Maleficarum*, he laid down a regular form of trial, and appointed a course of examination by which the inquisitors in other countries might best discover the guilty. The questions, which were always enforced by torture, were of the most absurd and disgusting nature. The inquisitors were required to ask the suspected whether they had midnight meetings with the devil? whether they attended the witches' sabbath on the Brocken? whether they had their familiar spirits? whether they could raise whirlwinds and call down the lightning? and whether they had had sexual intercourse with Satan?

Straightway the inquisitors set to work: Cumanus, in Italy, burned forty-one poor women in one province alone; and Sprenger, in Germany, burned a number which can never be ascertained correctly, but which, it is agreed on all hands, amounted to more than five hundred in a year. The great resemblance between the confessions of the unhappy victims was regarded as a new proof of the existence of the crime. But this is not astonishing. The same questions from the *Malleus Maleficarum* were put to them all, and torture never failed to educe the answer required by the inquisitor. Numbers of people, whose imaginations were filled with these horrors, went further in the way of confession than even their tormentors

anticipated, in the hope that they would thereby be saved from the rack, and put out of their misery at once. Some confessed that they had had children by the devil; but no one who had ever been a mother gave utterance to such a frantic imagining, even in the extremity of her anguish. The childless only confessed it, and were burned instanter as unworthy to live.

For fear the zeal of the enemies of Satan should cool, successive popes appointed new commissions. One was appointed by Alexander VI. in 1494, another by Leo X. in 1521, and a third by Adrian VI. in 1522. They were all armed with the same powers to hunt out and destroy, and executed their fearful functions but too rigidly. In Geneva alone five hundred persons were burned in the years 1515 and 1516, under the title of Protestant witches. It would appear that their chief crime was heresy, and their witchcraft merely an aggravation. Bartolomeo de Spina has a list still more fearful. He informs us that in the year 1524 no less than a thousand persons suffered death for witchcraft in the district of Como, and that for several years afterwards the average number of victims exceeded a hundred annually. One inquisitor, Remigius, took great credit to himself for having, during fifteen years, convicted and burned nine hundred.

In France, about the year 1520, fires for the execution of witches blazed in almost every town. Danæus, in his *Dialogues of Witches*, says they were so numerous that it would be next to impossible to tell the number of them. So deep was the thralldom of the human mind, that the friends and relatives of the accused parties looked on and approved. The wife or sister of a murderer might sympathise in his fate, but the wives and husbands of sorcerers and witches had no pity. The truth is that pity was dangerous, for it was thought no one could have compassion on the sufferings of a witch who was not a dabbler in sorcery: to have wept for a witch would have insured the stake. In some districts, however, the exasperation of the people broke out, in spite of superstition. The inquisitor of a rural township in Piedmont burned the victims so plentifully and so fast, that there was

not a family in the place which did not lose a member. The people at last arose, and the inquisitor was but too happy to escape from the country with whole limbs. The archbishop of the diocese proceeded afterwards to the trial of such as the inquisitor had left in prison.

Some of the charges were so utterly preposterous that the poor wretches were at once liberated; others met a harder, but the usual fate. Some of them were accused of having joined the witches' dance at midnight under a blasted oak, where they had been seen by creditable people. The husbands of several of these women (two of whom were young and beautiful) swore positively that at the time stated their wives were comfortably asleep in their arms; but it was all in vain. Their word was taken, but the archbishop told them they had been deceived by the devil and their own senses. It was true they might have had the semblance of their wives in their beds, but the originals were far away at the devil's dance under the oak. The honest fellows were confounded, and their wives burned forthwith.



CHARLES IX.

In the year 1561, five poor women of Verneuil were accused of transforming themselves into cats, and in that shape attending the sabbath of the fiends—prowling around Satan, who presided over them in the form of a goat, and dancing, to amuse him, upon his back. They were found guilty, and burned.²⁷

In 1564, three wizards and a witch appeared before the Presidents Salvert and D'Avanton: they confessed, when extended on the rack, that they anointed the sheep-pens with infernal unguents to kill the sheep; that they attended the sabbath, where they saw a great black goat, which spoke to them, and made them kiss him, each holding a lighted candle in his hand while he performed the ceremony. They were all executed at Poitiers.

In 1571 the celebrated sorcerer Trois Echelles was burned in the Place de Grève in Paris. He confessed, in the presence of Charles IX., and of the Marshals de Montmorency, De Retz, and the Sieur du Mazille, physician to the king, that he could perform the most wonderful things by the aid of a devil to whom he had sold himself. He described at great length the saturnalia of the fiends, the sacrifices which they offered up, the debaucheries they committed with the young and handsome witches, and the various modes of preparing the infernal unguent for blighting cattle. He said he had upwards of twelve hundred accomplices in the crime of witchcraft in various parts of France, whom he named to the king, and many of whom were afterwards arrested and suffered execution.

At Dôle, two years afterwards, Gilles Garnier, a native of Lyons, was indicted for being a *loup-garou*, or man-wolf, and for prowling in that shape about the country at night to devour little children. The indictment against him, as read by Henri Camus, doctor of laws and counsellor of the king, was to the effect that he, Gilles Garnier, had seized upon a little girl, twelve years of age, whom he drew into a vineyard and there killed, partly with his teeth and partly with his hands, seeming like wolf's paws; that from thence he trailed her bleeding body along the ground with his teeth into the wood of La Serre, where he ate the greatest portion of her at one meal, and carried the remainder home to his wife; that upon another occasion, eight days before the festival of All Saints, he was seen to seize another child in his teeth, and would have devoured her had she not been rescued by the country people, and that the said child died a few days afterwards of the injuries he had inflicted; that fifteen days after the same festival of All Saints, being again in the shape of a

wolf, he devoured a boy thirteen years of age, having previously torn off his leg and thigh with his teeth, and hid them away for his breakfast on the morrow. He was furthermore indicted for giving way to the same diabolical and unnatural propensities even in his shape of a man; and that he had strangled a boy in a wood with the intention of eating him, which crime he would have effected if he had not been seen by the neighbours and prevented.

Gilles Garnier was put to the rack after fifty witnesses had deposed against him. He confessed every thing that was laid to his charge. He was thereupon brought back into the presence of his judges, when Dr. Camus, in the name of the parliament of Dôle, pronounced the following sentence:

“Seeing that Gilles Garnier has, by the testimony of credible witnesses, and by his own spontaneous confession, been proved guilty of the abominable crimes of lycanthropy and witchcraft, this court condemns him, the said Gilles, to be this day taken in a cart from this spot to the place of execution, accompanied by the executioner (*maître exécuteur de la haute justice*), where he, by the said executioner, shall be tied to a stake and burned alive, and that his ashes be then scattered to the winds. The court further condemns him, the said Gilles, to the costs of this prosecution.”

“Given at Dôle, this 18th day of January, 1573.”

In 1578, the parliament of Paris was occupied for several days with the trial of a man named Jacques Rollet. He also was found guilty of being a *loup-garou*, and in that shape devouring a little boy. He was burnt alive in the Place de Grève.

In 1579, so much alarm was excited in the neighbourhood of Melun by the increase of witches and *loup-garous*, that a council was held to devise some measures to stay the evil. A decree was passed that all witches and consultants with witches should be punished with death; and not only those, but fortune-tellers and conjurors of every kind. The parliament of Rouen took up the same question in the following year, and decreed that the possession of a *grimoire*, or book of spells, was sufficient evidence of witchcraft, and that all persons on whom such books were found should be burned alive. Three councils were held in different parts of France in the year 1583, all in relation to the same subject. The parliament of Bourdeaux issued strict injunctions to all curates and clergy whatever to use redoubled efforts to root out the crime of witchcraft. The parliament of Tours was equally peremptory, and feared the judgments of an offended God if all these dealers with the devil were not swept from the face of the land. The parliament of Rheims was particularly severe against the *nouveurs d'aiguillette*, or “tyers of the knot”—people of both sexes who took pleasure in preventing the consummation of marriage, that they might counteract the command of God to our first parents to increase and multiply. This parliament held it to be sinful to wear amulets to preserve from witchcraft; and that this practice might not be continued within its jurisdiction, drew up a form of exorcism, which would more effectually defeat the agents of the devil, and put them to flight.

A case of witchcraft, which created a great sensation in its day, occurred in 1588, at a village in the mountains of Auvergne, about two leagues from Apchon. A gentleman of that place being at his window, there passed a friend of his who had been out hunting, and

who was then returning to his own house. The gentleman asked his friend what sport he had had; upon which the latter informed him that he had been attacked in the plain by a large and savage wolf, which he had shot at without wounding, and that he had then drawn out his hunting-knife and cut off the animal's fore-paw as it sprang upon his neck to devour him. The huntsman upon this put his hand into his bag to pull out the paw, but was shocked to find that it was a woman's hand, with a wedding-ring on the finger. The gentleman immediately recognised his wife's ring, "which," says the indictment against her, "made him begin to suspect some evil of her." He immediately went in search of her, and found her sitting by the fire in the kitchen, with her arm hidden underneath her apron. He tore off her apron with great vehemence, and found that she had no hand, and that the stump was even then bleeding. She was given into custody, and burnt at Riom in presence of some thousands of spectators.²⁸

In the midst of these executions, rare were the gleams of mercy. Few instances are upon record of any acquittal taking place when the crime was witchcraft. The discharge of fourteen persons by the parliament of Paris, in the year 1589, is almost a solitary example of a return to reason. Fourteen persons condemned to death for witchcraft appealed against the judgment to the parliament of Paris, which for political reasons had been exiled to Tours. The parliament named four commissioners—Pierre Pigray, the king's surgeon, and Messieurs Leroi, Renard, and Falaiseau, the king's physicians—to visit and examine these witches, and see whether they had the mark of the devil upon them. Pigray, who relates the circumstance in his work on Surgery (book vii. chap. 10), says the visit was made in

presence of two counsellors of the court. The witches were all stripped naked, and the physicians examined their bodies very diligently, pricking them in all the marks they could find to see whether they were insensible to pain, which was always considered a certain proof of guilt. They were, however, very sensible of the pricking, and some of them called out very lustily when the pins were driven into them. "We found them," continues Pierre Pigray, "to be very poor, stupid people, and some of them insane. Many of them were quite indifferent about life, and one or two of them desired death as a relief for their sufferings. Our opinion was, that they stood more in need of medicine than of punishment; and so we reported to the parliament. Their case was thereupon taken into further consideration; and the parliament, after mature counsel amongst all the members, ordered the poor creatures to be sent to their homes, without inflicting any punishment upon them."

Such was the dreadful state of Italy, Germany, and France during the sixteenth century, which was far from being the worst crisis of the popular madness with regard to witchcraft. Let us see what was the state of England during the same period. The Reformation, which in its progress had rooted out so many errors, stopped short at this, the greatest error of all. Luther and Calvin were as firm believers in witchcraft as Pope Innocent himself; and their followers shewed themselves more zealous persecutors than the Romanists. Dr. Hutchinson, in his work on Witchcraft, asserts that the mania manifested itself later in England, and raged with less virulence than on the continent. The first assertion only is true; for though the persecution began later both in England and Scotland, its progress was as fearful as elsewhere.

It was not until more than fifty years after the issuing of the bull of Innocent VIII. that the legislature of England thought fit to make any more severe enactments against sorcery than those already in operation. The statute of 1541 was the first that specified the particular crime of witchcraft. At a much earlier period many persons had suffered death for sorcery, in addition to other offences; but no executions took place for attending the witches' sabbath, raising tempests, afflicting cattle with barrenness, and all the fantastic trumpery of the continent. Two statutes were passed in 1551: the first relating to false prophecies, caused mainly, no doubt, by the impositions of Elizabeth Barton, the holy maid of Kent, in 1534; and the second against conjuration, witchcraft, and sorcery. But even this enactment did not consider witchcraft as penal in itself, and only condemned to death those who, by means of spells, incantations, or contracts with the devil, attempted the lives of their neighbours. The statute of Elizabeth, in 1562, at last recognised witchcraft as a crime of the highest magnitude, whether exerted or not to the injury of the lives, limbs, and possessions of the community. From that date the persecution may be fairly said to have commenced in England. It reached its climax in the early part of the seventeenth century, which was the hottest period of the mania all over Europe.

A few cases of witch persecution in the sixteenth century will enable the reader to form a more accurate idea of the progress of this great error than if he plunged at once into that busy period of its history when Matthew Hopkins and his coadjutors exercised their infernal calling. Several instances occur in England during the latter years of the reign of Elizabeth. At this time the public mind had

become pretty familiar with the details of the crime. Bishop Jewell, in his sermons before her majesty, used constantly to conclude them by a fervent prayer that she might be preserved from witches. Upon one occasion, in 1598, his words were, “It may please your grace to understand that witches and sorcerers within these last four years are marvellously increased within this your grace’s realm. Your grace’s subjects pine away even unto the death; their colour fadeth—their flesh rotteth—their speech is benumbed—their senses are bereft! I pray God they may never practise further than upon the *subject!*”



JEWELL.

By degrees, an epidemic terror of witchcraft spread into the villages. In proportion as the doctrine of the Puritans took root, this dread increased, and, of course, brought persecution in its train. The Church of England has claimed, and is entitled to the merit, of having been less influenced in these matters than any other sect of Christians; but still they were tainted with the superstition of the age. One of the most flagrant instances of cruelty and delusion upon record was consummated under the authority of the Church, and commemorated till a very late period by an annual lecture at the University of Cambridge.

This is the celebrated case of the witches of Warbois, who were executed about thirty-two years after the passing of the statute of Elizabeth. Although in the interval but few trials are recorded, there is, unfortunately, but too much evidence to shew the extreme length to which the popular prejudice was carried. Many women lost their lives in every part of England without being brought to trial at all, from the injuries received at the hands of the people. The number of these can never be ascertained.

The case of the witches of Warbois merits to be detailed at length, not only from the importance attached to it for so many years by the learned of the University, but from the singular absurdity of the evidence upon which men, sensible in all other respects, could condemn their fellow-creatures to the scaffold.

The principal actors in this strange drama were the families of Sir Samuel Cromwell and a Mr. Throgmorton, both gentlemen of landed property near Warbois in the county of Huntingdon. Mr. Throgmorton had several daughters, the eldest of whom, Mistress Joan, was an imaginative and melancholy girl, whose head was filled with stories of ghosts and witches. Upon one occasion she chanced to pass the cottage of one Mrs., or, as she was called, Mother Samuel, a very aged, a very poor, and a very ugly woman. Mother Samuel was sitting at her door knitting, with a black cap upon her head, when this silly young lady passed, and taking her eyes from her work she looked stedfastly at her. Mistress Joan immediately fancied that she felt sudden pains in all her limbs, and from that day forth never ceased to tell her sisters, and every body about her, that Mother Samuel had bewitched her. The other children took up the cry, and

actually frightened themselves into fits whenever they passed within sight of this terrible old woman.

Mr. and Mrs. Throgmorton, not a whit wiser than their children, believed all the absurd tales they had been told; and Lady Cromwell, a gossip of Mrs. Throgmorton, made herself very active in the business, and determined to bring the witch to the ordeal. The sapient Sir Samuel joined in the scheme; and the children, thus encouraged, gave loose reins to their imaginations, which seem to have been of the liveliest. They soon invented a whole host of evil spirits, and names for them besides, which they said were sent by Mother Samuel to torment them continually. Seven spirits especially, they said, were raised from hell by this wicked woman to throw them into fits; and as the children were actually subject to fits, their mother and her commeres gave the more credit to the story. The names of these spirits were, "First Smack," "Second Smack," "Third Smack," "Blue," "Catch," "Hardname," and "Pluck."

Throgmorton, the father, was so pestered by these idle fancies, and yet so well inclined to believe them, that he marched valiantly forth to the hut where Mother Samuel resided with her husband and daughter, and dragged her forcibly into his own grounds. Lady Cromwell, Mrs. Throgmorton, and the girls were in waiting, armed with long pins to prick the witch, and see if they could draw blood from her. Lady Cromwell, who seems to have been the most violent of the party, tore the old woman's cap off her head, and plucking out a handful of her grey hair, gave it to Mrs. Throgmorton to burn, as a charm which would preserve them all from her future machinations. It was no wonder that the poor creature, subjected to this rough usage, should give vent to an involuntary curse upon her tormentors.

She did so, and her curse was never forgotten. Her hair, however, was supposed to be a grand specific, and she was allowed to depart, half dead with terror and ill-usage. For more than a year the families of Cromwell and Throgmorton continued to persecute her, and to assert that her imps afflicted them with pains and fits, turned the milk sour in their pans, and prevented their cows and ewes from bearing. In the midst of these fooleries, Lady Cromwell was taken ill and died. It was then remembered that her death had taken place exactly a year and a quarter since she was cursed by Mother Samuel, and that on several occasions she had dreamed of the witch and a black cat, the latter being of course the arch-enemy of mankind himself.

Sir Samuel Cromwell now conceived himself bound to take more energetic measures against the sorceress, since he had lost his wife by her means. The year and a quarter and the black cat were proofs positive. All the neighbours had taken up the cry of witchcraft against Mother Samuel; and her personal appearance, unfortunately for her, the very ideal of what a witch ought to be, increased the popular suspicion. It would appear that at last the poor woman believed, even to her own disadvantage, that she was what every body represented her to be. Being forcibly brought into Mr. Throgmorton's house, when his daughter Joan was in one of her customary fits, she was commanded by him and Sir Samuel Cromwell to expel the devil from the young lady. She was told to repeat her exorcism, and to add, "as I am a witch, and the causer of Lady Cromwell's death, I charge thee, fiend, to come out of her!" She did as was required of her; and moreover confessed that her husband and daughter were leagued with her in witchcraft, and had, like her, sold their souls to the devil.

The whole family were immediately arrested, and sent to Huntingdon to prison.

The trial was instituted shortly afterwards before Mr. Justice Fenner, when all the crazy girls of Mr. Throgmorton's family gave evidence against Mother Samuel and her family. They were all three put to the torture. The old woman confessed in her anguish that she was a witch; that she had cast her spells upon the young ladies; and that she had caused the death of Lady Cromwell. The father and daughter, stronger in mind than their unfortunate wife and parent, refused to confess any thing, and asserted their innocence to the last. They were all three condemned to be hanged, and their bodies burned. The daughter, who was young and good-looking, excited the pity of many persons, and she was advised to plead pregnancy, that she might gain at least a respite from death. The poor girl refused proudly, on the ground that she would not be accounted both a witch and a strumpet. Her half-witted old mother caught at the idea of a few weeks' longer life, and asserted that she was pregnant. The court was convulsed with laughter, in which the wretched victim herself joined; and this was accounted an additional proof that she was a witch. The whole family were executed on the 7th of April, 1593.

Sir Samuel Cromwell, as lord of the manor, received the sum of 40*l.* out of the confiscated property of the Samuels, which he turned into a rent-charge of 40*s.* yearly, for the endowment of an annual sermon or lecture upon the enormity of witchcraft, and this case in particular, to be preached by a doctor or bachelor of divinity of Queen's College, Cambridge. I have not been able to ascertain the exact date at which this annual lecture was discontinued; but it

appears to have been preached so late as 1718, when Dr. Hutchinson published his work upon witchcraft.

To carry on in proper chronological order the history of the witch delusion in the British isles, it will be necessary to examine into what was taking place in Scotland during all that part of the sixteenth century anterior to the accession of James VI. to the crown of England. We naturally expect that the Scotch—a people renowned from the earliest times for their powers of imagination—should be more deeply imbued with this gloomy superstition than their neighbours of the south. The nature of their soil and climate tended to encourage the dreams of early ignorance. Ghosts, goblins, wraiths, kelpies, and a whole host of spiritual beings, were familiar to the dwellers by the misty glens of the Highlands and the romantic streams of the Lowlands. Their deeds, whether of good or ill, were enshrined in song, and took a greater hold upon the imagination because “verse had sanctified them.” But it was not till the religious reformers began the practice of straining Scripture to the severest extremes that the arm of the law was called upon to punish witchcraft as a crime *per se*. What Pope Innocent VIII. had done for Germany and France, the preachers of the Reformation did for the Scottish people. Witchcraft, instead of being a mere article of faith, became enrolled in the statute-book; and all good subjects and true Christians were called upon to take arms against it. The ninth parliament of Queen Mary passed an act in 1563, which decreed the punishment of death against witches and consulters with witches, and immediately the whole bulk of the people were smitten with an epidemic fear of the devil and his mortal agents. Persons in the highest ranks of life shared and encouraged the delusion of the

vulgar. Many were themselves accused of witchcraft; and noble ladies were shewn to have dabbled in mystic arts, and proved to the world that if they were not witches, it was not for want of the will.

Among the dames who became notorious for endeavouring to effect their wicked ends by the devil's aid may be mentioned the celebrated Lady Buccleugh of Bransholme (familiar to all the readers of Sir Walter Scott), the Countess of Lothian, the Countess of Angus, the Countess of Athol, Lady Kerr, the Countess of Huntley, Euphemia Macalzean (the daughter of Lord Cliftonhall), and Lady Fowlis. Among the celebrated of the other sex who were accused of wizardism was Sir Lewis Ballantyne, the Lord Justice-Clerk for Scotland, who, if we may believe Scot of Scotstarvet, "dealt by curiosity with a warlock called Richard Grahame," and prayed him to raise the devil. The warlock consented, and raised him *in propria personâ* in the yard of his house in the Canongate, "at sight of whom the Lord Justice-Clerk was so terrified, that he took sickness and thereof died." By such idle reports as these did the envious ruin the reputation of those they hated; though it would appear in this case that Sir Lewis had been fool enough to make the attempt of which he was accused, and that the success of the experiment was the only apocryphal part of the story.



JOHN KNOX.

The enemies of John Knox invented a similar tale, which found ready credence among the Roman Catholics, glad to attach any stigma to that grand scourge of the vices of their Church. It was reported that he and his secretary went into the churchyard of St. Andrew's with the intent to raise "some sanctes;" but that, by a mistake in their conjurations, they raised the great fiend himself instead of the saints they wished to consult. The popular rumour added, that Knox's secretary was so frightened at the great horns, goggle eyes, and long tail of Satan, that he went mad, and shortly afterwards died. Knox himself was built of sterner stuff, and was not to be frightened.

The first name that occurs in the records of the High Court of Justiciary of persons tried or executed for witchcraft, is that of Janet Bowman in 1572, nine years after the passing of the act of Mary. No particulars of her crimes are given, and against her name there only stands the words, "convict and brynt." It is not, however, to be inferred, that in this interval no trials or executions took place; for it appears, on the authority of documents of unquestioned authenticity in the Advocates' Library at Edinburgh,²⁹ that the Privy Council made a practice of granting commissions to resident gentlemen and ministers in every part of Scotland to examine, try, and execute witches within their own parishes. No records of those who suffered from the sentence of these tribunals have been preserved; but if popular tradition may be believed even to the amount of one-fourth of its assertions, their number was fearful. After the year 1572, the entries of executions for witchcraft in the records of the High Court become more frequent, but do not average more than one per annum,—another proof that trials for this offence were in general

entrusted to the local magistracy. The latter appear to have ordered witches to the stake with as little compunction, and after as summary a mode, as modern justices of the peace order a poacher to the stocks.

As James VI. advanced in manhood, he took great interest in the witch trials. One of them especially—that of Gellie Duncan, Dr. Fian, and their accomplices, in the year 1591—engrossed his whole attention, and no doubt suggested in some degree the famous work on Demonology, which he wrote shortly afterwards. As these witches had made an attempt upon his own life, it is not surprising, with his habits, that he should have watched the case closely, or become strengthened in his prejudice and superstition by its singular details. No other trial that could be selected would give so fair an idea of the delusions of the Scottish people as this. Whether we consider the number of victims, the absurdity of the evidence, and the real villany of some of the persons implicated, it is equally extraordinary.

Gellie Duncan, the prime witch in these proceedings, was servant to the deputy bailiff of Tranent, a small town in Haddingtonshire, about ten miles from Edinburgh. Though neither old nor ugly (as witches usually were), but young and good-looking, her neighbours, from some suspicious parts of her behaviour, had long considered her a witch. She had, it appears, some pretensions to the healing art. Some cures which she effected were so sudden, that the worthy bailiff, her master, who, like his neighbours, mistrusted her, considered them no less than miraculous. In order to discover the truth, he put her to the torture; but she obstinately refused to confess that she had dealings with the devil. It was the popular belief that no witch would confess as long as the mark which Satan had put upon

her remained undiscovered upon her body. Somebody present reminded the torturing bailie of this fact, and on examination, the devil's mark was found upon the throat of poor Gellie. She was put to the torture again, and her fortitude giving way under the extremity of her anguish, she confessed that she was indeed a witch—that she had sold her soul to the devil, and effected all her cures by his aid. This was something new in the witch creed, according to which, the devil delighted more in laying diseases on than in taking them off; but Gellie Duncan fared no better on that account. The torture was still applied, until she had named all her accomplices, among whom were one Cunningham, a reputed wizard, known by the name of Dr. Fian; a grave and matron-like witch, named Agnes Sampson; Euphemia Macalzean, the daughter of Lord Cliftonhall, already mentioned, and nearly forty other persons, some of whom were the wives of respectable individuals in the city of Edinburgh. Every one of these persons was arrested, and the whole realm of Scotland thrown into commotion by the extraordinary nature of the disclosures which were anticipated.

About two years previous to this time, James had suddenly left his kingdom, and proceeded gallantly to Denmark, to fetch over his bride, the Princess of Denmark, who had been detained by contrary weather in the harbour of Upslo. After remaining for some months in Copenhagen, he set sail with his young bride, and arrived safely in Leith, on the 1st of May 1590, having experienced a most boisterous passage, and been nearly wrecked. As soon as the arrest of Gellie Duncan and Fian became known in Scotland, it was reported by every body who pretended to be well-informed, that these witches and their associates had, by the devil's means, raised the storms

which had endangered the lives of the king and queen. Gellie, in her torture, had confessed that such was the fact, and the whole kingdom waited aghast and open-mouthed for the corroboration about to be furnished by the trial.

Agnes Sampson, the “grave and matron-like” witch implicated by Gellie Duncan, was put to the horrible torture of the *pilliewinkis*. She laid bare all the secrets of the sisterhood before she had suffered an hour, and confessed that Gellie Duncan, Dr. Fian, Marian Lincup, Euphemia Macalzean, herself, and upwards of two hundred witches and warlocks, used to assemble at midnight in the kirk of North Berwick, where they met the devil; that they had plotted there to attempt the king’s life; that they were incited to this by the old fiend himself, who had asserted with a thundering oath that James was the greatest enemy he ever had, and that there would be no peace for the devil’s children upon earth until he were got rid of; that the devil upon these occasions always liked to have a little music, and that Gellie Duncan used to play a reel before him on a trump or Jew’s harp, to which all the witches danced.

James was highly flattered at the idea that the devil should have said that he was the greatest enemy he ever had. He sent for Gellie Duncan to the palace, and made her play before him the same reel which she had played at the witches’ dance in the kirk.



TORTURE OF THE BOOTS.

Dr. Fian, or rather Cunningham, a petty schoolmaster of Tranent, was put to the torture among the rest. He was a man who had led an infamous life, was a compounder of and dealer in poisons, and a pretender to magic. Though not guilty of the preposterous crimes laid to his charge, there is no doubt that he was a sorcerer in will, though not in deed, and that he deserved all the misery he endured. When put on the rack, he would confess nothing, and held out so long unmoved, that the severe torture of the *boots* was resolved upon. He endured this till exhausted nature could bear no longer, when insensibility kindly stepped in to his aid. When it was seen that he was utterly powerless, and that his tongue cleaved to the roof of his mouth, he was released. Restoratives were administered; and during the first faint gleam of returning consciousness, he was prevailed upon to sign, ere he well knew what he was about, a full confession, in strict accordance with those of Gellie Duncan and Agnes Sampson. He was then remanded to his prison, from which, after two days, he managed, some how or other, to escape. He was soon recaptured, and brought before the Court of Justiciary, James himself being present. Fian now denied all the circumstances of the written confession which he had signed; whereupon the king, enraged at his “stubborn wilfulness,” ordered him once more to the torture. His finger nails were riven out with pincers, and long needles thrust up to the eye into the quick; but he did not wince. He was then consigned again to the *boots*, in which, to quote a pamphlet published at the time,³⁰ he continued “so long, and abode so many blows in them, that his legs were crushed and beaten together as small as might be, and the bones and flesh so bruised, that the blood

and marrow spouted forth in great abundance, whereby they were made unserviceable for ever.”

The astonishing similarity of the confessions of all the persons implicated in these proceedings has often been remarked. It would appear that they actually endeavoured to cause the king's death by their spells and sorceries. Fian, who was acquainted with all the usual tricks of his profession, deceived them with pretended apparitions, so that many of them were really convinced that they had seen the devil. The sum of their confessions was to the following effect:

Satan, who was, of course, a great foe of the reformed religion, was alarmed that King James should marry a Protestant princess. To avert the consequences to the realms of evil, he had determined to put an end to the king and his bride by raising a storm on their voyage home. Satan, first of all, sent a thick mist over the waters, in the hope that the king's vessel might be stranded on the coast amid the darkness. This failing, Dr. Fian, who, from his superior scholarship, was advanced to the dignity of the devil's secretary, was commanded to summon all the witches to meet their master, each one sailing on a sieve on the high seas.

On All Hallowmas Eve, they assembled to the number of upwards of two hundred, including Gellie Duncan, Agnes Sampson, Euphemia Macalzean, one Barbara Napier, and several warlocks; and each embarking in a riddle or sieve, they sailed “over the ocean very substantially.” After cruising about for some time, they met with the fiend, bearing in his claws a cat, which had been previously drawn nine times through the fire. This he delivered to one of the warlocks, telling him to cast it into the sea and cry “Hola!” This was done with

all solemnity, and immediately the ocean became convulsed, the waters hissed loudly, and the waves rose mountains high,

“Twisting their arms to the dun-coloured heaven.”

The witches sailed gallantly through the tempest they had raised, and landing on the coast of Scotland, took their sieves in their hands and marched on in procession to the haunted kirk of North Berwick, where the devil had resolved to hold a preaching. Gellie Duncan, the musician of the party, tripped on before, playing on her Jew’s harp and singing,

“Cummer, go ye before, cummer, go ye;
Gif ye will not go before, cummer, let me!”

Arrived at the kirk, they paced around it *withershins*, that is, in reverse of the apparent motion of the sun. Dr. Fian then blew into the keyhole of the door, which opened immediately, and all the witches entered. As it was pitch dark, Fian blew with his mouth upon the candles, which immediately lighted, and the devil was seen occupying the pulpit. He was attired in a black gown and hat, and the witches saluted him by crying “All hail, master!” His body was hard, like iron; his face terrible; his nose, like the beak of an eagle; he had great burning eyes; his hands and legs were hairy; and he had long claws upon his hands and feet, and spake with an exceedingly gruff voice. Before commencing his sermon he called over the names of his congregation, demanding whether they had been good servants, and

what success had attended their operations against the life of the king and his bride.

Gray Meill, a crazy old warlock, who acted as beadle or door-keeper, was silly enough to answer “that nothing ailed the king yet, God be thanked;” upon which the devil, in a rage, stepped down from the pulpit and boxed his ears for him. He then remounted and commenced the preaching, commanding them to be dutiful servants to him and do all the evil they could. Euphemia Macalzean and Agnes Sampson, bolder than the rest, asked him whether he had brought the image or picture of King James, that they might, by pricking it, cause pains and diseases to fall upon him. “The father of lies” spoke truth for once, and confessed that he had forgotten it; upon which Euphemia Macalzean upbraided him loudly for his carelessness. The devil, however, took it all in good part, although Agnes Sampson and several other women let loose their tongues at him immediately. When they had done scolding, he invited them all to a grand entertainment. A newly buried corpse was dug up and divided among them, which was all they had in the way of edibles. He was more liberal in the matter of drink, and gave them so much excellent wine that they soon became jolly. Gellie Duncan then played the old tune upon her trump, and the devil himself led off the dance with Euphemia Macalzean. Thus they kept up the sport till the cock crew.



JAMES THE DEMONOLOGIST.

Agnes Sampson, the wise woman of Keith, as she was called, added some other particulars in her confession. She stated, that on a previous occasion, she had raised an awful tempest in the sea by throwing a cat into it, with four joints of men tied to its feet. She said also, that on their grand attempt to drown King James, they did not meet with the devil after cruising about, but that he had accompanied them from the first, and that she had seen him dimly in the distance, rolling himself before them over the great waves, in shape and size not unlike a huge haystack. They met with a foreign ship richly laden with wines and other good things, which they boarded, and sunk after they had drunk all the wine and made themselves quite merry.

Some of these disclosures were too much even for the abundant faith of King James, and he more than once exclaimed, that the witches were like their master, "extreme lyars." But they confessed many other things of a less preposterous nature, and of which they were no doubt really guilty. Agnes Sampson said she was to have taken the king's life by anointing his linen with a strong poison. Gellie Duncan used to threaten her neighbours by saying she would send the devil after them; and many persons of weaker minds than usual were frightened into fits by her, and rendered subject to them

for the remainder of their lives. Dr. Fian also made no scruple in aiding and abetting murder, and would rid any person of an enemy by means of poison, who could pay him his fee for it. Euphemia Macalzean also was far from being pure. There is no doubt that she meditated the king's death, and used such means to compass it as the superstition of the age directed. She was a devoted partisan of Bothwell, who was accused by many of the witches as having consulted them on the period of the king's death. They were all found guilty, and sentenced to be hanged and burned. Barbara Napier, though found guilty upon other counts, was acquitted upon the charge of having been present at the great witch meeting in Berwick kirk. The king was highly displeased, and threatened to have the jury indicted for a wilful error upon an assize. They accordingly reconsidered their verdict, and threw themselves upon the king's mercy for the fault they had committed. James was satisfied, and Barbara Napier was hanged along with Gellie Duncan, Agnes Sampson, Dr. Fian, and five-and-twenty others. Euphemia Macalzean met a harder fate. Her connexion with the bold and obnoxious Bothwell, and her share in poisoning one or two individuals who had stood in her way, were thought deserving of the severest punishment the law could inflict. Instead of the ordinary sentence, directing the criminal to be first strangled and then burned, the wretched woman was doomed "to be bound to a stake, and burned in ashes, *quick* to the death." This cruel sentence was executed on the 25th of June, 1591.

These trials had the most pernicious consequences all over Scotland. The lairds and ministers in their districts, armed with due power from the privy council, tried and condemned old women after

the most summary fashion. Those who still clung to the ancient faith of Rome were the severest sufferers, as it was thought, after the disclosures of the fierce enmity borne by the devil towards a Protestant king and his Protestant wife, that all the Catholics were leagued with the powers of evil to work woe on the realm of Scotland. Upon a very moderate calculation, it is presumed that from the passing of the act of Queen Mary till the accession of James to the throne of England, a period of thirty-nine years, the average number of executions for witchcraft in Scotland was two hundred annually, or upwards of seventeen thousand altogether. For the first nine years the number was not one quarter so great; but towards the years 1590 to 1593, the number must have been more than four hundred. The case last cited was one of an extraordinary character. The general aspect of the trials will be better seen from that of Isabel Gowdie, which, as it would be both wearisome and disgusting to go through them all, is given as a fair specimen, although it took place at a date somewhat later than the reign of James. This woman, wearied of her life by the persecutions of her neighbours, voluntarily gave herself up to justice, and made a confession, embodying the whole witch-creed of the period. She was undoubtedly a monomaniac of the most extraordinary kind. She said that she deserved to be stretched upon an iron rack, and that her crimes could never be atoned for, even if she were to be drawn asunder by wild horses. She named a long list of her associates, including nearly fifty women and a few warlocks. They dug up the graves of unchristened infants, whose limbs were serviceable in their enchantments. When they wanted to destroy the crops of an enemy, they yoked toads to his plough, and on the following night Satan himself ploughed the land with his team, and

blasted it for the season. The witches had power to assume almost any shape; but they generally chose either that of a cat or a hare, oftenest the latter. Isabel said, that on one occasion, when she was in this disguise, she was sore pressed by a pack of hounds, and had a very narrow escape with her life. She reached her own door at last, feeling the hot breath of the pursuing dogs at her haunches. She managed, however, to hide herself behind a chest, and got time to pronounce the magic words that could alone restore her to her proper shape. They were:

“Hare! hare!

God send thee care!

I am in a hare’s likeness now;

But I shall be a woman e’en now!

Hare! hare!

God send thee care!”

If witches, when in this shape, were bitten by the dogs, they always retained the marks in their human form; but she had never heard that any witch had been bitten to death. When the devil appointed any general meeting of the witches, the custom was that they should proceed through the air mounted on broomsticks, or on corn or bean-straws, pronouncing as they went:

“Horse and paddock, horse and go,

Horse and pellats, ho! ho! ho!”

They generally left behind them a broom or a three-legged stool, which, when placed in their beds and duly charmed, assumed the human shape till their return. This was done that the neighbours might not know when they were absent.

She added that the devil furnished his favourite witches with servant imps to attend upon them. These imps were called, "The Roaring Lion," "Thief of Hell," "Wait-upon-Herself," "Ranting Roarer," "Care-for-Naught," &c., and were known by their liveries, which were generally yellow, sad-dun, sea-green, pea-green, or grass-green. Satan never called the witches by the names they had received at baptism; neither were they allowed, in his presence, so to designate each other. Such a breach of the infernal etiquette assuredly drew down his most severe displeasure. But as some designation was necessary, he re-baptised them in their own blood by the names of "Able-and-Stout," "Over-the-dike-with-it," "Raise-the-wind," "Pickle-nearest-the-wind," "Batter-them-down-Maggy," "Blow-Kale," and such like. The devil himself was not very particular what name they called him, so that it was not "Black John." If any witch was unthinking enough to utter these words, he would rush out upon her and beat and buffet her unmercifully, or tear her flesh with a wool-card. Other names he did not care about; and once gave instructions to a noted warlock that whenever he wanted his aid, he was to strike the ground three times and exclaim, "Rise up, foul thief!"



SIR G. MACKENZIE.

Upon this confession many persons were executed. So strong was the popular feeling, that no one once accused of witchcraft was acquitted; at least acquittals did not average one in a hundred trials. Witch-finding, or witch-pricking, became a trade, and a set of mercenary vagabonds roamed about the country provided with long pins to run into the flesh of supposed criminals. It was no unusual thing then, nor is it now, that in aged persons there should be some spot on the body totally devoid of feeling. It was the object of the witch-pricker to discover this spot, and the unhappy wight who did not bleed when pricked upon it was doomed to the death. If not immediately cast into prison, her life was rendered miserable by the persecution of her neighbours. It is recorded of many poor women, that the annoyances they endured in this way were so excessive, that they preferred death. Sir George Mackenzie, the Lord Advocate, at the time when witch trials were so frequent, and himself a devout

believer in the crime, relates, in his *Criminal Law*, first published in 1678, some remarkable instances of it. He says, "I went, when I was a justice-depute, to examine some women who had confessed judicially; and one of them, who was a silly creature, told me, under secrecy, that she had not confessed because she was guilty, but being a poor creature, who wrought for her meat, and being defamed for a witch, she knew she should starve, for no person thereafter would either give her meat or lodging, and that all men would beat her and set dogs at her, and that, therefore, she desired to be out of the world; whereupon she wept most bitterly, and upon her knees called God to witness to what she said." Sir George, though not wholly elevated above the prejudices of his age upon this subject, was clear-sighted enough to see the danger to society of the undue encouragement given to the witch prosecutions. He was convinced that three-fourths of them were unjust and unfounded. He says, in the work already quoted, that the persons who were in general accused of this crime were poor ignorant men and women who did not understand the nature of the accusation, and who mistook their own superstitious fears for witchcraft. One poor wretch, a weaver, confessed that he was a warlock, and, being asked why, he replied, because "he had seen the devil dancing, like a fly, about the candle!" A simple woman, who, because she was called a witch, believed that she was, asked the judge upon the bench whether a person might be a witch and not know it? Sir George adds, that all the supposed criminals were subjected to severe torture in prison from their gaolers, who thought they did God good service by vexing and tormenting them; "and I know," says this humane and enlightened magistrate, "that this usage was the ground of all their confession;

and albeit, the poor miscreants cannot prove this usage, the actors in it being the only witnesses; yet the judge should be jealous of it, as that which did at first elicit the confession, and for fear of which they dare not retract it.” Another author,³¹ also a firm believer in witchcraft, gives a still more lamentable instance of a woman who preferred execution as a witch to live on under the imputation. This woman, who knew that three others were to be strangled and burned on an early day, sent for the minister of the parish, and confessed that she had sold her soul to Satan. “Whereupon being called before the judges, she was condemned to die with the rest. Being carried forth to the place of execution, she remained silent during the first, second, and third prayer, and then, perceiving that there remained no more but to rise and go to the stake, she lifted up her body, and, with a loud voice, cried out, ‘Now all you that see me this day, know that I am now to die as a witch, by my own confession; and I free all men, especially the ministers and magistrates, of the guilt of my blood. I take it wholly upon myself. My blood be upon my own head. And, as I must make answer to the God of heaven presently, I declare I am as free of witchcraft as any child. But, being delated by a malicious woman, and put in prison under the name of a witch, disowned by my husband and friends, and seeing no ground of hope of ever coming out again, I made up that confession to destroy my own life, being weary of it, and choosing rather to die than to live.’” As a proof of the singular obstinacy and blindness of the believers in witches, it may be stated that the minister who relates this story only saw in the dying speech of the unhappy woman an additional proof that she was a witch. True, indeed is it, that “none are so blind as those who will not see.”

It is time, however, to return to James VI., who is fairly entitled to share with Pope Innocent, Sprenger, Bodinus, and Matthew Hopkins the glory or the odium of being at the same time a chief enemy and chief encourager of witchcraft. Towards the close of the sixteenth century, many learned men, both on the continent and in the isles of Britain, had endeavoured to disabuse the public mind on this subject. The most celebrated were Wierus, in Germany; Pietro d'Apone, in Italy; and Reginald Scot, in England. Their works excited the attention of the zealous James, who, mindful of the involuntary compliment which his merits had extorted from the devil, was ambitious to deserve it by still continuing "his greatest enemy." In the year 1597, he published in Edinburgh his famous treatise on Demonology. Its design may be gathered from the following passage in the introduction: "The fearful abounding," says the king, "at this time and in this country of these detestable slaves of the devil, the witches or enchanters, hath moved me, beloved reader, to despatch in post this following treatise of mine, not in any wise, as I protest, to serve for a show of mine own learning and ingenue [ingenuity], but only (moved of conscience) to press thereby, so far as I can, to resolve the doubting hearts of many, both that such assaults of Satan are most certainly practised, and that the instrument thereof merits most severely to be punished, against the damnable opinions of two, principally in our age; whereof the one called Scot, an Englishman, is not ashamed in public print to deny that there can be such thing as witchcraft, and so maintains the old error of the Sadducees in denying of spirits. The other, called Wierus, a German physician, sets out a public apology for all these crafts-folks, whereby procuring for them impunity, he plainly betrays himself to have been one of that

profession.” In other parts of this treatise, which the author had put into the form of a dialogue, to “make it more pleasant and facile,” he says: “Witches ought to be put to death, according to the law of God, the civil and imperial law, and the municipal law of all Christian nations: yea, to spare the life, and not strike whom God bids strike and so severely punish in so odious a treason against God, is not only unlawful, but doubtless as great a sin in the magistrate as was Saul’s sparing Agag.” He says also that the crime is so abominable, that it may be proved by evidence which would not be received against any other offenders,—young children, who knew not the nature of an oath, and persons of an infamous character, being sufficient witnesses against them; but lest the innocent should be accused of a crime so difficult to be acquitted of, he recommends that in all cases the ordeal should be resorted to. He says, “Two good helps may be used: the one is the finding of their mark, and the trying the insensibleness thereof; the other is their floating on the water,—for, as in a secret murder, if the dead carcass be at any time thereafter handled by the murderer, it will gush out of blood, as if the blood were crying to Heaven for revenge of the murderer (God having appointed that secret supernatural sign for trial of that secret unnatural crime), so that it appears that God hath appointed (for a supernatural sign of the monstrous impiety of witches) that the water shall refuse to receive them in her bosom that have shaken off them the sacred water of baptism, and wilfully refused the benefit thereof;—no, not so much as their eyes are able to shed tears (threaten and torture them as you please), while first they repent (God not permitting them to dissemble their obstinacy in so horrible a crime); albeit, the womenkind especially, be able otherwise to shed tears at

every light occasion when they will, yea, although it were dissembling like the crocodiles.”



PIETRO D'APONE.

When such doctrines as these were openly promulgated by the highest authority in the realm, and who, in promulgating them, flattered, but did not force the public opinion, it is not surprising that the sad delusion should have increased and multiplied until the race of wizards and witches replenished the earth. The reputation which he lost by being afraid of a naked sword, he more than regained by his courage in combating the devil. The Kirk shewed itself a most zealous coadjutor, especially during those halcyon days when it was not at issue with the king upon other matters of doctrine and prerogative.

On his accession to the throne of England in 1603, James came amongst a people who had heard with admiration of his glorious deeds against the witches. He himself left no part of his ancient prejudices behind him; and his advent was the signal for the persecution to burst forth in England with a fury equal to that in Scotland. It had languished a little during the latter years of the reign of Elizabeth; but the very first parliament of King James brought

forward the subject. James was flattered by their promptitude, and the act passed in 1604. On the second reading in the House of Lords, the bill passed into a committee, in which were twelve bishops. By it was enacted, "That if any person shall use, practise, or exercise any conjuration of any wicked or evil spirit, or shall consult, covenant with, or feed any such spirit, the first offence to be imprisonment for a year, and standing in the pillory once a quarter; the second offence to be death."

The minor punishment seems but rarely to have been inflicted. Every record that has been preserved mentions that the witches were hanged and burned, or burned, without the previous strangling, "alive and quick." During the whole of James's reign, amid the civil wars of his successor, the sway of the Long Parliament, the usurpation of Cromwell, and the reign of Charles II., there was no abatement of the persecution. If at any time it raged with less virulence, it was when Cromwell and the Independents were masters. Dr. Zachary Grey, the editor of an edition of "Hudibras," informs us, in a note to that work, that he himself perused a list of three thousand witches who were executed in the time of the Long Parliament alone. During the first eighty years of the seventeenth century, the number executed has been estimated at five hundred annually, making the frightful total of forty thousand. Some of these cases deserve to be cited. The great majority resemble closely those already mentioned; but two or three of them let in a new light upon the popular superstition.

Every one has heard of the "Lancashire witches," a phrase now used to compliment the ladies of that county for their bewitching beauty; but it is not every one who has heard the story in which it

originated. A villanous boy, named Robinson, was the chief actor in the tragedy. He confessed many years afterwards that he had been suborned by his father and other persons to give false evidence against the unhappy witches whom he brought to the stake. The time of this famous trial was about the year 1634. This boy Robinson, whose father was a wood-cutter, residing on the borders of Pendle Forest, in Lancashire, spread abroad many rumours against one Mother Dickenson, whom he accused of being a witch. These rumours coming to the ears of the local magistracy, the boy was sent for and strictly examined. He told the following extraordinary story without hesitation or prevarication, and apparently in so open and honest a manner, that no one who heard him doubted the truth of it. He said, that as he was roaming about in one of the glades of the forest, amusing himself by gathering blackberries, he saw two greyhounds before him, which he thought at the time belonged to some gentleman of the neighbourhood. Being fond of sport, he proposed to have a course; and a hare being started, he incited the hounds to run. Neither of them would stir. Angry at the beasts, he seized hold of a switch, with which he was about to punish them, when one of them suddenly started up in the form of a woman, and the other of a little boy. He at once recognised the woman to be the witch Mother Dickenson. She offered him some money to induce him to sell his soul to the devil; but he refused. Upon this she took a bridle out of her pocket, and shaking it over the head of the other little boy, he was instantly turned into a horse. Mother Dickenson then seized him in her arms, sprang upon the horse, and placing him before her, rode with the swiftness of the wind over forests, fields, bogs, and rivers, until they came to a large barn. The witch alighted

at the door, and, taking him by the hand, led him inside. There he saw seven old women pulling at seven halters which hung from the roof. As they pulled, large pieces of meat, lumps of butter, loaves of bread, basins of milk, hot puddings, black puddings, and other rural dainties, fell from the halters on to the floor. While engaged in this charm, they made such ugly faces, and looked so fiendish, that he was quite frightened. After they had pulled in this manner enough for an ample feast, they set-to, and shewed, whatever might be said of the way in which their supper was procured, that their epicurism was a little more refined than that of the Scottish witches, who, according to Gellie Duncan's confession, feasted upon dead men's flesh in the old kirk of Berwick. The boy added, that as soon as supper was ready, many other witches came to partake of it, several of whom he named.

In consequence of this story, many persons were arrested, and the boy Robinson was led about from church to church, in order that he might point out to the officers by whom he was accompanied the hags he had seen in the barn. Altogether, about twenty persons were thrown into prison; eight of them were condemned to die, including Mother Dickenson, upon this evidence alone, and executed accordingly. Among the wretches who concocted this notable story, not one was ever brought to justice for his perjury; and Robinson, the father, gained considerable sums by threatening persons who were rich enough to buy off exposure.

Among the ill-weeds which flourished amid the long dissensions of the civil war, Matthew Hopkins, the witch-finder, stands eminent in his sphere. This vulgar fellow resided, in the year 1644, at the town of Manningtree, in Essex, and made himself very conspicuous in

discovering the devil's marks upon several unhappy witches. The credit he gained by his skill in this instance seems to have inspired him to renewed exertions. In the course of a very short time, whenever a witch was spoken of in Essex, Matthew Hopkins was sure to be present, aiding the judges with his knowledge of "such cattle," as he called them. As his reputation increased, he assumed the title of "Witch-finder General," and travelled through the counties of Norfolk, Essex, Huntingdon, and Sussex, for the sole purpose of finding out witches. In one year he brought sixty poor creatures to the stake. The test he commonly adopted was that of swimming, so highly recommended by King James in his *Demonologie*. The hands and feet of the suspected persons were tied together crosswise, the thumb of the right hand to the toe of the left foot, and *vice versa*. They were then wrapped up in a large sheet or blanket, and laid upon their backs in a pond or river. If they sank, their friends and relatives had the poor consolation of knowing they were innocent; but there was an end of them: if they floated, which, when laid carefully on the water, was generally the case, there was also an end of them; for they were deemed guilty of witchcraft, and burned accordingly.

Another test was to make them repeat the Lord's prayer and creed. It was affirmed that no witch could do so correctly. If she missed a word, or even pronounced one incoherently, which in her trepidation it was most probable she would, she was accounted guilty. It was thought that witches could not weep more than three tears, and those only from the left eye. Thus the conscious innocence of many persons, which gave them fortitude to bear unmerited torture without flinching, was construed by their unmerciful tormentors into proofs of guilt. In some districts the test resorted to was to weigh the

culprit against the church Bible. If the suspected witch proved heavier than the Bible, she was set at liberty. This mode was far too humane for the witch-finders by profession. Hopkins always maintained that the most legitimate modes were pricking and swimming.

Hopkins used to travel through his counties like a man of consideration, attended by his two assistants, always putting up at the chief inn of the place, and always at the cost of the authorities. His charges were twenty shillings a town, his expenses of living while there, and his carriage thither and back. This he claimed whether he found witches or not. If he found any, he claimed twenty shillings a head in addition when they were brought to execution. For about three years he carried on this infamous trade, success making him so insolent and rapacious that high and low became his enemies. The Rev. Mr. Gaul, a clergyman of Houghton, in Huntingdonshire, wrote a pamphlet impugning his pretensions, and accusing him of being a common nuisance. Hopkins replied in an angry letter to the functionaries of Houghton, stating his intention to visit their town; but desiring to know whether it afforded many such sticklers for witchcraft as Mr. Gaul, and whether they were willing to receive and entertain him with the customary hospitality, if he so far honoured them. He added, by way of threat, that in case he did not receive a satisfactory reply, "he would waive their shire altogether, and betake himself to such places where he might do and punish, not only without control, but with thanks and recompense." The authorities of Houghton were not much alarmed at this awful threat of letting them alone. They very wisely took no notice either of him or his letter.

Mr. Gaul describes in his pamphlet one of the modes employed by Hopkins, which was sure to swell his revenues very considerably. It was a proof even more atrocious than the swimming. He says, that the “Witch-finder General” used to take the suspected witch and place her in the middle of a room, upon a stool or table, cross-legged, or in some other uneasy posture. If she refused to sit in this manner, she was bound with strong cords. Hopkins then placed persons to watch her for four-and-twenty hours, during which time she was to be kept without meat or drink. It was supposed that one of her imps would come during that interval and suck her blood. As the imp might come in the shape of a wasp, a moth, a fly, or other insect, a hole was made in the door or window to let it enter. The watchers were ordered to keep a sharp look out, and endeavour to kill any insect that appeared in the room. If any fly escaped, and they could not kill it, the woman was guilty; the fly was her imp, and she was sentenced to be burned, and twenty shillings went into the pockets of Master Hopkins. In this manner he made one old woman confess, because four flies had appeared in the room, that she was attended by four imps, named “Ilemazar,” “Pye-wackett,” “Peck-in-the-crown,” and “Grizel-Greedigut.”



MATTHEW HOPKINS.³²

It is consoling to think that this impostor perished in his own snare. Mr. Gaul's exposure and his own rapacity weakened his influence among the magistrates; and the populace, who began to find that not even the most virtuous and innocent were secure from his persecution, looked upon him with undisguised aversion. He was beset by a mob at a village in Suffolk, and accused of being himself a wizard. An old reproach was brought against him, that he had, by means of sorcery, cheated the devil out of a certain memorandum-book, in which he, Satan, had entered the names of all the witches in England. "Thus," said the populace, "you find out witches, not by God's aid, but by the devil's." In vain he denied his guilt. The populace longed to put him to his own test. He was speedily stripped, and his thumbs and toes tied together. He was then placed in a blanket, and cast into a pond. Some say that he floated, and that he was taken out, tried, and executed upon no other proof of his guilt.

Others assert that he was drowned. This much is positive, that there was an end of him. As no judicial entry of his trial and execution is to be found in any register, it appears most probable that he expired by the hands of the mob. Butler has immortalised this scamp in the following lines of his *Hudibras*:

“Hath not this present Parliament
A lieger to the devil sent,
Fully empower’d to treat about
Finding revolted witches out?
And has he not within a year
Hang’d threescore of them in one shire?
Some only for not being drown’d,
And some for sitting above ground
Whole days and nights upon their breeches,
And feeling pain, were hang’d for witches;
And some for putting knavish tricks
Upon green geese or turkey chicks;
Or pigs that suddenly deceased
Of griefs unnatural, as he guessed;
Who proved himself at length a witch,
And made a rod for his own breech.”

In Scotland also witch-finding became a trade. They were known under the designation of “common prickers,” and, like Hopkins, received a fee for each witch they discovered. At the trial of Janet Peaston, in 1646, the magistrates of Dalkeith “caused John Kincaid of Tranent, the common pricker, to exercise his craft upon her. He

found two marks of the devil's making; for she could not feel the pin when it was put into either of the said marks, nor did the marks bleed when the pin was taken out again. When she was asked where she thought the pins were put in her, she pointed to a part of her body distant from the real place. They were pins of three inches in length.”³³

These common prickers became at last so numerous that they were considered nuisances. The judges refused to take their evidence; and in 1678 the privy council of Scotland condescended to hear the complaint of an honest woman who had been indecently exposed by one of them, and expressed their opinion that common prickers were common cheats.

But such an opinion was not formed in high places before hundreds of innocent persons had fallen victims. The parliaments had encouraged the delusion both in England and Scotland; and by arming these fellows with a sort of authority, had in a manner forced the magistrates and ministers to receive their evidence. The fate of one poor old gentleman, who fell a victim to the arts of Hopkins in 1646, deserves to be recorded. Mr. Louis, a venerable clergyman, upwards of seventy years of age, and who had been rector of Framlingham, in Suffolk, for fifty years, excited suspicion that he was a wizard. Being a violent royalist, he was likely to meet with no sympathy at that time; and even his own parishioners, whom he had served so long and so faithfully, turned their backs upon him as soon as he was accused. Placed under the hands of Hopkins, who knew so well how to bring the refractory to confession, the old man, the light of whose intellect had become somewhat dimmed from age, confessed that he was a wizard. He said he had two imps that

continually excited him to do evil; and that one day, when he was walking on the sea-coast, one of them prompted him to express a wish that a ship, whose sails were just visible in the distance, might sink. He consented, and saw the vessel sink before his eyes. He was, upon this confession, tried and condemned. On his trial, the flame of reason burned up as brightly as ever. He denied all that had been alleged against him, and cross-examined Hopkins with great tact and severity. After his condemnation, he begged that the funeral service of the Church might be read for him. The request was refused, and he repeated it for himself from memory as he was led to the scaffold.

A poor woman in Scotland was executed upon evidence even less strong than this. John Bain, a common pricker, swore that, as he passed her door, he heard her talking to the devil. She said, in defence, that it was a foolish practice she had of talking to herself, and several of her neighbours corroborated her statement; but the evidence of the pricker was received. He swore that none ever talked to themselves who were not witches. The devil's mark being found upon her, the additional testimony of her guilt was deemed conclusive, and she was "convict and brynt."

From the year 1652 to 1682, these trials diminished annually in number, and acquittals were by no means so rare as they had been. To doubt in witchcraft was no longer dangerous. Before country justices, condemnations on the most absurd evidence still continued; but when the judges of the land had to charge the jury, they took a more humane and philosophical view. By degrees, the educated classes (comprised in those days within very narrow limits) openly expressed their unbelief of modern witchcraft, although they were not bold enough to deny its existence altogether. Between them and

the believers in the old doctrine fierce arguments ensued, and the sceptics were designated Sadducees. To convince them, the learned and Reverend Joseph Glanvil wrote his well-known work, *Sadducismus Triumphatus*, and *The Collection of Relations*; the first part intended as a philosophical inquiry into witchcraft, and the power of the devil “to assume a mortal shape:” the latter containing what he considered a multitude of well-authenticated modern instances.



SIR MATTHEW HALE.

But though progress was made, it was slow. In 1664, the venerable Sir Matthew Hale condemned two women, named Amy Duny and Rose Cullender, to the stake at St. Edmondsbury, upon evidence the most ridiculous. These two old women, whose ugliness gave their neighbours the first idea that they were witches, went to a shop to purchase herrings, and were refused. Indignant at the prejudice against them, they were not sparing of their abuse. Shortly afterward, the daughter of the herring-dealer fell sick, and a cry was raised that she was bewitched by the old women who had been refused the herrings. This girl was subject to epileptic fits. To discover the guilt of Amy Duny and Rose Cullender, the girl's eyes were blinded closely with a shawl, and the witches were commanded to touch her. They

did so, and she was immediately seized with a fit. Upon this evidence they were sent to prison. The girl was afterwards touched by an indifferent person, and the force of her imagination was so great, that, thinking it was again the witches, she fell down in a violent fit as before. This, however, was not received in favour of the accused.

The following extract, from the published reports of the trial, will shew the sort of evidence which was received:

“Samuel Pacey, of Leystoff (a good, sober man), being sworn, said that, on Thursday the 10th of October last, his younger daughter, Deborah, about nine years old, was suddenly taken so lame that she could not stand on her legs, and so continued till the 17th of the same month, when the child desired to be carried to a bank on the east side of the house, looking towards the sea; and, while she was sitting there, Amy Duny came to this examinant’s house to buy some herrings, but was denied. Then she came twice more, but, being as often denied, she went away discontented and grumbling. At this instant of time, the child was taken with terrible fits, complaining of a pain in her stomach, as if she was pricked with pins, shrieking out with a voice like a whelp, and thus continued till the 30th of the same month. This examinant further saith, that Amy Duny, having long had the reputation of a witch, and his child having, in the intervals of her fits, constantly cried out on her as the cause of her disorder, saying, that the said Amy did appear to her and fright her; he himself did suspect the said Amy to be a witch, and charged her with being the cause of his child’s illness, and set her in the stocks. Two days after, his daughter Elizabeth was taken with such strange fits, that they could not force open her

mouth without a tap; and the younger child being in the same condition, they used to her the same remedy. Both children grievously complained that Amy Duny and another woman, whose habit and looks they described, did appear to them and torment them, and would cry out, 'There stands Amy Duny! There stands Rose Cullender!' the other person who afflicted them. Their fits were not alike. Sometimes they were lame on the right side; sometimes on the left; and sometimes so sore, that they could not bear to be touched. Sometimes they were perfectly well in other respects, but they could not *hear*; at other times they could not *see*. Sometimes they lost their speech for one, two, and once for eight days together. At times they had swooning fits, and, when they could speak, were taken with a fit of coughing, and vomited phlegm and crooked pins; and once a great twopenny nail, with above forty pins; which nail he, the examinant, saw vomited up, with many of the pins. The nail and pins were produced in the court. Thus the children continued for two months, during which time the examinant often made them read in the New Testament, and observed, when they came to the words *Lord Jesus*, or *Christ*, they could not pronounce them, but fell into a fit. When they came to the word *Satan*, or *devil*, they would point, and say, 'This bites, but makes me speak right well.' Finding his children thus tormented without hopes of recovery, he sent them to his sister, Margaret Arnold, at Yarmouth, being willing to try whether change of air would help them.

“Margaret Arnold was the next witness. Being sworn, she said, that about the 30th of November, Elizabeth and Deborah Pacey

came to her house, with her brother, who told her what had happened, and that he thought his children bewitched. She, this examinant, did not much regard it, supposing the children had played tricks, and put the pins into their mouths themselves. She therefore took all the pins from their clothes, sewing them with thread instead of pinning them. But, notwithstanding, they raised, at times, at least thirty pins in her presence, and had terrible fits; in which fits they would cry out upon Amy Duny and Rose Cullender, saying, that they saw them and heard them threatening, as before; that they saw things like mice running about the house; and one of them caught one, and threw it into the fire, which made a noise like a rat. Another time the younger child, being out of doors, a thing like a bee would have forced itself into her mouth, at which the child ran screaming into the house, and before this examinant could come at her, fell into a fit, and vomited a twopenny nail, with a broad head. After that, this examinant asked the child how she came by this nail, when she answered, 'The bee brought the nail, and forced it into my mouth.' At other times, the eldest child told this examinant that she saw flies bring her crooked pins. She would then fall into a fit, and vomit such pins. One time the said child said she saw a mouse, and crept under the table to look for it; and afterwards, the child seemed to put something into her apron, saying, 'She had caught it.' She then ran to the fire, and threw it in, on which there did appear to this examinant something like a flash of gunpowder, although she does own she saw nothing in the child's hand. Once the child, being speechless, but otherwise very sensible, ran up and down the house, crying, 'Hush! hush!'

as if she had seen poultry; but this examinant saw nothing. At last the child caught at something, and threw it into the fire. Afterwards, when the child could speak, this examinant asked her what she saw at the time? She answered that she saw a duck. Another time the youngest child said, after a fit, that Amy Duny had been with her, and tempted her to drown herself, or cut her throat, or otherwise destroy herself. Another time they both cried out upon Amy Duny and Rose Cullender, saying, ‘Why don’t you come yourselves? Why do you send your imps to torment us?’”



SIR THOMAS BROWN.

The celebrated Sir Thomas Brown, the author of *Vulgar Errors*, was also examined as a witness upon the trial. Being desired to give his opinion of the three persons in court, he said he was clearly of opinion that they were bewitched. He said there had lately been a discovery of witches in Denmark, who used the same way of tormenting persons, by conveying crooked pins, needles, and nails into their bodies. That he thought, in such cases, the devil acted upon human bodies by natural means, namely, by exciting and stirring up the superabundant humours; he did afflict them in a more surprising manner by the same diseases their bodies were usually subject to;

that these fits might be natural, only raised to a great degree by the subtlety of the devil, co-operating with the malice of these witches.

The evidence being concluded, Sir Matthew Hale addressed the jury. He said, he would waive repeating the evidence, to prevent any mistake, and told the jury there were two things they had to inquire into. First, Whether or not these children were bewitched; secondly, Whether these women did bewitch them. He said, he did not in the least doubt there were witches; first, Because the Scriptures affirmed it; secondly, Because the wisdom of all nations, particularly our own, had provided laws against witchcraft, which implied their belief of such a crime. He desired them strictly to observe the evidence, and begged of God to direct their hearts in the weighty concern they had in hand, since, to condemn the innocent and let the guilty go free are both an abomination to the Lord.

The jury then retired, and in about half an hour returned a verdict of guilty upon all the indictments, being thirteen in number. The next morning the children came with their father to the lodgings of Sir Matthew Hale, very well, and quite restored to their usual health. Mr. Pacey, being asked at what time their health began to improve, replied, that they were quite well in half an hour after the conviction of the prisoners.

Many attempts were made to induce the unfortunate women to confess their guilt; but in vain, and they were both hanged.

Eleven trials were instituted before Chief Justice Holt for witchcraft, between the years 1694 and 1701. The evidence was of the usual character; but Holt appealed so successfully in each case to the common sense of the jury, that they were every one acquitted. A general feeling seemed to pervade the country that blood enough had

been shed upon these absurd charges. Now and then, the flame of persecution burnt up in a remote district; but these instances were no longer looked upon as mere matters of course. They appear, on the contrary, to have excited much attention; a sure proof, if no other were to be obtained, that they were becoming unfrequent.

A case of witchcraft was tried in 1711, before Lord Chief Justice Powell; in which, however, the jury persisted in a verdict of guilty, though the evidence was of the usual absurd and contradictory character, and the enlightened judge did all in his power to bring them to a right conclusion. The accused person was one Jane Wenham, better known as the Witch of Walkerne; and the persons who were alleged to have suffered from her witchcraft were two young women, named Thorne and Street. A witness, named Mr. Arthur Chauncy, deposed, that he had seen Ann Thorne in several of her fits, and that she always recovered upon prayers being said, or if Jane Wenham came to her. He related, that he had pricked the prisoner several times in the arms, but could never fetch any blood from her; that he had seen her vomit pins, when there were none in her clothes or within her reach; and that he had preserved several of them, which he was ready to produce. The judge, however, told him that was needless, *as he supposed they were crooked pins*.

Mr. Francis Bragge, another witness, deposed, that strange “cakes” of bewitched feathers having been taken from Ann Thorne’s pillow, he was anxious to see them. He went into a room where some of these feathers were, and took two of the cakes, and compared them together. They were both of a circular figure, something larger than a crown piece; and he observed that the small feathers were placed in a nice and curious order, at equal distances from each other, making

so many radii of the circle, in the centre of which the quill-ends of the feathers met. He counted the number of these feathers, and found them to be exactly thirty-two in each cake. He afterwards endeavoured to pull off two or three of them, and observed that they were all fastened together by a sort of viscous matter, which would stretch seven or eight times in a thread before it broke. Having taken off several of these feathers, he removed the viscous matter with his fingers, and found under it, in the centre, some short hairs, black and grey, matted together, which he verily believed to be cat's hair. He also said, that Jane Wenham confessed to him that she had bewitched the pillow, and had practised witchcraft for sixteen years.

The judge interrupted the witness at this stage, and said, he should very much like to see an enchanted feather, and seemed to wonder when he was told that none of these strange cakes had been preserved. His lordship asked the witness why he did not keep one or two of them, and was informed that they had all been burnt, in order to relieve the bewitched person of the pains she suffered, which could not be so well effected by any other means.

A man, named Thomas Ireland, deposed, that hearing several times a great noise of cats crying and screaming about his house, he went out and frightened them away, and they all ran towards the cottage of Jane Wenham. One of them he swore positively had a face very like Jane Wenham's. Another man, named Burville, gave similar evidence, and swore that he had often seen a cat with Jane Wenham's face. Upon one occasion he was in Ann Thorne's chamber, when several cats came in, and among them the cat above stated. This witness would have favoured the court with a much longer

statement, but was stopped by the judge, who said he had heard quite enough.

The prisoner, in her defence, said nothing, but that “she was a clear woman.” The learned judge then summed up, leaving it to the jury to determine whether such evidence as they had heard was sufficient to take away the prisoner’s life upon the indictment. After a long deliberation they brought in their verdict, that she was guilty upon the evidence. The judge then asked them whether they found her guilty upon the indictment of conversing with the devil in the shape of a cat? The sapient foreman very gravely answered, “We find her guilty of *that*.” The learned judge then very reluctantly proceeded to pass sentence of death; but, by his persevering exertions, a pardon was at last obtained, and the wretched old woman was set at liberty.

In the year 1716, a woman and her daughter—the latter only nine years of age—were hanged at Huntingdon for selling their souls to the devil, and raising a storm by pulling off their stockings and making a lather of soap. This appears to have been the last judicial execution in England. From that time to the year 1736, the populace raised at intervals the old cry, and more than once endangered the lives of poor women by dragging them through ponds on suspicion; but the philosophy of those who, from their position, sooner or later give the tone to the opinions and morals of the poor, was silently working a cure for the evil. The fear of witches ceased to be epidemic, and became individual, lingering only in minds fettered by inveterate prejudice or brutalising superstition. In the year 1736, the penal statute of James I. was finally blotted from the statute-book, and suffered no longer to disgrace the advancing intelligence of the country. Pretenders to witchcraft, fortune-tellers, conjurors, and all

their train, were liable only to the common punishment of rogues and impostors—imprisonment and the pillory.

In Scotland, the delusion also assumed the same phases, and was gradually extinguished in the light of civilisation. As in England, the progress of improvement was slow. Up to the year 1665, little or no diminution of the mania was perceptible. In 1643, the General Assembly recommended that the privy council should institute a standing commission, composed of any “understanding gentlemen or magistrates,” to try the witches, who were stated to have increased enormously of late years. In 1649, an act was passed, confirmatory of the original statute of Queen Mary, explaining some points of the latter which were doubtful, and enacting severe penalties, not only against witches themselves, but against all who covenanted with them, or sought by their means to pry into the secrets of futurity, or cause any evil to the life, lands, or limbs of their neighbours. For the next ten years, the popular madness upon this subject was perhaps more furious than ever; upwards of four thousand persons suffered for the crime during that interval. This was the consequence of the act of parliament and the unparalleled severity of the magistrates; the latter frequently complained that for two witches they burned one day, there were ten to burn the next: they never thought that they themselves were the cause of the increase. In a single circuit, held at Glasgow, Ayr, and Stirling, in 1659, seventeen unhappy creatures were burned by judicial sentence for trafficking with Satan. In one day (November 7, 1661), the privy council issued no less than fourteen commissions for trials in the provinces. Next year, the violence of the persecution seems to have abated. From 1662 to 1668, although “the understanding gentlemen and magistrates” already

mentioned, continued to try and condemn, the High Court of Justiciary had but one offender of this class to deal with, and she was acquitted. James Welsh, a common pricker, was ordered to be publicly whipped through the streets of Edinburgh for falsely accusing a woman of witchcraft; a fact which alone proves that the superior court sifted the evidence in these cases with much more care and severity than it had done a few years previously. The enlightened Sir George Mackenzie, styled by Dryden "the noble wit of Scotland," laboured hard to introduce this rule into court, that the confessions of the witches should be held of little worth, and that the evidence of the prickers and other interested persons should be received with distrust and jealousy. This was reversing the old practice, and saved many innocent lives. Though a firm believer both in ancient and modern witchcraft, he could not shut his eyes to the atrocities daily committed under the name of justice. In his work on the Criminal Law of Scotland, published in 1678, he says, "From the horridness of this crime, I do conclude that, of all others, it requires the clearest relevancy and most convincing probature; and I condemn, next to the witches themselves, those cruel and too forward judges who burn persons by thousands as guilty of this crime." In the same year, Sir John Clerk plumply refused to serve as a commissioner on trials for witchcraft, alleging, by way of excuse, "that he was not himself good conjuror enough to be duly qualified." The views entertained by Sir George Mackenzie were so favourably received by the Lords of Session, that he was deputed, in 1680, to report to them on the cases of a number of poor women who were then in prison awaiting their trial. Sir George stated that there was no evidence against them whatever but their own confessions, which

were absurd and contradictory, and drawn from them by severe torture. They were immediately discharged.

For the next sixteen years the Lords of Session were unoccupied with trials for witchcraft. Not one is entered upon the record. But in 1697 a case occurred which equalled in absurdity any of those that signalled the dark reign of King James. A girl named Christiana Shaw, eleven years of age, the daughter of John Shaw of Bargarran, was subject to fits; and being of a spiteful temper, she accused her maid-servant, with whom she had frequent quarrels, of bewitching her. Her story unfortunately was believed. Encouraged to tell all the persecutions of the devil which the maid had sent to torment her, she in the end concocted a romance that involved twenty-one persons. There was no other evidence against them but the fancies of this lying child, and the confessions which pain had extorted from them; but upon this no less than five women were condemned before Lord Blantyre and the rest of the commissioners, appointed specially by the privy council to try this case. They were burned on the Green at Paisley. The warlock of the party, one John Reed, who was also condemned, hanged himself in prison. It was the general belief in Paisley that the devil had strangled him lest he should have revealed in his last moments too many of the unholy secrets of witchcraft. This trial excited considerable disgust in Scotland. The Rev. Mr. Bell, a contemporary writer, observed that, in this business, “persons of more goodness and esteem than most of their calumniators were defamed for witches.” He adds, that the persons chiefly to blame were “certain ministers of too much forwardness and absurd credulity, and some topping professors in and about Glasgow.”³⁴

After this trial, there again occurs a lapse of seven years, when the subject was painfully forced upon public attention by the brutal cruelty of the mob at Pittenween. Two women were accused of having bewitched a strolling beggar who was subject to fits, or who pretended to be so, for the purpose of exciting commiseration. They were cast into prison, and tortured until they confessed. One of them, named Janet Cornfoot, contrived to escape, but was brought back to Pittenween next day by a party of soldiers. On her approach to the town she was unfortunately met by a furious mob, composed principally of fishermen and their wives, who seized upon her with the intention of swimming her. They forced her away to the sea-shore, and tying a rope around her body, secured the end of it to the mast of a fishing-boat lying alongside. In this manner they ducked her several times. When she was half dead, a sailor in the boat cut away the rope, and the mob dragged her through the sea to the beach. Here, as she lay quite insensible, a brawny ruffian took down the door of his hut, close by, and placed it on her back. The mob gathered large stones from the beach and piled them upon her till the wretched woman was pressed to death. No magistrate made the slightest attempt to interfere; and the soldiers looked on, delighted spectators. A great outcry was raised against this culpable remissness, but no judicial inquiry was set on foot. This happened in 1704.

The next case we hear of is that of Elspeth Rule, found guilty of witchcraft before Lord Anstruther, at the Dumfries circuit, in 1708. She was sentenced to be marked in the cheek with a red-hot iron, and banished the realm of Scotland for life.

Again there is a long interval. In 1718, the remote county of Caithness, where the delusion remained in all its pristine vigour for years after it had ceased elsewhere, was startled from its propriety by the cry of witchcraft. A silly fellow, named William Montgomery, a carpenter, had a mortal antipathy to cats; and somehow or other these animals generally chose his back-yard as the scene of their catterwaulings. He puzzled his brains for a long time to know why he, above all his neighbours, should be so pestered. At last he came to the sage conclusion that his tormentors were no cats, but witches. In this opinion he was supported by his maid-servant, who swore a round oath that she had often heard the aforesaid cats talking together in human voices. The next time the unlucky tabbies assembled in his back-yard, the valiant carpenter was on the alert. Arming himself with an axe, a dirk, and a broadsword, he rushed out among them. One of them he wounded in the back, a second in the hip, and the leg of a third he maimed with his axe; but he could not capture any of them. A few days afterwards, two old women of the parish died; and it was said, that when their bodies were laid out, there appeared upon the back of one the mark as of a recent wound, and a similar scar upon the hip of the other. The carpenter and his maid were convinced that they were the very cats, and the whole county repeated the same story. Every one was upon the look-out for proofs corroborative; a very remarkable one was soon discovered. Nanny Gilbert, a wretched old creature of upwards of seventy years of age, was found in bed with her leg broken. As she was ugly enough for a witch, it was asserted that she also was one of the cats that had fared so ill at the hands of the carpenter. The latter, when informed of the popular suspicion, asserted that he distinctly remembered to

have struck one of the cats a blow with the back of his broadsword, which ought to have broken her leg. Nanny was immediately dragged from her bed and thrown into prison. Before she was put to the torture, she explained in a very natural and intelligible manner how she had broken her limb; but this account did not give satisfaction. The professional persuasions of the torturer made her tell a different tale, and she confessed that she was indeed a witch, and had been wounded by Montgomery on the night stated; that the two old women recently deceased were witches also, besides about a score of others whom she named. The poor creature suffered so much by the removal from her own home, and the tortures inflicted upon her, that she died the next day in prison. Happily for the persons she had named in her confession, Dundas of Arniston, at that time the king's advocate-general, wrote to the sheriff-depute, one Captain Ross of Littledean, cautioning him not to proceed to trial, the "thing being of too great difficulty, and beyond the jurisdiction of an inferior court." Dundas himself examined the precognition with great care, and was so convinced of the utter folly of the whole case, that he quashed all further proceedings.

We find this same sheriff-depute of Caithness very active four years afterwards in another trial for witchcraft. In spite of the warning he had received that all such cases were to be tried in future by the superior courts, he condemned to death an old woman at Dornoch, upon the charge of bewitching the cows and pigs of her neighbours. This poor creature was insane, and actually laughed and clapped her hands at sight of "the bonnie fire" that was to consume her. She had a daughter who was lame both of her hands and feet, and one of the charges brought against her was, that she had used

this daughter as a pony in her excursions to join the devil's sabbath, and that the devil himself had shod her, and produced lameness.

This was the last execution that took place in Scotland for witchcraft. The penal statutes were repealed in 1736; and, as in England, whipping, the pillory, or imprisonment, were declared the future punishments of all pretenders to magic or witchcraft.

Still for many years after this the superstition lingered both in England and Scotland, and in some districts is far from being extinct even at this day. But before we proceed to trace it any further than to its legal extinction, we have yet to see the frightful havoc it made in continental Europe from the commencement of the seventeenth to the middle of the eighteenth century. France, Germany, and Switzerland were the countries which suffered most from the epidemic. The number of victims in these countries during the sixteenth century has already been mentioned; but at the early part of the seventeenth, the numbers are so great, especially in Germany, that were they not to be found in the official records of the tribunals, it would be almost impossible to believe that mankind could ever have been so maddened and deluded. To use the words of the learned and indefatigable Horst,³⁵ "the world seemed to be like a large madhouse for witches and devils to play their antics in." Satan was believed to be at every body's call to raise the whirlwind, draw down the lightning, blight the productions of the earth, or destroy the health and paralyse the limbs of man. This belief, so insulting to the majesty and beneficence of the Creator, was shared by the most pious ministers of religion. Those who in their morning and evening prayers acknowledged the one true God, and praised him for the blessings of the seed-time and the harvest, were convinced that frail

humanity could enter into a compact with the spirits of hell to subvert his laws and thwart all his merciful intentions. Successive popes, from Innocent VIII. downwards, promulgated this degrading doctrine, which spread so rapidly, that society seemed to be divided into two great factions, the bewitching and the bewitched.

The commissioners named by Innocent VIII. to prosecute the witch-trials in Germany were, Jacob Sprenger, so notorious for his work on demonology, entitled the *Malleus Maleficarum, or Hammer to knock down Witches*; Henry Institor, a learned jurisconsult; and the Bishop of Strasburgh. Bamberg, Trèves, Cologne, Paderborn, and Würzburg, were the chief seats of the commissioners, who, during their lives alone, condemned to the stake, on a very moderate calculation, upwards of three thousand victims. The number of witches so increased, that new commissioners were continually appointed in Germany, France, and Switzerland. In Spain and Portugal the Inquisition alone took cognisance of the crime. It is impossible to search the records of those dark, but now happily non-existing tribunals; but the mind recoils with affright even to form a guess of the multitudes who perished.

The mode of trial in the other countries is more easily ascertained. Sprenger in Germany, and Bodinus and Delrio in France, have left but too ample a record of the atrocities committed in the much-abused names of justice and religion. Bodinus, of great repute and authority in the seventeenth century, says, "The trial of this offence must not be conducted like other crimes. Whoever adheres to the ordinary course of justice perverts the spirit of the law, both divine and human. He who is accused of sorcery should never be acquitted, unless the malice of the prosecutor be clearer than the sun; for it is

so difficult to bring full proof of this secret crime, that out of a million of witches not one would be convicted if the usual course were followed!” Henri Boguet, a witch-finder, who styled himself “The Grand Judge of Witches for the Territory of St. Claude,” drew up a code for the guidance of all persons engaged in the witch-trials, consisting of seventy articles, quite as cruel as the code of Bodinus. In this document he affirms, that a mere suspicion of witchcraft justifies the immediate arrest and torture of the suspected person. If the prisoner muttered, looked on the ground, and did not shed any tears, all these were proofs positive of guilt! In all cases of witchcraft, the evidence of the child ought to be taken against its parent; and persons of notoriously bad character, although not to be believed upon their oaths on the ordinary occasions of dispute that might arise between man and man, were to be believed, if they swore that any person had bewitched them! Who, when he hears that this diabolical doctrine was the universally received opinion of the ecclesiastical and civil authorities, can wonder that thousands upon thousands of unhappy persons should be brought to the stake? that Cologne should for many years burn its three hundred witches annually? the district of Bamberg its four hundred? Nuremberg, Geneva, Paris, Toulouse, Lyons, and other cities, their two hundred?

A few of these trials may be cited, taking them in the order of priority, as they occurred in different parts of the Continent. In 1595, an old woman residing in a village near Constance, angry at not being invited to share the sports of the country people on a day of public rejoicing, was heard to mutter something to herself, and was afterwards seen to proceed through the fields towards a hill, where she was lost sight of. A violent thunder-storm arose about two hours

afterwards, which wet the dancers to the skin, and did considerable damage to the plantations. This woman, suspected before of witchcraft, was seized and imprisoned, and accused of having raised the storm, by filling a hole with wine, and stirring it about with a stick. She was tortured till she confessed, and was burned alive the next evening.



CITY OF LYONS.

About the same time two sorcerers in Toulouse were accused of having dragged a crucifix about the streets at midnight, stopping at times to spit upon and kick it, and uttering at intervals an exorcism to raise the devil. The next day a hail-storm did considerable damage to the crops; and a girl, the daughter of a shoemaker in the town, remembered to have heard in the night the execrations of the wizards. Her story led to their arrest. The usual means to produce confession were resorted to. The wizards owned that they could raise tempests whenever they pleased, and named several persons who possessed similar powers. They were hanged, and then burned in the market-place, and seven of the persons they had mentioned shared the same fate.

Hoppo and Stadlin, two noted wizards of Germany, were executed in 1599. They implicated twenty or thirty witches, who went about causing women to miscarry, bringing down the lightning of heaven, and making maidens bring forth toads. To this latter fact several girls were found to swear most positively! Stadlin confessed that he had killed seven infants in the womb of one woman.

Bodinus highly praises the exertions of a witch-finder named Nider, in France, who prosecuted so many that he could not calculate them. Some of these witches could, by a single word, cause people to fall down dead; others made women go with child three years instead of nine months; while others, by certain invocations and ceremonies, could turn the faces of their enemies upside down, or twist them round to their backs. Although no witness was ever procured who saw persons in this horrible state, the witches confessed that they had the power and exercised it. Nothing more was wanting to ensure the stake.

At Amsterdam a crazy girl confessed that she could cause sterility in cattle, and bewitch pigs and poultry by merely repeating the magic words *Turius und Shurius Inturius!* She was hanged and burned. Another woman in the same city, named Kornelis van Purmerund, was arrested in consequence of some disclosures the former had made. A witness came forward and swore that she one day looked through the window of her hut, and saw Kornelis sitting before a fire muttering something to the devil. She was sure it was to the devil, because she heard him answer her. Shortly afterwards twelve black cats ascended out of the floor, and danced on their hind legs around the witch for the space of about half an hour. They then vanished

with a horrid noise, and leaving a disagreeable smell behind them. She also was hanged and burned.

At Bamberg, in Bavaria, the executions from the year 1610 to 1640 were at the rate of about a hundred annually. One woman, suspected of witchcraft, was seized because, having immoderately praised the beauty of a child, it had shortly afterwards fallen ill and died. She confessed upon the rack that the devil had given her the power to work evil upon those she hated, by speaking words in their praise. If she said with unwonted fervour, "What a strong man!" "What a lovely woman!" "What a sweet child!" the devil understood her, and afflicted them with diseases immediately. It is quite unnecessary to state the end of this poor creature. Many women were executed for causing strange substances to lodge in the bodies of those who offended them. Bits of wood, nails, hair, egg-shells, bits of glass, shreds of linen and woollen cloth, pebbles, and even hot cinders and knives, were the articles generally chosen. These were believed to remain in the body till the witches confessed or were executed, when they were voided from the bowels, or by the mouth, nostrils, or ears. Modern physicians have often had cases of a similar description under their care, where girls have swallowed needles, which have been voided on the arms, legs, and other parts of the body. But the science of that day could not account for these phenomena otherwise than by the power of the devil; and every needle swallowed by a servant-maid cost an old woman her life. Nay, if no more than one suffered in consequence, the district might think itself fortunate. The commissioners seldom stopped short at one victim. The revelations of the rack in most cases implicated half a score.



BAMBERG.

Of all the records of the witch-trials preserved for the wonder of succeeding ages, that of Würzburg, from 1627 to 1629, is the most frightful. Hauber, who has preserved this list in his *Acta et Scripta Magica*, says, in a note at the end, that it is far from complete, and that there were a great many other burnings too numerous to specify. This record, which relates to the city only, and not to the province of Würzburg, contains the names of one hundred and fifty-seven persons who were burned in two years in twenty-nine burnings, averaging from five to six at a time. The list comprises three play-actors, four innkeepers, three common councilmen of Würzburg, fourteen vicars of the cathedral, the burgomaster's lady, an apothecary's wife and daughter, two choristers of the cathedral, Göbel Babelin, the prettiest girl in the town, and the wife, the two little sons and the daughter of the councillor Stolzenberg. Rich and poor, young and old, suffered alike. At the seventh of these recorded burnings, the victims are described as a wandering boy, twelve years of age, and four strange men and women found sleeping in the

market-place. Thirty-two of the whole number appear to have been vagrants, of both sexes, who, failing to give a satisfactory account of themselves, were accused and found guilty of witchcraft. The number of children on the list is horrible to think upon. The thirteenth and fourteenth burnings comprised four persons, who are stated to have been a little maiden nine years of age, a maiden still less, her sister, their mother, and their aunt, a pretty young woman of twenty-four. At the eighteenth burning the victims were two boys of twelve, and a girl of fifteen; at the nineteenth, the young heir of the noble house of Rotenhahn, aged nine, and two other boys, one aged ten, and the other twelve. Among other entries appear the names of Baunach, the fattest, and Steinacher, the richest burgher in Würzburg. What tended to keep up the delusion in this unhappy city, and, indeed, all over Europe, was the number of hypochondriac and diseased persons who came voluntarily forward and made confession of witchcraft. Several of the victims in the foregoing list had only themselves to blame for their fate. Many again, including the apothecary's wife and daughter already mentioned, pretended to sorcery, and sold poisons, or attempted by means of charms and incantations to raise the devil. But throughout all this fearful period the delusion of the criminals was as great as that of the judges. Depraved persons who in ordinary times would have been thieves or murderers, added the desire of sorcery to their depravity, sometimes with the hope of acquiring power over their fellows, and sometimes with the hope of securing impunity in this world by the protection of Satan. One of the persons executed at the first burning, a prostitute, was heard repeating the exorcism which was supposed to have the power of raising the arch enemy in the form of a goat. This precious

specimen of human folly has been preserved by Horst in his *Zauberbibliothek*. It ran as follows, and was to be repeated slowly, with many ceremonies and wavings of the hand:

“Lalle, Bachera, Magotte, Baphia, Dajam,
Vagoth Heneche Ammi Nagaz, Adomator
Raphael Immanuel Christus, Tetragrammaton
Agra Jod Loi. König! König!”

The two last words were uttered quickly, and with a sort of scream, and were supposed to be highly agreeable to Satan, who loved to be called a king. If he did not appear immediately, it was necessary to repeat a further exorcism. The one in greatest repute was as follows, and was to be read backwards, with the exception of the last two words:

“Anion, Lalle, Sabolos, Sado, Pater, Aziel
Adonai Sado Vagoth Agra, Jod,
Baphra! Komm! Komm!”

When the witch wanted to get rid of the devil, who was sometimes in the habit of prolonging his visits to an unconscionable length, she had only to repeat the following, also backwards, when he generally disappeared, leaving behind him a suffocating smell:

“Zellianelle Heotti Bonus Vagotha
Plisos sother oseh unicus Beelzebub

Dax! Komm! Komm!”

This nonsensical jargon soon became known to all the idle and foolish boys of Germany. Many an unhappy urchin, who in a youthful frolic had repeated it, paid for his folly the penalty of his life. Three, whose ages varied from ten to fifteen, were burned alive at Würzburg for no other offence. Of course every other boy in the city became still more convinced of the power of the charm. One boy confessed that he would willingly have sold himself to the devil, if he could have raised him, for a good dinner and cakes every day of his life, and a pony to ride upon. This luxurious youngster, instead of being horsewhipped for his folly, was hanged and burned.

The small district of Lindheim was, if possible, even more notorious than Würzburg for the number of its witch-burnings. In the year 1633 a famous witch, named Pomp Anna, who could cause her foes to fall sick by merely looking at them, was discovered and burned, along with three of her companions. Every year in this parish, consisting at most of a thousand persons, the average number of executions was five. Between the years 1660 and 1664, the number consumed was thirty. If the executions all over Germany had been in this frightful proportion, hardly a family could have escaped losing one of its members.

In 1627, a ballad entitled the *Druten Zeitung*, or the *Witches' Gazette*, was very popular in Germany. It detailed, according to the title-page of a copy printed at Smalcald in 1627, “An account of the remarkable events which took place in Franconia, Bamberg, and Würzburg, with those wretches who from avarice or ambition have sold themselves to the devil, and how they had their reward at last:

set to music, and to be sung to the tune of Dorothea.” The sufferings of the witches at the stake are explained in it with great minuteness, the poet waxing extremely witty when he describes the horrible contortions of pain upon their countenances, and the shrieks that rent the air when any one of more than common guilt was burned alive. A trick resorted to in order to force one witch to confess, is told in this doggrel as an excellent joke. As she obstinately refused to own that she was in league with the powers of evil, the commissioners suggested that the hangman should dress himself in a bear’s skin, with the horns, tail, and all the et-ceteras, and in this form penetrate into her dungeon. The woman, in the darkness of her cell, could not detect the imposture, aided as it was by her own superstitious fears. She thought she was actually in the presence of the prince of hell; and when she was told to keep up her courage, and that she should be relieved from the power of her enemies, she fell on her knees before the supposed devil, and swore to dedicate herself hereafter, body and soul, to his service. Germany is, perhaps, the only country in Europe where the delusion was so great as to have made such detestable verses as these the favourites of the people:

“Man shickt ein Henkersknecht
Zu ihr in Gefängniss n’unter,
Den man hat kleidet recht,
Mit einer Bärnhaute,
Als wenns der Teufel wär;
Als ihm die Drut anschaute
Meints ihr Buhl kam daher.

Sie sprach zu ihm behende,
Wie lässt du mich so lang
In der Obrigkeit Hände?
Hilf mir aus ihren Zwang,
Wie du mir hast verheissen,
Ich bin ja eben dein,
Thu mich aus der Angst entreissen
O liebster Buhle mein!”³⁶

This rare poet adds, that in making such an appeal to the hangman, the witch never imagined the roast that was to be made of her, and puts in, by way of parenthesis, “was not that fine fun!—*was das war für ein Spiel!*” As feathers thrown into the air shew how the wind blows, so this trumpery ballad serves to shew the current of popular feeling at the time of its composition.

All readers of history are familiar with the celebrated trial of the Maréchale d’Ancre, who was executed in Paris in the year 1617. Although witchcraft was one of the accusations brought against her, the real crime for which she suffered was her ascendancy over the mind of Mary of Medicis, and the consequent influence she exercised indirectly over the unworthy king, Louis XIII. Her coachman gave evidence that she had sacrificed a cock at midnight in one of the churches, and others swore they had seen her go secretly into the house of a noted witch named Isabella. When asked by what means she had acquired so extraordinary an influence over the mind of the Queen Mother, she replied boldly that she exercised no other power over her than that which a strong mind can always exercise over the weak. She died with great firmness.

In two years afterwards, scenes far more horrible than any that had yet taken place in France were enacted at Labourt, at the foot of the Pyrenees. The parliament of Bourdeaux, scandalised at the number of witches who were said to infest Labourt and its neighbourhood, deputed one of its own members, the noted Pierre de l'Ancre, and its president, Espaignel, to inquire into the matter, with full powers to punish the offenders. They arrived at Labourt in May, 1619. De l'Ancre wrote a book setting forth all his great deeds in this battle against the powers of evil. It is full of obscenity and absurdity, but the facts may be relied on as far as they relate to the number of trials and executions, and the strange confessions which torture forced from the unhappy criminals.

De l'Ancre states as a reason why so many witches were to be found at Labourt, that the country was mountainous and sterile! He discovered many of them from their partiality to smoking tobacco. It may be inferred from this that he was of the opinion of King James, that tobacco was the "devil's weed." When the commission first sat, the number of persons brought to trial was about forty a day. The acquittals did not average so many as five per cent. All the witches confessed that they had been present at the great Domdaniel, or Sabbath. At these saturnalia the devil sat upon a large gilded throne, sometimes in the form of a goat; sometimes as a gentleman, dressed all in black, with boots, spurs, and sword; and very often as a shapeless mass, resembling the trunk of a blasted tree, seen indistinctly amid the darkness. They generally proceeded to the Domdaniel, riding on spits, pitchforks, or broomsticks, and on their arrival indulged with the fiends in every species of debauchery. Upon one occasion they had had the audacity to celebrate this festival in

the very heart of the city of Bourdeaux. The throne of the arch fiend was placed in the middle of the Place de Gallienne, and the whole space was covered with the multitude of witches and wizards who flocked to it from far and near, some arriving even from distant Scotland.

After two hundred poor wretches had been hanged and burned, there seemed no diminution in the number of criminals to be tried. Many of the latter were asked upon the rack what Satan had said when he found that the commissioners were proceeding with such severity? The general reply was, that he did not seem to care much about it. Some of them asserted that they had boldly reproached him for suffering the execution of their friends, saying, "*Out upon thee, false fiend! thy promise was that they should not die! Look, how thou hast kept thy word! They have been burned, and are a heap of ashes!*" Upon these occasions he was never offended: he would give orders that the sports of the Domdaniel should cease, and producing illusory fires that did not burn, he encouraged them to walk through, assuring them that the fires lighted by the executioner gave no more pain than those. They would then ask him, where their friends were, since they had not suffered; to which the "Father of Lies" invariably replied, that they were happy in a far country, and could see and hear all that was then passing; and that, if they called by name those they wished to converse with, they might hear their voices in reply. Satan then imitated the voices of the defunct witches so successfully that they were all deceived. Having answered all objections, the orgies recommenced and lasted till the cock crew.

De l'Ancre was also very zealous in the trial of unhappy monomaniacs for the crime of lycanthropy. Several who were

arrested confessed, without being tortured, that they were *weir-wolves*, and that at night they rushed out among the flocks and herds killing and devouring. One young man at Besançon, with the full consciousness of the awful fate that awaited him, voluntarily gave himself up to the commissioner Espaignel, and confessed that he was the servant of a strong fiend, who was known by the name of “Lord of the Forests:” by his power he was transformed into the likeness of a wolf. The “Lord of the Forests” assumed the same shape; but was much larger, fiercer, and stronger. They prowled about the pastures together at midnight, strangling the watch-dogs that defended the folds, and killing more sheep than they could devour. He felt, he said, a fierce pleasure in these excursions, and howled in excess of joy as he tore with his fangs the warm flesh of the sheep asunder. This youth was not alone in this horrid confession; many others voluntarily owned that they were *weir-wolves*, and many more were forced by torture to make the same avowal. Such criminals were thought to be too atrocious to be hanged first and then burned: they were generally sentenced to be burned alive, and their ashes to be scattered to the winds. Grave and learned doctors of divinity openly sustained the possibility of these transformations, relying mainly upon the history of Nebuchadnezzar. They could not imagine why, if he had been an ox, modern men could not become wolves by Divine permission and the power of the devil. They also contended that, if men should confess, it was evidence enough, if there had been no other. Delrio mentions that one gentleman accused of lycanthropy was put to the torture no less than twenty times; but still he would not confess. An intoxicating draught was then given him, and under its influence he confessed that he was a *weir-wolf*. Delrio cites this to

shew the extreme equity of the commissioners. They never burned any body till he confessed; and if one course of torture would not suffice, their patience was not exhausted, and they tried him again and again, even to the twentieth time! Well may we exclaim, when such atrocities have been committed in the name of religion,

“Quel lion, quel tigre égale en cruauté,
Une injuste fureur qu’arme la piété?”

The trial of the unhappy Urbain Grandier, the curate of Loudun, for bewitching a number of girls in the convent of the Ursulines in that town, was, like that of the Maréchale d’Ancre, an accusation resorted to by his enemies to ruin one against whom no other charge could be brought so readily. This noted affair, which kept France in commotion for months, and the true character of which was known even at that time, merits no more than a passing notice in this place. It did not spring from the epidemic dread of sorcery then so prevalent, but was carried on by wretched intriguers, who had sworn to have the life of their foe. Such a charge could not be refuted in 1634: the accused could not, as Bodinus expresses it, “make the malice of the prosecutors more clear than the sun;” and his own denial, however intelligible, honest, and straightforward, was held as nothing in refutation of the testimony of the crazy women who imagined themselves bewitched. The more absurd and contradictory their assertions, the stronger the argument employed by his enemies that the devil was in them. He was burned alive, under circumstances of great cruelty. ³⁷

A singular instance of the epidemic fear of witchcraft occurred at Lille, in 1639. A pious but not very sane lady, named Antoinette Bourignon, founded a school, or *hospice*, in that city. One day, on entering the schoolroom, she imagined that she saw a great number of little black angels flying about the heads of the children. In great alarm she told her pupils of what she had seen, warning them to beware of the devil whose imps were hovering about them. The foolish woman continued daily to repeat the same story, and Satan and his power became the only subject of conversation, not only between the girls themselves, but between them and their instructors. One of them at this time ran away from the school. On being brought back and interrogated, she said she had not run away, but had been carried away by the devil; she was a witch, and had been one since the age of seven. Some other little girls in the school went into fits at this announcement, and, on their recovery, confessed that they also were witches. At last the whole of them, to the number of fifty, worked upon each other's imaginations to such a degree that they also confessed that they were witches—that they attended the *Domdaniel*, or meeting of the fiends—that they could ride through the air on broom-sticks, feast on infants' flesh, or creep through a key-hole.

The citizens of Lille were astounded at these disclosures. The clergy hastened to investigate the matter; many of them, to their credit, openly expressed their opinion that the whole affair was an imposture—not so the majority; they strenuously insisted that the confessions of the children were valid, and that it was necessary to make an example by burning them all for witches. The poor parents, alarmed for their offspring, implored the examining Capuchins with

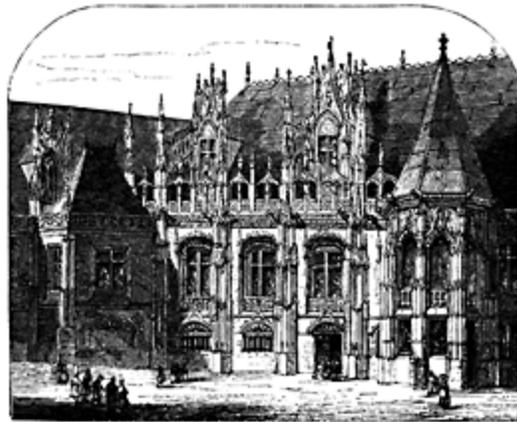
tears in their eyes to save their young lives, insisting that they were bewitched, and not bewitching. This opinion also gained ground in the town. Antoinette Bourignon, who had put these absurd notions into the heads of the children, was accused of witchcraft, and examined before the council. The circumstances of the case seemed so unfavourable towards her that she would not stay for a second examination. Disguising herself as she best could, she hastened out of Lille and escaped pursuit. If she had remained four hours longer, she would have been burned by judicial sentence as a witch and a heretic. It is to be hoped that, wherever she went, she learned the danger of tampering with youthful minds, and was never again entrusted with the management of children.

The Duke of Brunswick and the Elector of Menz were struck with the great cruelty exercised in the torture of suspected persons, and convinced, at the same time, that no righteous judge would consider a confession extorted by pain, and contradictory in itself, as sufficient evidence to justify the execution of any accused person. It is related of the Duke of Brunswick that he invited two learned Jesuits to his house, who were known to entertain strong opinions upon the subject of witchcraft, with a view of shewing them the cruelty and absurdity of such practices. A woman lay in the dungeon of the city accused of witchcraft, and the duke, having given previous instructions to the officiating torturers, went with the two Jesuits to hear her confession. By a series of artful leading questions the poor creature, in the extremity of her anguish, was induced to confess that she had often attended the sabbath of the fiends upon the Brocken; that she had seen two Jesuits there, who had made themselves notorious, even among witches, for their abominations; that she had

seen them assume the form of goats, wolves, and other animals; and that many noted witches had borne them five, six, and seven children at a birth, who had heads like toads, and legs like spiders. Being asked if the Jesuits were far from her, she replied that they were in the room beside her. The Duke of Brunswick led his astounded friends away, and explained the stratagem. This was convincing proof to both of them that thousands of persons had suffered unjustly; they knew their own innocence, and shuddered to think what their fate might have been if an enemy instead of a friend had put such a confession into the mouth of a criminal. One of these Jesuits was Frederick Spee, the author of the *Cautio Criminalis*, published in 1631. This work, exposing the horrors of the witch-trials, had a most salutary effect in Germany: Schonbrunn, Archbishop and Elector of Menz, abolished the torture entirely within his dominions, and his example was imitated by the Duke of Brunswick and other potentates. The number of supposed witches immediately diminished, and the violence of the mania began to subside. The Elector of Brandenburg issued a rescript, in 1654, with respect to the case of Anna of Ellerbrock, a supposed witch, forbidding the use of torture, and stigmatising the swimming of witches as an unjust, cruel, and deceitful test.

This was the beginning of the dawn after the long-protracted darkness. The tribunals no longer condemned witches to execution by hundreds in a year. Würzburg, the grand theatre of the burnings, burned but one where, forty years previously, it had burned three score. From 1660 to 1670 the electoral chambers, in all parts of Germany, constantly commuted the sentence of death passed by the

provincial tribunals into imprisonment for life, or burning on the cheek.



ROUEN.

A truer philosophy had gradually disabused the public mind. Learned men freed themselves from the trammels of a debasing superstition, and governments, both civil and ecclesiastical, repressed the popular delusion they had so long encouraged. The parliament of Normandy condemned a number of women to death, in the year 1670, on the old charge of riding on broomsticks to the Domdaniel; but Louis XIV. commuted the sentence into banishment for life. The parliament remonstrated, and sent the king the following remarkable request. The reader will perhaps be glad to see this document at length. It is of importance, as the last effort of a legislative assembly to uphold this great error; and the arguments they used and the instances they quoted are in the highest degree curious. It reflects honour upon the memory of Louis XIV. that he was not swayed by it.

“REQUEST OF THE PARLIAMENT OF ROUEN TO THE KING, IN 1670.

“SIRE,—Emboldened by the authority which your majesty has committed into our hands in the province of Normandy, to try

and punish offences, and more particularly those offences of the nature of witchcraft, which tend to the destruction of religion and the ruin of nations, we, your parliament, remonstrate humbly with your majesty upon certain cases of this kind which have been lately brought before us. We cannot permit the letter addressed by your majesty's command to the attorney-general of this district, for the reprieve of certain persons condemned to death for witchcraft, and for the staying of proceedings in several other cases, to remain unnoticed, and without remarking upon the consequences which may ensue. There is also a letter from your secretary of state, declaring your majesty's intention to commute the punishment of these criminals into one of perpetual banishment, and to submit to the opinion of the procureur-general, and of the most learned members of the parliament of Paris, whether, in the matter of witchcraft, the jurisprudence of the parliament of Rouen is to be followed in preference to that of the parliament of Paris, and of the other parliaments of the kingdom which judge differently.

“Although by the ordinances of the kings your predecessors, parliaments have been forbidden to pay any attention to *lettres de cachet*; we, nevertheless, from the knowledge which we have, in common with the whole kingdom, of the care bestowed by your majesty for the good of your subjects, and from the submission and obedience to your commandments which we have always manifested, have stayed all proceedings, in conformity to your orders; hoping that your majesty, considering the importance of the crime of witchcraft, and the consequences likely to ensue from its impunity, will be

graciously pleased to grant us once more your permission to continue the trials, and execute judgment upon those found guilty. And as, since we received the letter of your secretary of state, we have also been made acquainted with the determination of your majesty, not only to commute the sentence of death passed upon these witches into one of perpetual banishment from the province, but to re-establish them in the possession of their goods and chattels, and of their good fame and character, your parliament have thought it their duty, on occasion of these crimes, the greatest which men can commit, to make you acquainted with the general and uniform feelings of the people of this province with regard to them; it being, moreover, a question in which are concerned the glory of God and the relief of your suffering subjects, who groan under their fears from the threats and menaces of this sort of persons, and who feel the effects of them every day in the mortal and extraordinary maladies which attack them, and the surprising damage and loss of their possessions.

“Your majesty knows well that there is no crime so opposed to the commands of God as witchcraft, which destroys the very foundation of religion, and draws strange abominations after it. It is for this reason, sire, that the Scriptures pronounce the punishment of death against offenders, and that the Church and the holy fathers have fulminated their anathemas, and that canonical decisions have one and all decreed the most severe punishments, to deter from this crime; and that the Church of France, animated by the piety of the kings your predecessors, has expressed so great a horror at it, that, not judging the

punishment of perpetual imprisonment, the highest it has the power to inflict, sufficiently severe, it has left such criminals to be dealt with by the secular power.

“It has been the general feeling of all nations that such criminals ought to be condemned to death, and all the ancients were of the same opinion. The law of the ‘Twelve Tables,’ which was the principal of the Roman laws, ordains the same punishment. All juris-consults agreed in it, as well as the constitutions of the emperors, and more especially those of Constantine and Theodosius, who, enlightened by the Gospel, not only renewed the same punishment, but also deprived, expressly, all persons found guilty of witchcraft of the right of appeal, and declared them to be unworthy of a prince’s mercy. And Charles VIII., sire, inspired by the same sentiments, passed that beautiful and severe ordinance (*cette belle et sévère ordonnance*), which enjoined the judges to punish witches according to the exigencies of the case, under a penalty of being themselves fined or imprisoned, or dismissed from their office; and decreed, at the same time, that all persons who refused to denounce a witch, should be punished as accomplices; and that all, on the contrary, who gave evidence against one should be rewarded.

“From these considerations, sire, and in the execution of so holy an ordinance, your parliaments, by their decrees, proportion their punishments to the guilt of the offenders; and your parliament of Normandy has never, until the present time, found that its practice was different from that of other courts; for all the books which treat upon this matter cite an infinite

number of decrees condemning witches to be burnt, or broken on the wheel, or to other punishments. The following are examples:—In the time of Chilperic, as may be seen in Gregory of Tours, b. vi. c. 35 of his *History of France*; all the decrees of the parliament of Paris passed according to, and in conformity with, this ancient jurisprudence of the kingdom, cited by Imbert, in his *Judicial Practice*; all those cited by Monstrelet, in 1459, against the witches of Artois; the decrees of the same parliament, of the 13th of October 1573, against Mary Le Fief, native of Saumur; of the 21st of October 1596, against the Sieur de Beaumont, who pleaded, in his defence, that he had only sought the aid of the devil for the purpose of unbewitching the afflicted and of curing diseases; of the 4th of July 1606, against Francis du Bose; of the 20th of July 1582, against Abel de la Rue, native of Coulommiers; of the 2d of October 1593, against Rousseau and his daughter; of 1608, against another Rousseau and one Peley, for witchcraft and adoration of the devil at the Sabbath, under the figure of a he-goat, as confessed by them; the decree of 4th of February 1615, against Leclerc, who appealed from the sentence of the parliament of Orleans, and who was condemned for having attended the Sabbath, and confessed, as well as two of his accomplices, who died in prison, that he had adored the devil, renounced his baptism and his faith in God, danced the witches' dance, and offered up unholy sacrifices; the decrees of the 6th of May 1616, against a man named Leger, on a similar accusation; the pardon granted by Charles IX. to Trois Echelles, upon condition of revealing his accomplices, but afterwards revoked for renewed sorcery on his part; the decree

of the parliament of Paris, cited by Mornac in 1595; the judgments passed in consequence of the commission given by Henry IV. to the Sieur de l'Ancre, councillor of the parliament of Bourdeaux; of the 20th of March 1619, against Etienne Audibert; those passed by the chamber of Nerac, on the 26th of June 1620, against several witches; those passed by the parliament of Toulouse in 1577, as cited by Gregory Tolosanus, against four hundred persons accused of this crime, and who were all marked with the sign of the devil. Besides all these, we might recal to your majesty's recollection the various decrees of the parliament of Provence, especially in the case of Gaufrédy in 1611; the decrees of the parliament of Dijon, and those of the parliament of Rennes, following the example of the condemnation of the Marshal de Rays, who was burned in 1441, for the crime of witchcraft, in presence of the Duke of Brittany;— all these examples, sire, prove that the accusation of witchcraft has always been punished with death by the parliaments of your kingdom, and justify the uniformity of their practice.

“These, sire, are the motives upon which your parliament of Normandy has acted in decreeing the punishment of death against the persons lately brought before it for this crime. If it has happened that, on any occasion, these parliaments, and the parliament of Normandy among the rest, have condemned the guilty to a less punishment than that of death, it was for the reason that their guilt was not of the deepest dye; your majesty, and the kings your predecessors, having left full liberty to the various tribunals to whom they delegated the administration of

justice, to decree such punishment as was warranted by the evidence brought before them.

“After so many authorities, and punishments ordained by human and divine laws, we humbly supplicate your majesty to reflect once more upon the extraordinary results which proceed from the malevolence of this sort of people; on the deaths from unknown diseases, which are often the consequences of their menaces, on the loss of the goods and chattels of your subjects, on the proofs of guilt continually afforded by the insensibility of the marks upon the accused, on the sudden transportation of bodies from one place to another, on the sacrifices and nocturnal assemblies, and other facts, corroborated by the testimony of ancient and modern authors, and verified by so many eye-witnesses, composed partly of accomplices, and partly of people who had no interest in the trials beyond the love of truth, and confirmed, moreover, by the confessions of the accused parties themselves; and that, sire, with so much agreement and conformity between the different cases, that the most ignorant persons convicted of this crime have spoken to the same circumstances, and in nearly the same words, as the most celebrated authors who have written about it, all of which may be easily proved to your majesty’s satisfaction by the records of various trials before your parliaments.

“These, sire, are truths so intimately bound up with the principles of our religion, that, extraordinary although they be, no person has been able to this time to call them in question. If some have cited, in opposition to these truths, the pretended canon of the Council of Ancyre, and a passage from St. Augustin,

in a treatise upon the *Spirit and the Soul*, it has been without foundation; and it would be easy to convince your majesty that neither the one nor the other ought to be accounted of any authority; and, besides that, the canon, in this sense, would be contrary to the opinion of all succeeding councils of the Church, Cardinal Baronius, and all learned commentators agree that it is not to be found in any old edition. In effect, in those editions wherein it is found, it is in another language, and is in direct contradiction to the twenty-third canon of the same council, which condemns sorcery, according to all preceding constitutions. Even supposing that this canon was really promulgated by the Council of Ancyre, we must observe that it was issued in the second century, when the principal attention of the Church was directed to the destruction of paganism. For this reason, it condemns that class of women who said they could pass through the air, and over immense regions, with Diana and Herodias, and enjoins all preachers to teach the falsehood of such an opinion, in order to deter people from the worship of these false divinities; but it does not question the power of the devil over the human body, which is, in fact, proved by the holy Gospel of Jesus Christ himself. And with regard, sire, to the pretended passage of St. Augustin, everybody knows that it was not written by him, because the writer, whoever he was, cites Boetius, who died more than eighty years after the time of St. Augustin. Besides, there is still more convincing proof in the fact, that the same father establishes the truth of witchcraft in all his writings, and more particularly in his *City of God*; and in his first volume, question the 25th, wherein he states that sorcery is

a communion between man and the devil, which all good Christians ought to look upon with horror.

“Taking all these things into consideration, sire, the officers of your parliament hope, from the justice of your majesty, that you will be graciously pleased to receive the humble remonstrances they have taken the liberty to make. They are compelled, for the acquittal of their own consciences and in discharge of their duty, to make known to your majesty, that the decrees they passed against the sorcerers and witches brought before them, were passed after a mature deliberation on the part of all the judges present, and that nothing has been done therein which is not conformable to the universal jurisprudence of the kingdom, and for the general welfare of your majesty’s subjects, of whom there is not one who can say that he is secure from the malevolence of such criminals. We therefore supplicate your majesty to suffer us to carry into effect the sentences we passed, and to proceed with the trial of the other persons accused of the same crime; and that the piety of your majesty will not suffer to be introduced during your reign an opinion contrary to the principles of that holy religion for which you have always employed so gloriously both your cares and your arms.”

Louis, as we have already mentioned, paid no attention to this appeal. The lives of the old women were spared, and prosecutions for mere witchcraft, unconnected with other offences, were discontinued throughout France. In 1680 an act was passed for the punishment, not of witches, but of pretenders to witchcraft, fortune-tellers, divineresses, and poisoners.

Thus the light broke in upon Germany, France, England, and Scotland about the same time, gradually growing clearer and clearer till the middle of the eighteenth century, when witchcraft was finally reckoned amongst exploded doctrines, and the belief in it confined to the uttermost vulgar. Twice, however, did the madness burst forth again as furious, while it lasted, as ever it had been. The first time in Sweden, in 1669, and the second in Germany so late as 1749. Both these instances merit particular mention. The first is one of the most extraordinary upon record, and for atrocity and absurdity is unsurpassed in the annals of any nation.



LOUIS XIV.

It having been reported to the king of Sweden that the little village of Mohra, in the province of Dalecarlia, was troubled exceedingly with witches, he appointed a commission of clergy and laymen to trace the rumour to its source, with full powers to punish the guilty. On the 12th of August 1669, the commissioners arrived in the bewitched village, to the great joy of the credulous inhabitants. On the following day the whole population, amounting to three thousand persons, assembled in the church. A sermon was preached, “declaring the miserable case of those people that suffered

themselves to be deluded by the devil,” and fervent prayer was offered up that God would remove the scourge from among them.

The whole assembly then adjourned to the rector’s house, filling all the street before it, when the king’s commission was read, charging every person who knew any thing of the witchery, to come forward and declare the truth. A passion of tears seized upon the multitude; men, women, and children began to weep and sob, and all promised to divulge what they had heard or knew. In this frame of mind they were dismissed to their homes. On the following day they were again called together, when the depositions of several persons were taken publicly before them all. The result was that seventy persons, including fifteen children, were taken into custody. Numbers also were arrested in the neighbouring district of Elfdale. Being put to the torture, they all confessed their guilt. They said they used to go to a gravel-pit, that lay hard by the cross-way, where they put a vest upon their heads, and danced “round and round and round about.” They then went to the cross-way, and called three times upon the devil; the first time in a low still voice; the second, somewhat louder; and the third, very loudly, with these words, “Antecessor, come, and carry us to Blockula!” This invocation never failed to bring him to their view. He generally appeared as a little old man, in a grey coat, with red and blue stockings, with exceedingly long garters. He had besides a very high-crowned hat, with bands of many-coloured linen enfolded about it, and a long red beard that hung down to his middle.

The first question he put to them was, whether they would serve him soul and body? On their answering in the affirmative, he told them to make ready for the journey to Blockula. It was necessary to procure, in the first place, “some scrapings of altars and filings of

church clocks.” Antecessor then gave them a horn with some salve in it, wherewith they anointed themselves. These preparations ended, he brought beasts for them to ride upon,—horses, asses, goats, and monkeys; and giving them a saddle, a hammer, and a nail, uttered the word of command, and away they went. Nothing stopped them. They flew over churches, high walls, rocks, and mountains, until they came to the green meadow where Blockula was situated. Upon these occasions they carried as many children with them as they could; for the devil, they said, “did plague and whip them if they did not procure him children, insomuch that they had no peace or quiet for him.”

Many parents corroborated a part of this evidence, stating that their children had repeatedly told them that they had been carried away in the night to Blockula, where the devil had beaten them black and blue. They had seen the marks in the morning, but they soon disappeared. One little girl was examined, who swore positively that she was carried through the air by the witches, and when at a great height she uttered the holy name of Jesus. She immediately fell to the ground, and made a great hole in her side. “The devil, however, picked her up, healed her side, and carried her away to Blockula.” She added (and her mother confirmed her statement), that she had till that day “an exceeding great pain in her side.” This was a clencher, and the nail of conviction was driven home to the hearts of the judges.

The place called Blockula, whither they were carried, was a large house, with a gate to it, “in a delicate meadow, whereof they could see no end.” There was a very long table in it, at which the witches sat

down; and in other rooms “there were very lovely and delicate beds for them to sleep upon.”

After a number of ceremonies had been performed, by which they bound themselves body and soul to the service of Antecessor, they sat down to a feast composed of broth, made of colworts and bacon, oatmeal, bread and butter, milk and cheese. The devil always took the chair, and sometimes played to them on the harp or the fiddle while they were eating. After dinner they danced in a ring, sometimes naked, and sometimes in their clothes, cursing and swearing all the time. Some of the women added particulars too horrible and too obscene for repetition.

Once the devil pretended to be dead, that he might see whether his people regretted him. They instantly set up a loud wail, and wept three tears each for him; at which he was so pleased, that he jumped up among them, and hugged in his arms those who had been most obstreperous in their sorrow.

Such were the principal details given by the children, and corroborated by the confessions of the full-grown witches. Any thing more absurd was never before stated in a court of justice. Many of the accused contradicted themselves most palpably; but the commissioners gave no heed to discrepancies. One of them, the parson of the district, stated in the course of the inquiry, that on a particular night, which he mentioned, he had been afflicted with a headache so agonising, that he could not account for it otherwise than by supposing he was bewitched. In fact, he thought a score of witches must have been dancing on the crown of his head. This announcement excited great horror among the pious dames of the auditory, who loudly expressed their wonder that the devil should

have power to hurt so good a man. One poor witch, who lay in the very jaws of death, confessed that she knew too well the cause of the minister's headache. The devil had sent her with a sledge hammer and a large nail to drive into the good man's skull. She had hammered at it for some time, but the skull was so enormously *thick*, that she made no impression upon it. Every hand was held up in astonishment. The pious minister blessed God that his skull was so solid, and he became renowned for his thick head all the days of his life. Whether the witch intended a joke does not appear, but she was looked upon as a criminal more than usually atrocious. Seventy persons were condemned to death on these so awful, yet so ridiculous confessions. Twenty-three of them were burned together in one fire in the village of Mohra, in the presence of thousands of delighted spectators. On the following day fifteen children were murdered in the same manner, offered up in sacrifice to the bloody Moloch of superstition. The remaining thirty-two were executed at the neighbouring town of Fahluna. Besides these, fifty-six children were found guilty of witchcraft in a minor degree, and sentenced to various punishments, such as running the gauntlet, imprisonment, and public whipping once a week for a twelvemonth.

Long after the occurrence of this case, it was cited as one of the most convincing proofs upon record of the prevalence of witchcraft. When men wish to construct or support a theory, how they torture facts into their service! The lying whimsies of a few sick children, encouraged by foolish parents, and drawn out by superstitious neighbours, were sufficient to set a country in a flame. If, instead of commissioners as deeply sunk in the slough of ignorance as the people they were sent amongst, there had been deputed a few men

firm in courage and clear in understanding, how different would have been the result! Some of the poor children who were burned would have been sent to an infirmary; others would have been well flogged; the credulity of the parents would have been laughed at; and the lives of seventy persons spared. The belief in witchcraft remains in Sweden to this day; but happily the annals of that country present no more such instances of lamentable aberration of intellect as the one just cited.

In New England, about the same time, the colonists were scared by similar stories of the antics of the devil. All at once a fear seized upon the multitude, and supposed criminals were arrested day after day in such numbers, that the prisons were found too small to contain them. A girl named Goodwin, the daughter of a mason, who was hypochondriac and subject to fits, imagined that an old Irish woman, named Glover, had bewitched her. Her two brothers, in whose constitutions there was apparently a predisposition to similar fits, went off in the same way, crying out that the devil and Dame Glover were tormenting them. At times their joints were so stiff that they could not be moved; while at others, said the neighbours, they were so flexible, that the bones appeared softened into sinews. The supposed witch was seized, and as she could not repeat the Lord's Prayer without making a mistake in it, she was condemned and executed.

But the popular excitement was not allayed. One victim was not enough; the people waited agape for new disclosures. Suddenly two hysteric girls in another family fell into fits daily, and the cry of witchcraft resounded from one end of the colony to the other. The feeling of suffocation in the throat, so common in cases of hysteria,

was said by the patients to be caused by the devil himself, who had stuck balls in the windpipe to choke them. They felt the pricking of thorns in every part of the body, and one of them vomited needles. The case of these girls, who were the daughter and niece of a Mr. Parvis, the minister of a Calvinist chapel, excited so much attention, that all the weak women in the colony began to fancy themselves similarly afflicted. The more they brooded on it, the more convinced they became. The contagion of this mental disease was as great as if it had been a pestilence. One after the other the women fainted away, asserting on their recovery that they had seen the spectres of witches. Where there were three or four girls in a family, they so worked each upon the diseased imagination of the other, that they fell into fits five or six times in a day. Some related that the devil himself appeared to them, bearing in his hand a parchment-roll, and promising that if they would sign an agreement, transferring to him their immortal souls, they should be immediately relieved from fits and all the ills of the flesh. Others asserted that they saw witches only, who made them similar promises, threatening that they should never be free from aches and pains till they had agreed to become the devil's. When they refused, the witches pinched, or bit, or pricked them with long pins and needles. More than two hundred persons named by these mischievous visionaries were thrown into prison. They were of all ages and conditions of life, and many of them of exemplary character. No less than nineteen were condemned and executed before reason returned to the minds of the colonists. The most horrible part of this lamentable history is, that among the victims there was a little child only five years old. Some women swore that they had seen it repeatedly in company with the devil, and that it had

bitten them often with its little teeth for refusing to sign a compact with the evil one. It can hardly increase our feelings of disgust and abhorrence when we learn that this insane community actually tried and executed a dog for the same offence!

One man, named Cory, stoutly refused to plead to the preposterous indictment against him. As was the practice in such cases, he was pressed to death. It is told of the Sheriff of New England, who superintended the execution, that when this unhappy man thrust out his tongue in his mortal agony, he seized hold of a cane, and crammed it back again into the mouth. If ever there were a fiend in human form, it was this sheriff: a man who, if the truth were known, perhaps plumed himself upon his piety—thought he was doing God good service, and

“Hoped to merit heaven by making earth a hell!”

Arguing still in the firm belief of witchcraft, the bereaved people began to inquire, when they saw their dearest friends snatched away from them by these wide-spreading accusations, whether the whole proceedings were not carried on by the agency of the devil. Might not the great enemy have put false testimony into the mouths of the witnesses, or might not the witnesses be witches themselves? Every man who was in danger of losing his wife, his child, or his sister, embraced this doctrine with avidity. The revulsion was as sudden as the first frenzy. All at once, the colonists were convinced of their error. The judges put a stop to the prosecutions, even of those who had confessed their guilt. The latter were no sooner at liberty than they retracted all they had said, and the greater number hardly remembered the avowals which agony had extorted from them. Eight

persons, who had been tried and condemned, were set free; and gradually girls ceased to have fits and to talk of the persecutions of the devil. The judge who had condemned the first criminal executed on this charge, was so smitten with sorrow and humiliation at his folly, that he set apart the anniversary of that day as one of solemn penitence and fasting. He still clung to the belief in witchcraft; no new light had broken in upon him on that subject, but, happily for the community, the delusion had taken a merciful turn. The whole colony shared the feeling; the jurors on the different trials openly expressed their penitence in the churches; and those who had suffered were regarded as the victims, and not as the accomplices of Satan.

It is related that the Indian tribes in New England were sorely puzzled at the infatuation of the settlers, and thought them either a race inferior to, or more sinful than the French colonists in the vicinity, amongst whom, as they remarked, “the Great Spirit sent no witches.”

Returning again to the continent of Europe, we find that, after the year 1680, men became still wiser upon this subject. For twenty years the populace were left to their belief, but governments in general gave it no aliment in the shape of executions. The edict of Louis XIV. gave a blow to the superstition, from which it never recovered. The last execution in the Protestant cantons of Switzerland was at Geneva, in 1652. The various potentates of Germany, although they could not stay the trials, invariably commuted the sentence into imprisonment, in all cases where the pretended witch was accused of pure witchcraft, unconnected with any other crime. In the year 1701, Thomasius, the learned professor

at the University of Halle, delivered his inaugural thesis, *De Crimine Magiæ* which struck another blow at the falling monster of popular error. But a faith so strong as that in witchcraft was not to be eradicated at once: the arguments of learned men did not penetrate to the villages and hamlets; but still they achieved great things; they rendered the belief an unworking faith, and prevented the supply of victims, on which for so many ages it had battered and grown strong.

Once more the delusion broke out; like a wild beast wounded to the death, it collected all its remaining energies for the final convulsion, which was to shew how mighty it had once been. Germany, which had nursed the frightful error in its cradle, tended it on its death-bed, and Würzburg, the scene of so many murders on the same pretext, was destined to be the scene of the last. That it might lose no portion of its bad renown, the last murder was as atrocious as the first. This case offers a great resemblance to that of the witches of Mohra and New England, except in the number of its victims. It happened so late as the year 1749, to the astonishment and disgust of the rest of Europe.



VIEW IN WÜRZBURG.

A number of young women in a convent at Würzburg fancied themselves bewitched; they felt, like all hysteric subjects, a sense of suffocation in the throat. They went into fits repeatedly; and one of them, who had swallowed needles, evacuated them at abscesses, which formed in different parts of the body. The cry of sorcery was raised, and a young woman, named Maria Renata Sängler, was arrested on the charge of having leagued with the devil, to bewitch five of the young ladies. It was sworn on the trial that Maria had been frequently seen to clamber over the convent walls in the shape of a

pig—that, proceeding to the cellar, she used to drink the best wine till she was intoxicated; and then start suddenly up in her own form. Other girls asserted that she used to prowl about the roof like a cat, and often penetrate into their chamber, and frighten them by her dreadful howlings. It was also said that she had been seen in the shape of a hare, milking the cows dry in the meadows belonging to the convent; that she used to perform as an actress on the boards of Drury Lane theatre in London, and, on the very same night, return upon a broomstick to Würzburg, and afflict the young ladies with pains in all their limbs. Upon this evidence she was condemned, and burned alive in the market-place of Würzburg.

Here ends this frightful catalogue of murder and superstition. Since that day, the belief in witchcraft has fled from the populous abodes of men, and taken refuge in remote villages and districts too wild, rugged, and inhospitable to afford a resting-place for the foot of civilisation. Rude fishers and uneducated labourers still attribute every phenomenon of nature which they cannot account for, to the devil and witches. Catalepsy, that wondrous disease, is still thought by ignorant gossips to be the work of Satan; and hypochondriacs, uninformed by science of the nature of their malady, devoutly believe in the reality of their visions. The reader would hardly credit the extent of the delusion upon this subject in the very heart of England at this day. Many an old woman leads a life of misery from the unfeeling insults of her neighbours, who raise the scornful finger and hooting voice at her, because in her decrepitude she is ugly, spiteful, perhaps insane, and realises in her personal appearance the description preserved by tradition of the witches of yore. Even in the neighbourhood of great towns the taint remains of this once widely-

spread contagion. If no victims fall beneath it, the enlightenment of the law is all that prevents a recurrence of scenes as horrid as those of the seventeenth century. Hundreds upon hundreds of witnesses could be found to swear to absurdities as great as those asserted by the infamous Matthew Hopkins.

In the *Annual Register* for 1760, an instance of the belief in witchcraft is related, which shews how superstition lingers. A dispute arose in the little village of Glen, in Leicestershire, between two old women, each of whom vehemently accused the other of witchcraft. The quarrel at last ran so high that a challenge ensued, and they both agreed to be tried by the ordeal of swimming. They accordingly stripped to their shifts—procured some men, who tied their thumbs and great toes together, cross-wise, and then, with a cart-rope about their middle, suffered themselves to be thrown into a pool of water. One of them sank immediately, but the other continued struggling a short time upon the surface of the water, which the mob deeming an infallible sign of her guilt, pulled her out, and insisted that she should immediately impeach all her accomplices in the craft. She accordingly told them that, in the neighbouring village of Burton, there were several old women as “much witches as she was.” Happily for her, this negative information was deemed sufficient, and a student in astrology, or “white-witch,” coming up at the time, the mob, by his direction, proceeded forthwith to Burton in search of all the delinquents. After a little consultation on their arrival, they went to the old woman’s house on whom they had fixed the strongest suspicion. The poor old creature on their approach locked the outer door, and from the window of an upstairs room asked what they wanted. They informed her that she was charged with being guilty of

witchcraft, and that they were come to duck her; remonstrating with her at the same time upon the necessity of submission to the ordeal, that, if she were innocent, all the world might know it. Upon her persisting in a positive refusal to come down, they broke open the door and carried her out by force, to a deep gravel-pit full of water. They tied her thumbs and toes together and threw her into the water, where they kept her for several minutes, drawing her out and in two or three times by the rope round her middle. Not being able to satisfy themselves whether she were a witch or no, they at last let her go, or, more properly speaking, they left her on the bank to walk home by herself, if she ever recovered. Next day, they tried the same experiment upon another woman, and afterwards upon a third; but, fortunately, neither of the victims lost her life from this brutality. Many of the ringleaders in the outrage were apprehended during the week, and tried before the justices at quarter-sessions. Two of them were sentenced to stand in the pillory and to be imprisoned for a month; and as many as twenty more were fined in small sums for the assault, and bound over to keep the peace for a twelvemonth.

“So late as the year 1785,” says Arnot, in his collection and abridgment of *Criminal Trials in Scotland*, “it was the custom among the sect of Seceders to read from the pulpit an annual confession of sins, national and personal; amongst the former of which was particularly mentioned the ‘Repeal by parliament of the penal statute against witches, contrary to the express laws of God.’”



LADY HATTON'S HOUSE, CROSS STREET, HATTON GARDEN.

Many houses are still to be found in England with the horse-shoe (the grand preservative against witchcraft) nailed against the threshold. If any over-wise philosopher should attempt to remove them, the chances are that he would have more broken bones than thanks for his interference. Let any man walk into Cross Street, Hatton Garden, and from thence into Bleeding-heart Yard, and learn the tales still told and believed of one house in that neighbourhood, and he will ask himself in astonishment if such things can be in the nineteenth century. The witchcraft of Lady Hatton, the wife of the famous Sir Christopher, so renowned for his elegant dancing in the days of Elizabeth, is as devoutly believed as the Gospels. The room is to be seen where the devil seized her after the expiration of the contract he had made with her, and bore her away bodily to the pit of Tophet: the pump against which he dashed her is still pointed out, and the spot where her heart was found, after he had torn it out of her bosom with his iron claws, has received the name of Bleeding-heart Yard, in confirmation of the story. Whether the horse-shoe still remains upon the door of the haunted house, to keep away other witches, is uncertain. A former inmate relates that, "about twenty years ago, more than one old woman begged for admittance

repeatedly, to satisfy themselves that it was in its proper place. One poor creature, apparently insane, and clothed in rags, came to the door with a tremendous double-knock, as loud as that of a fashionable footman, and walked straight along the passage to the horse-shoe. Great was the wonderment of the inmates, especially when the woman spat upon the horse-shoe, and expressed her sorrow that she could do no harm while it remained there. After spitting upon, and kicking it again and again, she coolly turned round and left the house, without saying a word to any body. This poor creature perhaps intended a joke, but the probability is that she imagined herself a witch. In Saffron Hill, where she resided, her ignorant neighbours gave her that character, and looked upon her with no little fear and aversion.”

More than one example of the popular belief in witchcraft occurred in the neighbourhood of Hastings so lately as the year 1830. An aged woman, who resided in the Rope-walk of that town, was so repulsive in her appearance, that she was invariably accused of being a witch by all the ignorant people who knew her. She was bent completely double; and though very old, her eye was unusually bright and malignant. She wore a red cloak, and supported herself on a crutch: she was, to all outward appearance, the very *beau ideal* of a witch. So dear is power to the human heart, that this old woman actually encouraged the popular superstition; she took no pains to remove the ill impression, but seemed to delight that she, old and miserable as she was, could keep in awe so many happier and stronger fellow-creatures. Timid girls crouched with fear when they met her, and many would go a mile out of their way to avoid her. Like the witches of the olden time, she was not sparing of her curses against those

who offended her. The child of a woman who resided within two doors of her was afflicted with lameness, and the mother constantly asserted that the old woman had bewitched her. All the neighbours credited the tale. It was believed, too, that she could assume the form of a cat. Many a harmless puss has been hunted almost to the death by mobs of men and boys, upon the supposition that the animal would start up before them in the true shape of Mother —.

In the same town there resided a fisherman, who was the object of unceasing persecution, because it was said that he had sold himself to the devil. It was currently reported that he could creep through a keyhole, and that he had made a witch of his daughter, in order that he might have the more power over his fellows. It was also believed that he could sit on the points of pins and needles and feel no pain. His brother fishermen put him to this test whenever they had an opportunity. In the alehouses which he frequented, they often placed long needles in the cushions of the chairs in such a manner that he could not fail to pierce himself when he sat down. The result of these experiments tended to confirm their faith in his supernatural powers. It was asserted that he never flinched. Such was the popular feeling in the fashionable town of Hastings a few years ago; very probably it is the same now.

In the north of England, the superstition lingers to an almost inconceivable extent. Lancashire abounds with witch-doctors, a set of quacks who pretend to cure diseases inflicted by the devil. The practices of these worthies may be judged of by the following case, reported in the *Hertford Reformer* of the 23d of June 1838. The witch-doctor alluded to is better known by the name of the *cunning man*, and has a large practice in the counties of Lincoln and

Nottingham. According to the writer in the *Reformer*, the dupe, whose name is not mentioned, had been for about two years afflicted with a painful abscess, and had been prescribed for without relief by more than one medical gentleman. He was urged by some of his friends, not only in his own village but in neighbouring ones, to consult the witch-doctor, as they were convinced he was under some evil influence. He agreed, and sent his wife to the *cunning man*, who lived in New St. Swithin's, in Lincoln. She was informed by this ignorant impostor that her husband's disorder was an infliction of the devil, occasioned by his next-door neighbours, who had made use of certain charms for that purpose. From the description he gave of the process, it appears to be the same as that employed by Dr. Fian and Gellie Duncan to work woe upon King James. He stated that the neighbours, instigated by a witch, whom he pointed out, took some wax and moulded it before the fire into the form of her husband, as near as they could represent him; they then pierced the image with pins on all sides, repeated the Lord's Prayer backwards, and offered prayers to the devil that he would fix his stings into the person whom that figure represented, in like manner as they pierced *it* with pins. To counteract the effects of this diabolical process, the witch-doctor prescribed a certain medicine, and a charm to be worn next the body, on that part where the disease principally lay. The patient was to repeat the 109th and 119th Psalms every day, or the cure would not be effectual. The fee which he claimed for this advice was a guinea.

So efficacious is faith in the cure of any malady, that the patient actually felt much better after a three weeks' course of this prescription. The notable charm which the quack had given was

afterwards opened, and found to be a piece of parchment covered with some cabalistic characters and signs of the planets.

The next-door neighbours were in great alarm that the witch-doctor would, on the solicitation of the recovering patient, employ some means to punish them for their pretended witchcraft. To escape the infliction, they feed another cunning man, in Nottinghamshire, who told them of a similar charm, which would preserve them from all the malice of their enemies. The writer concludes by saying, that “the doctor, not long after he had been thus consulted, wrote to say, that he had discovered that his patient was not afflicted by Satan, as he had imagined, but by God, and would continue more or less in the same state till his life’s end.”

An impostor carried on a similar trade in the neighbourhood of Tunbridge Wells about the year 1830. He had been in practice for several years, and charged enormous fees for his advice. This fellow pretended to be the seventh son of a seventh son, and to be endowed in consequence with miraculous powers for the cure of all diseases, but especially of those resulting from witchcraft. It was not only the poor who employed him, but ladies who rode in their carriages. He was often sent for from a distance of sixty or seventy miles by these people, who paid all his expenses to and fro, besides rewarding him handsomely. He was about eighty years of age, and his extremely venerable appearance aided his imposition in no slight degree. His name was Okey or Oakley.

In France, the superstition at this day is even more prevalent than it is in England. Garinet, in his history of Magic and Sorcery in that country, cites upwards of twenty instances which occurred between the years 1805 and 1818. In the latter year no less than three

tribunals were occupied with trials originating in this humiliating belief: we shall cite only one of them. Julian Desbourdes, aged fifty-three, a mason, and inhabitant of the village of Thilouze, near Bourdeaux, was taken suddenly ill, in the month of January 1818. As he did not know how to account for his malady, he suspected at last that he was bewitched. He communicated this suspicion to his son-in-law Bridier, and they both went to consult a sort of idiot, named Baudouin, who passed for a conjuror or *white-witch*. This man told them that Desbourdes was certainly bewitched, and offered to accompany them to the house of an old man named Renard, who, he said, was undoubtedly the criminal. On the night of the 23d of January all three proceeded stealthily to the dwelling of Renard, and accused him of afflicting persons with diseases by the aid of the devil. Desbourdes fell on his knees and earnestly entreated to be restored to his former health, promising that he would take no measures against him for the evil he had done. The old man denied in the strongest terms that he was a wizard; and when Desbourdes still pressed him to remove the spell from him, he said he knew nothing about the spell, and refused to remove it. The idiot Baudouin, the *white-witch*, now interfered, and told his companions that no relief for the malady could ever be procured until the old man confessed his guilt. To force him to confession they lighted some sticks of sulphur which they had brought with them for the purpose, and placed them under the old man's nose. In a few moments he fell down suffocated and apparently lifeless. They were all greatly alarmed; and thinking that they had killed the man, they carried him out and threw him into a neighbouring pond, hoping to make it appear that he had fallen in accidentally. The pond, however, was not

very deep, and the coolness of the water reviving the old man, he opened his eyes and sat up. Desbourdes and Bridier, who were still waiting on the bank, were now more alarmed than before, lest he should recover and inform against them. They therefore waded into the pond, seized their victim by the hair of the head, beat him severely, and then held him under water till he was drowned.

They were all three apprehended on the charge of murder a few days afterwards. Desbourdes and Bridier were found guilty of aggravated manslaughter only, and sentenced to be burnt on the back, and to work in the galleys for life. The *white-witch* Baudouin was acquitted on the ground of insanity.

M. Garinet further informs us that France, at the time he wrote (1818), was overrun by a race of fellows who made a trade of casting out devils and finding out witches. He adds also, that many of the priests in the rural districts encouraged the superstition of their parishioners by resorting frequently to exorcisms whenever any foolish persons took it into their heads that a spell had been thrown over them. He recommended, as a remedy for the evil, that all these exorcists, whether lay or clerical, should be sent to the galleys, and felt assured that the number of witches would then very sensibly diminish.

Many other instances of this lingering belief might be cited both in France and Great Britain, and indeed in every other country in Europe. So deeply rooted are some errors, that ages cannot remove them. The poisonous tree that once overshadowed the land may be cut down by the sturdy efforts of sages and philosophers; the sun may shine clearly upon spots where venomous things once nestled in security and shade; but still the entangled roots are stretched

beneath the surface, and may be found by those who dig. Another king like James I. might make them vegetate again; and, more mischievous still, another pope like Innocent VIII. might raise the decaying roots to strength and verdure. Still it is consoling to think that the delirium has passed away; that the raging madness has given place to a milder folly; and that we may now count by units the votaries of a superstition which in former ages numbered its victims by tens of thousands, and its votaries by millions.



FLOATING A WITCH.



PLACE DE GREVE.

THE SLOW POISONERS.

Pescara. The like was never read of.

Stephano. In my judgment,
To all that shall but hear it, 'twill appear
A most impossible fable.

Pescara. Troth, I'll tell you,
And briefly as I can, by what degrees
They fell into this madness.—*Duke of Milan.*

THE atrocious system of poisoning by poisons so slow in their operation as to make the victim appear, to ordinary observers, as if dying from a gradual decay of nature, has been practised in all ages. Those who are curious in the matter may refer to Beckmann on secret poisons, in his *History of Inventions*, in which he has collected several instances of it from the Greek and Roman writers. Early in the sixteenth century the crime seems to have gradually increased, till in the seventeenth it spread over Europe like a pestilence. It was often exercised by pretended witches and sorcerers, and finally became a branch of education amongst all who laid any claim to magical and supernatural arts. In the twenty-first year of Henry VIII. an act was passed rendering it high treason. Those found guilty of it were to be boiled to death.

One of the first in point of date, and hardly second to any in point of atrocity, is the murder by this means of Sir Thomas Overbury; which disgraced the court of James I. in the year 1613. A slight sketch of it will be a fitting introduction to the history of the poisoning mania, which was so prevalent in France and Italy fifty years later.

Robert Kerr, a Scottish youth, was early taken notice of by James I., and loaded with honours, for no other reason that the world could ever discover than the beauty of his person. James, even in his own day, was suspected of being addicted to the most abominable of all offences; and the more we examine his history now, the stronger the suspicion becomes. However that may be, the handsome Kerr, lending his smooth cheek even in public to the disgusting kisses of his royal master, rose rapidly in favour. In the year 1613, he was made Lord High Treasurer of Scotland, and created an English peer by the style and title of Viscount Rochester. Still further honours were in store for him.

In this rapid promotion he had not been without a friend. Sir Thomas Overbury, the king's secretary—who appears, from some threats in his own letters, to have been no better than a pander to the vices of the king, and privy to his dangerous secrets—exerted all his backstair influence to forward the promotion of Kerr, by whom he was doubtless repaid in some way or other. Overbury did not confine his friendship to this—if friendship ever could exist between two such men—but acted the part of an *entremetteur*, and assisted Rochester to carry on an adulterous intrigue with the Lady Frances Howard, the wife of the Earl of Essex. This woman was a person of violent passions, and lost to all sense of shame. Her husband was in her way, and to be freed from him she instituted proceedings for a divorce, on grounds which a woman of any modesty or delicacy of feeling would die rather than avow. Her scandalous suit was successful, and was no sooner decided than preparations on a scale of the greatest magnificence were made for her marriage with Lord Rochester.

Sir Thomas Overbury, who had willingly assisted his patron to intrigue with the Countess of Essex, seems to have imagined that his marriage with so vile a woman might retard his advancement. He accordingly employed all his influence to dissuade him from it; but Rochester was bent on the match, and his passions were as violent as those of the countess. On one occasion, when Overbury and the viscount were walking in the gallery of

Whitehall, Overbury was overheard to say, "Well, my lord, if you do marry that base woman, you will utterly ruin your honour and yourself. You shall never do it with my advice or consent; and if you do, you had best look to stand fast." Rochester flung from him in a rage, exclaiming with an oath, "I will be even with you for this." These words were the death-warrant of the unfortunate Overbury. He had mortally wounded the pride of Rochester in insinuating that by his (Overbury's) means he might be lowered in the king's favour; and he had endeavoured to curb the burning passions of a heartless, dissolute, and reckless man.

Overbury's imprudent remonstrances were reported to the countess; and from that moment she also vowed the most deadly vengeance against him. With a fiendish hypocrisy, however, they both concealed their intentions; and Overbury, at the solicitation of Rochester, was appointed ambassador to the court of Russia. This apparent favour was but the first step in a deep and deadly plot. Rochester, pretending to be warmly attached to the interests of Overbury, advised him to refuse the embassy, which he said was but a trick to get him out of the way. He promised, at the same time, to stand between him and any evil consequences which might result from his refusal. Overbury fell into the snare, and declined the embassy. James, offended, immediately ordered his committal to the Tower.

He was now in safe custody, and his enemies had opportunity to commence the work of vengeance. The first thing Rochester did was to procure, by his influence at court, the dismissal of the Lieutenant of the Tower, and the appointment of Sir Jervis Elwes, one of his creatures, to the vacant post. This man was but one instrument; and another being necessary, was found in Richard Weston, a fellow who had formerly been shopman to a druggist. He was installed in the office of under-keeper, and as such had the direct custody of Overbury. So far all was favourable to the designs of the conspirators.

In the mean time the insidious Rochester wrote the most friendly letters to Overbury, requesting him to bear his ill-fortune patiently, and promising

that his imprisonment should not be of long duration; for that his friends were exerting themselves to soften the king's displeasure. Still pretending the extreme of sympathy for him, he followed up the letters by presents of pastry and other delicacies, which could not be procured in the Tower. These articles were all poisoned. Occasionally, presents of a similar description were sent to Sir Jervis Elwes, with the understanding that these articles were not poisoned, when they were unaccompanied by letters: of these the unfortunate prisoner never tasted. A woman named Turner, who had formerly kept a house of ill-fame, and who had more than once lent it to further the guilty intercourse of Rochester and Lady Essex, was the agent employed to procure the poisons. They were prepared by Dr. Forman, a pretended fortune-teller of Lambeth, assisted by an apothecary named Franklin. Both these persons knew for what purposes the poisons were needed, and employed their skill in mixing them in the pastry and other edibles, in such small quantities as gradually to wear out the constitution of their victim. Mrs. Turner regularly furnished the poisoned articles to the under-keeper, who placed them before Overbury. Not only his food but his drink was poisoned. Arsenic was mixed with the salt he ate, and cantharides with the pepper. All this time his health declined sensibly. Daily he grew weaker and weaker; and with a sickly appetite craved for sweets and jellies. Rochester continued to condole with him, and anticipated all his wants in this respect, sending him abundance of pastry, and occasionally partridges and other game, and young pigs. With the sauce for the game, Mrs. Turner mixed a quantity of cantharides, and poisoned the pork with lunar-caustic. As stated on the trial, Overbury took in this manner poison enough to have poisoned twenty men; but his constitution was strong, and he still lingered. Franklin, the apothecary, confessed that he prepared with Dr. Forman seven different sorts of poisons, viz. aquafortis, arsenic, mercury, powder of diamonds, lunar caustic, great spiders, and cantharides. Overbury held out so long that Rochester became impatient, and in a letter to Lady Essex, expressed his

wonder that things were not sooner despatched. Orders were immediately sent by Lady Essex to the keeper to finish with the victim at once. Overbury had not been all this time without suspicion of treachery, although he appears to have had no idea of poison. He merely suspected that it was intended to confine him for life, and to set the king still more bitterly against him. In one of his letters he threatened Rochester that unless he were speedily liberated, he would expose his villany to the world. He says, "You and I, ere it be long, will come to a public trial of another nature." * * * "Drive me not to extremities, lest I should say something that both you and I should repent." * * * "Whether I live or die, your shame shall never die, but ever remain to the world, to make you the most odious man living." * * * "I wonder much you should neglect him to whom such secrets of all kinds have passed." * * * "Be these the fruits of common secrets, common dangers?"



SIR THOMAS OVERBURY.

All these remonstrances, and hints as to the dangerous secrets in his keeping, were ill calculated to serve him with a man so reckless as Lord Rochester: they were more likely to cause him to be sacrificed than to be saved. Rochester appears to have acted as if he thought so. He doubtless employed the murderer's reasoning, that "dead men tell no tales," when, after receiving letters of this description, he complained to his paramour of

the delay. Weston was spurred on to consummate the atrocity; and the patience of all parties being exhausted, a dose of corrosive sublimate was administered to him in October 1613, which put an end to his sufferings, after he had been for six months in their hands. On the very day of his death, and before his body was cold, he was wrapped up carelessly in a sheet, and buried without any funeral ceremony in a pit within the precincts of the Tower.

Sir Anthony Weldon, in his *Court and Character of James I.*, gives a somewhat different account of the closing scene of this tragedy. He says, "Franklin and Weston came into Overbury's chamber, and found him in infinite torment, with contention between the strength of nature and the working of the poison; and it being very like that nature had gotten the better in this contention, by the thrusting out of boils, blotches, and blains, they, fearing it might come to light by the judgment of physicians, the foul play that had been offered him, consented to stifle him with the bedclothes, which accordingly was performed; and so ended his miserable life, with the assurance of the conspirators that he died by the poison; none thinking otherwise than these two murderers."

The sudden death, the indecent haste of the funeral, and the non-holding of an inquest upon the body, strengthened the suspicions that were afloat. Rumour, instead of whispering, began to speak out; and the relatives of the deceased openly expressed their belief that their kinsman had been murdered. But Rochester was still all powerful at court, and no one dared to utter a word to his discredit. Shortly afterwards, his marriage with the Countess of Essex was celebrated with the utmost splendour, the king himself being present at the ceremony.

It would seem that Overbury's knowledge of James's character was deeper than Rochester had given him credit for, and that he had been a true prophet when he predicted that his marriage would eventually estrange James from his minion. At this time, however, Rochester stood higher than ever in the royal favour; but it did not last long—conscience,

that busy monitor, was at work. The tongue of rumour was never still; and Rochester, who had long been a guilty, became at last a wretched man. His cheeks lost their colour—his eyes grew dim; and he became moody, careless, and melancholy. The king, seeing him thus, took at length no pleasure in his society, and began to look about for another favourite. George Villiers, Duke of Buckingham, was the man to his mind: quick-witted, handsome, and unscrupulous. The two latter qualities alone were sufficient to recommend him to James I. In proportion as the influence of Rochester declined, that of Buckingham increased. A falling favourite has no friends; and rumour wagged her tongue against Rochester louder and more pertinaciously than ever. A new favourite, too, generally endeavours to hasten by a kick the fall of the old one; and Buckingham, anxious to work the complete ruin of his forerunner in the king's good graces, encouraged the relatives of Sir Thomas Overbury to prosecute their inquiries into the strange death of their kinsman.

James was rigorous enough in the punishment of offences when he was not himself involved. He piqued himself, moreover, on his dexterity in unravelling mysteries. The affair of Sir Thomas Overbury found him congenial occupation. He set to work by ordering the arrest of Sir Jervis Elwes. James, at this early stage of the proceedings, does not seem to have been aware that Rochester was so deeply implicated. Struck with horror at the atrocious system of slow poisoning, the king sent for all the judges. According to Sir Anthony Weldon, he knelt down in the midst of them, and said, "My lords the judges, it is lately come to my hearing that you have now in examination a business of poisoning. Lord! in what a miserable condition shall this kingdom be (the only famous nation for hospitality in the world) if our tables should become such a snare, as that none could eat without danger of life, and that Italian custom should be introduced among us! Therefore, my lords, I charge you, as you will answer it at that great and dreadful day of judgment, that you examine it strictly, without favour, affection, or partiality. And if you shall spare any guilty of this crime, God's

curse light on you and your posterity! and if I spare any that are guilty, God's curse light on me and my posterity for ever!"



DUKE OF BUCKINGHAM.

The imprecation fell but too surely upon the devoted house of Stuart. The solemn oath was broken, and God's curse *did* light upon him and his posterity!

The next person arrested after Sir Jervis Elwes, was Weston, the under-keeper; then Franklin and Mrs. Turner; and lastly, the Earl and Countess of Somerset, to which dignity Rochester had been advanced since the death of Overbury.

Weston was first brought to trial. Public curiosity was on the stretch. Nothing else was talked of, and the court on the day of trial was crowded to suffocation. The *State Trials* report, that Lord Chief Justice Coke "laid open to the jury the baseness and cowardliness of poisoners, who attempt that secretly against which there is no means of preservation or defence for a man's life; and how rare it was to hear of any poisoning in England, so detestable it was to our nation. But the devil had taught divers to be cunning in it, so that they can poison in what distance of space they please, by consuming the *nativum calidum*, or *humidum radicale*, in one month, two or three, or more, as they list, which they four manner of ways do execute, viz. *haustu*, *gustu*, *odore*, and *contactu*."



LORD COKE.

When the indictment was read over, Weston made no other reply than “Lord have mercy upon me! Lord have mercy upon me!” On being asked how he would be tried, he refused to throw himself upon a jury of his country, and declared that he would be tried by God alone. In this he persisted for some time. The fear of the dreadful punishment for contumacy³⁸ induced him at length to plead “Not guilty,” and take his trial in due course of law.

All the circumstances against him were fully proved, and he was found guilty and executed at Tyburn. Mrs. Turner, Franklin, and Sir Jervis Elwes were also brought to trial, found guilty, and executed between the 19th of October and the 4th of December 1615; but the grand trial of the Earl and Countess of Somerset did not take place till the month of May following.

On the trial of Sir Jervis Elwes, circumstances had transpired, shewing a guilty knowledge of the poisoning on the part of the Earl of Northampton, the uncle of Lady Somerset, and the chief falconer Sir Thomas Monson. The former was dead; but Sir Thomas Monson was arrested and brought to trial. It appeared, however, that he was too dangerous a man to be brought to the scaffold. He knew too many of the odious secrets of James I., and his dying speech might contain disclosures which would compromise the king. To conceal old guilt it was necessary to incur new: the trial of Sir Thomas Monson was brought to an abrupt conclusion, and himself set at liberty.



THE EARL OF SOMERSET.

Already James had broken his oath. He now began to fear that he had been rash in engaging so zealously to bring the poisoners to punishment. That Somerset would be declared guilty there was no doubt, and that he looked for pardon and impunity was equally evident to the king. Somerset, while in the Tower, asserted confidently that James would not *dare* to bring him to trial. In this he was mistaken; but James was in an agony. What the secret was between them will now never be known with certainty; but it may be surmised. Some have imagined it to be the vice to which the king was addicted; while others have asserted that it related to the death of Prince Henry, a virtuous young man, who had held Somerset in especial abhorrence. This prince died early, unlamented by his father, and, as public opinion whispered at the time, poisoned by Somerset. Probably some crime or other lay heavy upon the soul of the king; and Somerset, his accomplice, could not be brought to public execution with safety. Hence the dreadful tortures of James when he discovered that his favourite was so deeply implicated in the murder of Overbury. Every means was taken by the agonised king to bring the prisoner into what was called a safe frame of mind. He was secretly advised to plead guilty, and trust to the clemency of the king. The same advice was conveyed to the countess. Bacon was instructed by the king to draw up a paper of all the points of “mercy and favour” to Somerset which might result from the evidence; and Somerset was again recommended to plead guilty, and promised that no evil should ensue to him.

The countess was first tried. She trembled and shed tears during the reading of the indictment, and, in a low voice, pleaded guilty. On being

asked why sentence of death should not be passed against her, she replied meekly, "I can much aggravate, but nothing extenuate my fault. I desire mercy, and that the lords will intercede for me with the king." Sentence of death was passed upon her.

Next day the earl was brought to trial. He appears to have mistrusted the promises of James, and he pleaded not guilty. With a self-possession and confidence which he felt, probably, from his knowledge of the king's character, he rigorously cross-examined the witnesses, and made a stubborn defence. After a trial which lasted eleven hours he was found guilty, and condemned to the felon's death.



THE COUNTESS OF SOMERSET.

Whatever may have been the secrets between the criminal and the king, the latter, notwithstanding his terrific oath, was afraid to sign the death-warrant. It might, perchance, have been his own. The earl and countess were committed to the Tower, where they remained for nearly five years. At the end of this period, to the surprise and scandal of the community, and the disgrace of its chief magistrate, they both received the royal pardon, but were ordered to reside at a distance from the court. Having been found guilty of felony, the estates of the earl had become forfeited; but James granted him out of their revenues an income of 4000*l.* per annum! Shamelessness could go no further.

Of the after-life of these criminals nothing is known, except that the love they had formerly borne each other was changed into aversion, and that they lived under the same roof for months together without the interchange of a word.

The exposure of their atrocities did not put a stop to the practice of poisoning. On the contrary, as we shall see hereafter, it engendered that insane imitation which is so strange a feature of the human character. James himself is supposed, with great probability, to have fallen a victim to it. In the notes to Harris's *Life and Writings of James I.*, there is a good deal of information on the subject. The guilt of Buckingham, although not fully established, rests upon circumstances of suspicion stronger than have been sufficient to lead hundreds to the scaffold. His motives for committing the crime are stated to have been a desire of revenge for the coldness with which the king, in the latter years of his reign, began to regard him; his fear that James intended to degrade him; and his hope that the great influence he possessed over the mind of the heir-apparent would last through a new reign, if the old one were brought to a close.

In the second volume of the *Harleian Miscellany*, there is a tract, entitled the *Forerunner of Revenge*, written by George Eglisam, doctor of medicine, and one of the physicians to King James. Harris, in quoting it, says that it is full of rancour and prejudice. It is evidently exaggerated, but forms nevertheless a link in the chain of evidence. Eglisam says, "The king being sick of an ague, the duke took this opportunity, when all the king's doctors of physic were at dinner, and offered to him a white powder to take, the which he a long time refused; but, overcome with his flattering importunity, he took it in wine, and immediately became worse and worse, falling into many swoonings and pains, and violent fluxes of the belly, so tormented, that his majesty cried out aloud of this white powder, 'Would to God I had never taken it!'" He then tells us "of the Countess of Buckingham (the duke's mother) applying the plaister to the king's heart and breast, whereupon he grew faint and short-breathed, and in agony; that the physicians exclaimed that the king was poisoned; that Buckingham commanded them out of the room, and committed one of them close prisoner to his own chamber, and another to be removed from court; and that, after his majesty's death, his body and head swelled above measure;

his hair, with the skin of his head, stuck to his pillow, and his nails became loose on his fingers and toes.” Clarendon, who, by the way, was a partisan of the duke’s, gives a totally different account of James’s death. He says, “It was occasioned by an ague (after a short indisposition by the gout), which, meeting many humours in a fat unwieldy body of fifty-eight years old, in four or five fits carried him out of the world,—after whose death many scandalous and libellous discourses were raised, without the least colour or ground, as appeared upon the strictest and most malicious examination that could be made, long after, in a time of license, when nobody was afraid of offending majesty, and when prosecuting the highest reproaches and contumelies against the royal family was held very meritorious.” Notwithstanding this confident declaration, the world will hardly be persuaded that there was not some truth in the rumours that were abroad. The inquiries which were instituted were not strict, as he asserts, and all the unconstitutional influence of the powerful favourite was exerted to defeat them. In the celebrated accusations brought against Buckingham by the Earl of Bristol, the poisoning of King James was placed last on the list; and the pages of history bear evidence of the summary mode in which they were, for the time, got rid of.

The man from whom Buckingham is said to have procured his poisons was one Dr. Lamb, a conjuror and empiric, who, besides dealing in poisons, pretended to be a fortune-teller. The popular fury, which broke with comparative harmlessness against his patron, was directed against this man, until he could not appear with safety in the streets of London. His fate was melancholy. Walking one day in Cheapside, disguised, as he thought, from all observers, he was recognised by some idle boys, who began to hoot and pelt him with stones, calling out, “The poisoner! the poisoner! Down with the wizard! down with him!” A mob very soon collected, and the doctor took to his heels and ran for his life. He was pursued and seized in Wood Street, and from thence dragged by the hair

through the mire to St. Paul's Cross; the mob beating him with sticks and stones, and calling out, "Kill the wizard! kill the poisoner!"



PAUL'S CROSS; SEVENTEENTH CENTURY.

Charles I., on hearing of the riot, rode from Whitehall to quell it; but he arrived too late to save the victim. Every bone in his body was broken, and he was quite dead. Charles was excessively indignant, and fined the city six hundred pounds for its inability to deliver up the ring-leaders to justice.

But it was in Italy that poisoning was most prevalent. From a very early period, it seems to have been looked upon in that country as a perfectly justifiable means of getting rid of an enemy. The Italians of the sixteenth and seventeenth centuries poisoned their opponents with as little compunction as an Englishman of the present day brings an action at law against any one who has done him an injury. The writings of contemporary authors inform us that, when La Spara and La Tophania carried on their infernal trade, ladies put poison-bottles on their dressing-tables as openly, and used them with as little scruple upon others, as modern dames use *Eau de Cologne* or lavender-water upon themselves. So powerful is the influence of fashion, it can even cause murder to be regarded as a venial peccadillo.

In the memoirs of the last Duke of Guise, who made a Quixotic attempt, in 1648, to seize upon the government of Naples, we find some curious particulars relative to the popular feeling with regard to poisoning. A man named Gennaro Annese, who, after the short and extraordinary career of Masaniello the fisherman, had established himself as a sort of captain-

general of the populace, rendered himself so obnoxious to the Duke of Guise, that the adherents of the latter determined to murder him. The captain of the guard, as the duke himself very coolly informs us, was requested to undertake this office. It was suggested to him that the *poniard* would be the most effectual instrument, but the man turned up his eyes with pious horror at the proposition. He was ready to *poison* Gennaro Annese whenever he might be called upon to do so; but to *poniard* him, he said, would be disgraceful, and unbecoming an officer of the guards! At last, poison was agreed upon, and Augustino Molla, an attorney in the duke's confidence, brought the bottle containing the liquid to shew it to his master. The following is the Duke's own account:

“Augustino came to me at night, and told me: ‘I have brought you something which will free you from Gennaro. He deserves death, and it is no great matter after what fashion justice is done upon him. Look at this vial, full of clear and beautiful water: in four days' time, it will punish all his treasons. The captain of the guard has undertaken to give it him; and as it has no taste at all, Gennaro will suspect nothing.’”

The duke further informs us that the dose was duly administered; but that Gennaro, fortunately for himself, ate nothing for dinner that day but cabbage dressed with oil, which acting as an antidote, caused him to vomit profusely, and saved his life. He was exceedingly ill for five days, but never suspected that he had been poisoned.

In process of time, poison-vending became a profitable trade. Eleven years after this period, it was carried on at Rome to such an extent, that the sluggish government was roused to interference. Beckmann, in his *History of Inventions*, and Leuret, in his *Magazin zum Gebrauche der Staaten Kirche Geschichte*, or *Magazine of Materials for a History of a State Church*, relates that, in the year 1659, it was made known to Pope Alexander VII. that great numbers of young women had avowed in the

confessional that they had poisoned their husbands with slow poisons. The Catholic clergy, who in general hold the secrets of the confessional so sacred, were shocked and alarmed at the extraordinary prevalence of the crime. Although they refrained from revealing the names of the penitents, they conceived themselves bound to apprise the head of the Church of the enormities that were practised. It was also the subject of general conversation in Rome that young widows were unusually abundant. It was remarked, too, that if any couple lived unhappily together, the husband soon took ill and died. The papal authorities, when once they began to inquire, soon learned that a society of young wives had been formed, and met nightly, for some mysterious purpose, at the house of an old woman named Hieronyma Spara. This hag was a reputed witch and fortune-teller, and acted as president of the young viragos, several of whom, it was afterwards ascertained, belonged to the first families of Rome.

In order to have positive evidence of the practices of this female conclave, a lady was employed by the government to seek an interview with them. She dressed herself out in the most magnificent style; and having been amply provided with money, she found but little difficulty, when she had stated her object, of procuring an audience of La Spara and her sisterhood. She pretended to be in extreme distress of mind on account of the infidelities and ill-treatment of her husband, and implored La Spara to furnish her with a few drops of the wonderful elixir, the efficacy of which in sending cruel husbands to “their last long sleep” was so much vaunted by the ladies of Rome. La Spara fell into the snare, and sold her some of her “drops” at a price commensurate with the supposed wealth of the purchaser.

The liquor thus obtained was subjected to an analysis, and found to be, as was suspected, a slow poison; clear, tasteless, and limpid, like that spoken of by the Duke of Guise. Upon this evidence, the house was surrounded by the police, and La Spara and her companions taken into custody. La Spara, who is described as having been a little ugly old woman,

was put to the torture, but obstinately refused to confess her guilt. Another of the women, named La Gratiosa, had less firmness, and laid bare all the secrets of the infernal sisterhood. Taking a confession extorted by anguish on the rack at its true value (nothing at all), there is still sufficient evidence to warrant posterity in the belief of their guilt. They were found guilty, and condemned, according to their degrees of culpability, to various punishments. La Spara, Gratiosa, and three young women, who had poisoned their husbands, were hanged together at Rome. Upwards of thirty women were whipped publicly through the streets; and several, whose high rank screened them from more degrading punishment, were banished from the country, and mulcted in heavy fines. In a few months afterwards, nine women more were hanged for poisoning; and another bevy, including many young and beautiful girls, were whipped half naked through the streets of Rome.

This severity did not put a stop to the practice, and jealous women and avaricious men, anxious to step into the inheritance of fathers, uncles, or brothers, resorted to poison. As it was quite free from taste, colour, and smell, it was administered without exciting suspicion. The skilful vendors compounded it of different degrees of strength, so that the poisoners had only to say whether they wanted their victims to die in a week, a month, or six months, and they were suited with corresponding doses. The vendors were chiefly women, of whom the most celebrated was a hag named Tophania, who was in this way accessory to the death of upwards of six hundred persons. This woman appears to have been a dealer in poisons from her girlhood, and resided first at Palermo and then at Naples. That entertaining traveller, Father Lebat, has given, in his letters from Italy, many curious particulars relating to her. When he was at Civita Vecchia, in 1719, the Viceroy of Naples discovered that poison was extensively sold in the latter city, and that it went by the name of *aqueta*, or little-water. On making further inquiry, he ascertained that Tophania (who was by this time near seventy years of age, and who seems to have begun her evil

courses very soon after the execution of La Spara,) sent large quantities of it to all parts of Italy in small vials, with the inscription, "Manna of St. Nicholas of Barri."

The tomb of St. Nicholas of Barri was celebrated throughout Italy. A miraculous oil was said to ooze from it, which cured nearly all the maladies that flesh is heir to, provided the recipient made use of it with the due degree of *faith*. La Tophania artfully gave this name to her poison to elude the vigilance of the custom-house officers, who, in common with every body else, had a pious respect for St. Nicholas de Barri and his wonderful oil.

The poison was similar to that manufactured by La Spara. Hahnemann the physician, and father of the homœopathic doctrine, writing upon this subject, says it was compounded of arsenical neutral salts, occasioning in the victim a gradual loss of appetite, faintness, gnawing pains in the stomach, loss of strength, and wasting of the lungs. The Abbé Gagliardi says, that a few drops of it were generally poured into tea, chocolate, or soup, and its effects were slow, and almost imperceptible. Garelli, physician to the Emperor of Austria, in a letter to Hoffmann, says it was crystallised arsenic, dissolved in a large quantity of water by decoction, with the addition (for some unexplained purpose) of the herb *cymbalaria*. The Neapolitans called it *Aqua Toffnina*; and it became notorious all over Europe under the name of *Aqua Tophania*.

Although this woman carried on her infamous traffic so extensively, it was extremely difficult to meet with her. She lived in continual dread of discovery. She constantly changed her name and residence; and pretending to be a person of great godliness, resided in monasteries for months together. Whenever she was more than usually apprehensive of detection she sought ecclesiastical protection. She was soon apprised of the search made for her by the Viceroy of Naples, and, according to her practice, took refuge in a monastery. Either the search after her was not very rigid, or her measures were exceedingly well taken; for she contrived to elude the

vigilance of the authorities for several years. What is still more extraordinary, as shewing the ramifications of her system, her trade was still carried on to as great an extent as before. Lebat informs us that she had so great a sympathy for poor wives who hated their husbands and wanted to get rid of them, but could not afford to buy her wonderful *aqua*, that she made them presents of it.

She was not allowed, however, to play at this game for ever; she was at length discovered in a nunnery, and her retreat cut off. The viceroy made several representations to the superior to deliver her up, but without effect. The abbess, supported by the archbishop of the diocese, constantly refused. The public curiosity was in consequence so much excited at the additional importance thus thrust upon the criminal, that thousands of persons visited the nunnery in order to catch a glimpse of her.

The patience of the viceroy appears to have been exhausted by these delays. Being a man of sense, and not a very zealous Catholic, he determined that even the Church should not shield a criminal so atrocious. Setting the privileges of the nunnery at defiance, he sent a troop of soldiers, who broke over the walls, and carried her away *vi et armis*. The archbishop, Cardinal Pignatelli, was highly indignant, and threatened to excommunicate and lay the whole city under interdict. All the inferior clergy, animated by the *esprit du corps*, took up the question, and so worked upon the superstitious and bigoted people, that they were ready to rise in a mass to storm the palace of the viceroy and rescue the prisoner.

These were serious difficulties; but the viceroy was not a man to be daunted. Indeed, he seems to have acted throughout with a rare union of astuteness, coolness, and energy. To avoid the evil consequences of the threatened excommunication, he placed a guard round the palace of the archbishop, judging that the latter would not be so foolish as to launch out an anathema which would cause the city to be starved, and himself in it. The market-people would not have dared to come to the city with provisions so long as it remained under the ban. There would have been

too much inconvenience to himself and his ghostly brethren in such a measure; and, as the viceroy anticipated, the good cardinal reserved his thunders for some other occasion.

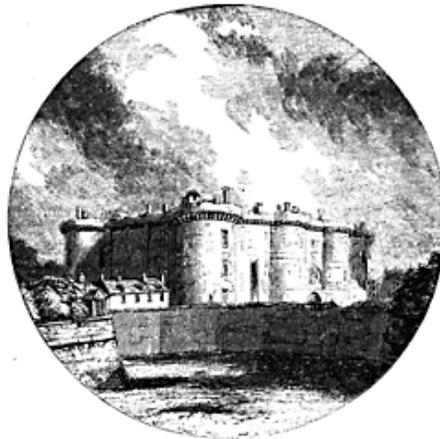
Still there was the populace. To quiet their clamour and avert the impending insurrection, the agents of the government adroitly mingled with the people, and spread abroad a report that Tophania had poisoned all the wells and fountains of the city. This was enough. The popular feeling was turned against her immediately. Those who, but a moment before, had looked upon her as a saint, now reviled her as a devil, and were as eager for her punishment as they had before been for her escape. Tophania was then put to the torture. She confessed the long catalogue of her crimes, and named all the persons who had employed her. She was shortly afterwards strangled, and her corpse thrown over the wall into the garden of the convent from whence she had been taken. This appears to have been done to conciliate the clergy, by allowing them, at least, the burial of one who had taken refuge within their precincts.

After her death the mania for poisoning seems to have abated; but we have yet to see what hold it took upon the French people at a somewhat earlier period. So rooted had it become in France between the years 1670 and 1680, that Madame de Sevigné, in one of her letters, expresses her fear that Frenchman and poisoner would become synonymous terms.

As in Italy, the first notice the government received of the prevalence of this crime was given by the clergy, to whom females of high rank, and some among the middle and lower classes, had avowed in the confessional that they had poisoned their husbands. In consequence of these disclosures, two Italians, named Exili and Glaser, were arrested, and thrown into the Bastille, on the charge of compounding and selling the drugs used for these murders. Glaser died in prison, but Exili remained without trial for several months; and there, shortly afterwards, he made the acquaintance of another prisoner, named Sainte Croix, by whose example the crime was still further disseminated among the French people.

The most notorious of the poisoners that derived their pernicious knowledge from this man was Madame de Brinvilliers, a young woman connected both by birth and marriage with some of the noblest families of France. She seems, from her very earliest years, to have been heartless and depraved; and, if we may believe her own confession, was steeped in wickedness ere she had well entered her teens. She was, however, beautiful and accomplished; and, in the eye of the world, seemed exemplary and kind. Guyot de Pitaval, in the *Causes Célèbres*, and Madame de Sevigné, in her letters, represent her as mild and agreeable in her manners, and offering no traces on her countenance of the evil soul within. She was married in 1651 to the Marquis de Brinvilliers, with whom she lived unhappily for some years. He was a loose, dissipated character, and was the means of introducing Sainte Croix to his wife, a man who cast a blight upon her life, and dragged her on from crime to crime, till her offences became so great that the mind shudders to dwell upon them. For this man she conceived a guilty passion, to gratify which she plunged at once into the gulf of sin. She was drawn to its most loathsome depths ere retribution overtook her.

She had as yet shewn a fair outside to the world, and found but little difficulty in effecting a legal separation from her husband, who had not the art to conceal his vices. The proceeding gave great offence to her family. She appears, after this, to have thrown off the mask completely, and carried on her intrigues so openly with her lover, Sainte Croix, that her father, M. D'Aubray, scandalised at her conduct, procured a *lettre de cachet*, and had him imprisoned in the Bastille for a twelvemonth.



THE BASTILLE.

Sainte Croix, who had been in Italy, was a dabbler in poisons. He knew something of the secrets of the detestable La Spara, and improved himself in them from the instructions of Exili, with whom he speedily contracted a sort of friendship. By him he was shewn how to prepare, not only the liquid poisons employed in Italy, but that known as *succession powder*, which afterwards became so celebrated in France. Like his mistress, he appeared amiable, witty, and intelligent, and shewed no signs to the world of the two fierce passions, revenge and avarice, which were gnawing at his heart. Both these passions were to be sated on the unfortunate family of D'Aubray; his revenge, because they had imprisoned him; and his avarice, because they were rich. Reckless and extravagant, he was always in want of money, and he had no one to supply him but Madame de Brinvilliers, whose own portion was far from sufficient to satisfy his need. Groaning to think that any impediment should stand between him and wealth, he conceived the horrid idea of poisoning M. D'Aubray her father, and her two brothers, that she might inherit the property. Three murders were nothing to such a villain. He communicated his plan to Madame de Brinvilliers; and she, without the slightest scruple, agreed to aid him: he undertook to compound the poisons, and she to administer them. The zeal and alacrity with which she set to work seem hardly credible. Sainte Croix found her an apt scholar; and she soon became as expert as himself in the manufacture of poisons.

To try the strength of the first doses, she used to administer them to dogs, rabbits, and pigeons. Afterwards, wishing to be more certain of their effects, she went round to the hospitals, and administered them to the sick poor in the soups which she brought in apparent charity.³⁹ None of the poisons were intended to kill at the first dose; so that she could try them once upon an individual without fear of murder. She tried the same atrocious experiment upon the guests at her father's table, by poisoning a pigeon-pie! To be more certain still, she next poisoned herself! When convinced by this desperate essay of the potency of the draught, she procured an antidote from Sainte Croix, and all doubts being removed, commenced operations upon her grey-headed father. She administered the first dose with her own hands, in his chocolate. The poison worked well. The old man was taken ill, and his daughter, apparently full of tenderness and anxiety, watched by his bedside. The next day she gave him some broth, which she recommended as highly nourishing. This also was poisoned. In this manner she gradually wore out his frame, and in less than ten days he was a corpse! His death seemed so much the result of disease, that no suspicions were excited.

When the two brothers arrived from the provinces to render the last sad duties to their sire, they found their sister as grieved, to all outward appearance, as even filial affection could desire: but the young men only came to perish. They stood between Sainte Croix and the already half-clutched gold, and their doom was sealed. A man, named La Chaussée, was hired by Sainte Croix to aid in administering the poisons; and, in less than six weeks time, they had both gone to their long home.

Suspicion was now excited; but so cautiously had all been done, that it found no one upon whom to attach itself. The marquise had a sister, and she was entitled, by the death of her relatives, to half the property. Less than the whole would not satisfy Sainte Croix, and he determined that she should die the same death as her father and brothers. She was too

distrustful, however; and, by quitting Paris, she escaped the destruction that was lurking for her.

The marquise had undertaken these murders to please her lover. She was now anxious to perpetrate another on her own account. She wished to marry Sainte Croix; but, though separated from her husband, she was not divorced. She thought it would be easier to poison him than to apply to the tribunals for a divorce, which might, perhaps, be refused. But Sainte Croix had no longer any love for his guilty instrument. Bad men do not admire others who are as bad as themselves. Though a villain himself, he had no desire to marry one, and was not at all anxious for the death of the marquis. He seemed, however, to enter into the plot, and supplied her with poison for her husband; but he took care to provide a remedy. La Brinvilliers poisoned him one day, and Sainte Croix gave him an antidote the next. In this manner he was buffeted about between them for some time, and finally escaped, with a ruined constitution and a broken heart.

But the day of retribution was at hand, and a terrible mischance brought the murders to light. The nature of the poisons compounded by Sainte Croix was so deadly, that, when working in his laboratory, he was obliged to wear a mask, to preserve himself from suffocation. One day, the mask slipped off, and the miserable wretch perished in his crimes. His corpse was found, on the following morning, in the obscure lodging where he had fitted up his laboratory. As he appeared to be without friends or relatives, the police took possession of his effects. Among other things, was found a small box, to which was affixed the following singular document:

“I humbly beg, that those into whose hands this box may fall, will do me the favour to deliver it into the hands only of the Marchioness de Brinvilliers, who resides in the Rue Neuve St. Paul, as every thing it contains concerns her, and belongs to her alone; and as, besides, there is nothing in it that can be of use to any person but her. In case she shall be dead before me, it is my wish that it be burned, with every

thing it contains, without opening or altering any thing. In order that no one may plead ignorance, I swear by the God that I adore, and by all that is held most sacred, that I assert nothing but the truth: and if my intentions, just and reasonable as they are, be thwarted in this point by any persons, I charge their consciences with it, both in this world and that which is to come, in order that I may unload mine. I protest that this is my last will. Done at Paris, May 25, 1672.

(Signed) SAINTE CROIX.”

This earnest solicitation, instead of insuring respect, as was intended, excited curiosity. The box was opened, and found to contain some papers, and several vials and powders. The latter were handed to a chemist for analysis, and the documents were retained by the police, and opened. Among them was found a promissory note of the Marchioness de Brinvilliers, for thirty thousand francs, to the order of Sainte Croix. The other papers were of greater importance, as they implicated both her and her servant, La Chaussée, in the recent murders. As soon as she was informed of the death of Sainte Croix, she made an attempt to gain possession of his papers and the box; but, being refused, she saw that there was no time to be lost, and immediately quitted. Next morning the police were on her trail; but she succeeded in escaping to England. La Chaussée was not so fortunate. Altogether ignorant of the fatal mischance which had brought his villanies to light, he did not dream of danger. He was arrested and brought to trial: being put to the torture, he confessed that he had administered poison to the Messieurs d’Aubray, and that he had received a hundred pistoles, and the promise of an annuity for life, from Sainte Croix and Madame de Brinvilliers, for the job. He was condemned to be broken alive on the wheel, and the marchioness was, by default, sentenced to be beheaded. He was executed accordingly, in March 1673, on the Place de Grève, in Paris.

La Brinvilliers appears to have resided for nearly three years in England. Early in 1676, thinking that the rigour of pursuit was over, and that she might venture to return to the Continent, she proceeded secretly to Liège. Notwithstanding her care, the French authorities were soon apprised of her return; and arrangements were promptly made with the municipality of that city to permit the agents of the French police to arrest her within the limits of their jurisdiction. Desgrais, an officer of the *maréchaussée*, accordingly left Paris for that purpose. On his arrival in Liège, he found that she had sought shelter within the walls of a convent. Here the arm of the law, long as it is said to be, could not reach her: but Desgrais was not a man to be baffled, and he resorted to stratagem to accomplish what force could not. Having disguised himself as a priest, he sought admission to the convent, and obtained an interview with La Brinvilliers. He said, that being a Frenchman, and passing through Liège, he could not leave that city without paying a visit to a lady whose beauty and misfortunes were so celebrated. Her vanity was flattered by the compliment. Desgrais saw, to use a vulgar but forcible expression, “that he had got on the blind side of her;” and he adroitly continued to pour out the language of love and admiration till the deluded marchioness was thrown completely off her guard. She agreed, without much sollicitation, to meet him outside the walls of the convent, where their amorous intrigue might be carried on more conveniently than within. Faithful to her appointment with her supposed new lover, she came, and found herself, not in the embrace of a gallant, but in the custody of a policeman.

Her trial was not long delayed. The proofs against her were abundant. The dying declaration of La Chaussée would have been alone enough to convict her; but besides that, there were the mysterious document attached to the box of St. Croix, her flight from France, and, stronger and more damning proof than all, a paper, in her own handwriting, found among the effects of St. Croix, in which she detailed to him the misdeeds of her life, and spoke of the murder of her father and brothers in terms that left no

doubt of her guilt. During the trial, all Paris was in commotion. La Brinvilliers was the only subject of conversation. All the details of her crimes were published, and greedily devoured; and the idea of secret poisoning first put into the heads of hundreds, who afterwards became guilty of it.

On the 16th of July, 1676, the Superior Criminal Court of Paris pronounced a verdict of guilty against her, for the murder of her father and brothers, and the attempt upon the life of her sister. She was condemned to be drawn on a hurdle, with her feet bare, a rope about her neck, and a burning torch in her hand, to the great entrance of the cathedral of Notre Dame, where she was to make the *amende honorable* in sight of all the people; to be taken from thence to the Place de Grève, and there to be beheaded. Her body was afterwards to be burned, and her ashes scattered to the winds.

After her sentence, she made a full confession of her guilt. She seems to have looked upon death without fear; but it was recklessness, not courage, that supported her. Madame de Sevigné says, that when on the hurdle, on her way to the scaffold, she entreated her confessor to exert his influence with the executioner to place himself next to her, that his body might hide from her view “that scoundrel Desgrais, who had entrapped her.” She also asked the ladies, who had been drawn to their windows to witness the procession, what they were looking at? adding, “a pretty sight you have come to see, truly!” She laughed when on the scaffold, dying as she had lived, impenitent and heartless. On the morrow, the populace came in crowds to collect her ashes to preserve them as relics. She was regarded as a martyred saint, and her ashes were supposed to be endowed, by divine grace, with the power of curing all diseases. Popular folly has often canonised persons whose pretensions to sanctity were extremely equivocal; but the disgusting folly of the multitude, in this instance, has never been surpassed.

Before her death, proceedings were instituted against M. de Penautier, treasurer of the province of Languedoc, and receiver-general for the clergy, who was accused by a lady, named St. Laurent, of having poisoned her husband, the late receiver-general, in order to obtain his appointment. The circumstances of this case were never divulged, and the greatest influence was exerted to prevent it from going to trial. He was known to have been intimate with Sainte Croix and Madame de Brinvilliers, and was thought to have procured his poisons from them. The latter, however, refused to say any thing which might implicate him. The inquiry was eventually stifled, after Penautier had been several months in the Bastille.

The Cardinal de Bonzy was accused by the gossips of the day of being an accomplice of Penautier. The cardinal's estates were burdened with the payment of several heavy annuities; but, about the time that poisoning became so fashionable, all the annuitants died off, one after the other. The cardinal, in talking of these annuitants, afterwards used to say, "Thanks to my star, I have outlived them all!" A wit, seeing him and Penautier riding in the same carriage, cried out, in allusion to this expression, "There go the Cardinal de Bonzy and his *star!*"

It was now that the mania for poisoning began to take hold of the popular mind. From this time until the year 1682, the prisons of France teemed with persons accused of this crime; and it is very singular that other offences decreased in a similar proportion. We have already seen the extent to which it was carried in Italy. It was, if possible, surpassed in France. The diabolical ease with which these murders could be effected, by means of these scentless and tasteless poisons, enticed the evil-minded. Jealousy, revenge, avarice, even petty spite, alike resorted to them. Those who would have been deterred, by fear of detection, from using the pistol or the dagger, or even strong doses of poison, which kill at once, employed slow poisons without dread. The corrupt government of the day, although it could wink at the atrocities of a wealthy and influential courtier like Penautier, was scandalised to see the crime spreading among the people.

Disgrace was, in fact, entailed, in the eyes of Europe, upon the name of Frenchman. Louis XIV., to put a stop to the evil, instituted what was called the *Chambre Ardente*, or Burning Chamber, with extensive powers for the trial and punishment of the prisoners.

Two women, especially, made themselves notorious at this time, and were instrumental to the deaths of hundreds of individuals. They both resided in Paris, and were named Lavoisin and Lavigoreux. Like Spara and Tophania, of whom they were imitators, they chiefly sold their poisons to women who wanted to get rid of their husbands; and, in some few instances, to husbands who wanted to get rid of their wives. Their ostensible occupation was that of midwives. They also pretended to be fortune-tellers, and were visited by persons of every class of society. The rich and poor thronged alike to their *mansardes* to learn the secrets of the future. Their prophecies were principally of death. They foretold to women the approaching dissolution of husbands, and to needy heirs the end of rich relatives, who had made them, as Byron expresses it, “wait too, too long already.” They generally took care to be instrumental in fulfilling their own predictions. They used to tell their wretched employers that some sign of the approaching death would take place in the house, such as the breaking of glass or china; and they paid servants considerable fees to cause a breakage, as if by accident, exactly at the appointed time. Their occupation as midwives made them acquainted with the secrets of many families, which they afterwards turned to dreadful account.

It is not known how long they had carried on this awful trade before they were discovered. Detection finally overtook them at the close of the year 1679. They were both tried, found guilty, and burned alive on the *Place de Grève*, on the 22d of February, 1680, after their hands had been bored through with a red-hot iron, and then cut off. Their numerous accomplices in Paris and in the provinces were also discovered and brought to trial. According to some authors, thirty, and to others, fifty of them, chiefly women, were hanged in the principal cities.

Lavoisin kept a list of the visitors who came to her house to purchase poisons. This paper was seized by the police on her arrest, and examined by the tribunals. Among the names were found those of the Marshal de Luxembourg, the Countess de Soissons, and the Duchess de Bouillon. The marshal seems only to have been guilty of a piece of discreditable folly in visiting a woman of this description, but the popular voice at the time imputed to him something more than folly. The author of the *Memoirs of the Affairs of Europe since the Peace of Utrecht*, says, "The miserable gang who dealt in poison and prophecy alleged that he had sold himself to the devil, and that a young girl of the name of Dupin had been poisoned by his means. Among other stories, they said he had made a contract with the devil, in order to marry his son to the daughter of the Marquis of Louvois. To this atrocious and absurd accusation the marshal, who had surrendered himself at the Bastille on the first accusation against him, replied with the mingled sentiment of pride and innocence, 'When Mathieu de Montmorenci, my ancestor, married the widow of Louis le Gros, he did not have recourse to the devil, but to the states-general, in order to obtain for the minor king the support of the house of Montmorenci.' This brave man was imprisoned in a cell six feet and a half long, and his trial, which was interrupted for several weeks, lasted altogether fourteen months. No judgment was pronounced upon him."

The Countess of Soissons fled to Brussels, rather than undergo the risk of a trial; and was never able to clear herself from the stigma that attached to her, of having made an attempt to poison the Queen of Spain by doses of succession-powder. The Duchess of Bouillon was arrested, and tried by the *Chambre Ardente*. It would appear, however, that she had nothing to do with the slow poisons, but had merely endeavoured to pry into the secrets of futurity, and gratify her curiosity with a sight of the devil. One of the presidents of the *Chambre*, La Reynie, an ugly little old man, very seriously asked her whether she had really seen the devil; to which the lady replied, looking him full in the face, "Oh, yes! I see him now. He is in the form of a

little ugly old man, exceedingly illnatured, and is dressed in the robes of a Counsellor of State.” M. la Reynie prudently refrained from asking any more questions of a lady with so sharp and ready a tongue. The duchess was imprisoned for several months in the Bastille; and nothing being proved against her, she was released at the intercession of her powerful friends. The severe punishment of criminals of this note might have helped to abate the fever of imitation among the vulgar;—their comparative impunity had a contrary tendency. The escape of Penautier, and the wealthy Cardinal de Bonzy his employer, had the most pernicious effect. For two years longer the crime continued to rage, and was not finally suppressed till the stake had blazed, or the noose dangled, for upwards of a hundred individuals.⁴⁰



PALACE OF WOODSTOCK.

HAUNTED HOUSES.

Here's a knocking indeed!... Knock! knock! knock!... Who's there, i' the name o' Beelzebub?... Who's there, i' the devil's name? Knock! knock! knock!—Never at quiet?—*Macbeth*.

WHO has not either seen or heard of some house, shut up and uninhabitable, fallen into decay, and looking dusty and dreary, from which, at midnight, strange sounds have been heard to issue—aerial knockings—the rattling of chains, and the groaning of perturbed spirits?—a house that people have thought it unsafe to pass after dark, and which has remained for years without a tenant, and which no tenant would occupy, even were he paid to do so? There are hundreds of such houses in England at the present day; hundreds in France, Germany, and almost every country of Europe, which are marked with the mark of fear—places for the timid to avoid, and the pious to bless themselves at, and ask protection from, as they pass—the abodes of ghosts and evil spirits. There are many such houses in London; and if any vain boaster of the march of intellect would but take the trouble to find them out and count them, he would be convinced that intellect must yet make some enormous strides before such old superstitions can be eradicated.

The idea that such houses exist is a remnant of the witch creed, which merits separate notice from its comparative harmlessness, and from its being not so much a madness as a folly of the people. Unlike other notions that sprang from the belief in witchcraft, and which we have already dwelt upon at sufficient length, it has sent no wretches to the stake or the gibbet, and but a few to the pillory only.

Many houses have been condemned as haunted, and avoided by the weak and credulous, from circumstances the most trifling in themselves,

and which only wanted a vigorous mind to clear up, at once, and dissipate all alarm. A house in Aix-la-Chapelle, a large desolate-looking building, remained uninhabited for five years, on account of the mysterious knockings that there were heard within it at all hours of the day and night. Nobody could account for the noises; and the fear became at last so excessive, that the persons who inhabited the houses on either side relinquished their tenancy, and went to reside in other quarters of the town, where there was less chance of interruption from evil spirits. From being so long without an inhabitant, the house at last grew so ruinous, so dingy, and so miserable in its outward appearance, and so like the place that ghosts might be supposed to haunt, that few persons cared to go past it after sunset. The knocking that was heard in one of the upper rooms was not very loud, but it was very regular. The gossips of the neighbourhood asserted that they often heard groans from the cellars, and saw lights moved about from one window to another immediately after the midnight bell had tolled. Spectres in white habiliments were reported to have gibed and chattered from the windows; but all these stories could bear no investigation. The knocking, however, was a fact which no one could dispute, and several ineffectual attempts were made by the proprietor to discover the cause. The rooms were sprinkled with holy water; the evil spirits were commanded in due form, by a priest, to depart thence to the Red Sea; but the knockings still continued, in spite of all that could be done in that way. Accident at last discovered the cause, and restored tranquillity to the neighbourhood. The proprietor, who suffered not only in his mind but in his pocket, had sold the building at a ruinously small price, to get rid of all future annoyance. The new proprietor was standing in a room on the first floor when he heard the door driven to at the bottom with a considerable noise, and then fly open immediately, about two inches and no more. He stood still a minute and watched, and the same thing occurred a second and a third time. He examined the door attentively, and all the mystery was unravelled. The latch of the door was broken, so that it could

not be fastened, and it swung chiefly upon the bottom hinge. Immediately opposite was a window, in which one pane of glass was broken; and when the wind was in a certain quarter, the draught of air was so strong that it blew the door to with some violence. There being no latch, it swung open again; and when there was a fresh gust, was again blown to. The new proprietor lost no time in sending for a glazier, and the mysterious noises ceased for ever. The house was replastered and repainted, and once more regained its lost good name. It was not before two or three years, however, that it was thoroughly established in popular favour; and many persons, even then, would always avoid passing it, if they could reach their destination by any other street.

A similar story is narrated by Sir Walter Scott, in his *Letters on Demonology and Witchcraft*, the hero of which was a gentleman of birth and distinction, well known in the political world. Shortly after he succeeded to his title and estates, there was a rumour among the servants concerning a strange noise that used to be heard at night in the family mansion, and the cause of which no one could ascertain. The gentleman resolved to discover it himself, and to watch for that purpose with a domestic who had grown old in the family, and who, like the rest, had whispered strange things about the knocking having begun immediately upon the death of his old master. These two watched until the noise was heard, and at last traced it to a small store-room, used as a place for keeping provisions of various kinds for the family, and of which the old butler had the key. They entered this place, and remained for some time without hearing the noises which they had traced thither. At length the sound was heard, but much lower than it seemed to be while they were farther off, and their imaginations were more excited. They then discovered the cause without difficulty. A rat, caught in an old-fashioned trap, had occasioned the noise by its efforts to escape, in which it was able to raise the trap-door of its prison to a certain height, but was then obliged to drop it. The noise of the fall resounding through the house had

occasioned the mysterious rumours, which, but for the investigation of the proprietor, would, in all probability, have acquired so bad a name for the dwelling that no servants would have inhabited it. The circumstance was told to Sir Walter Scott by the gentleman to whom it happened.



SAINT LOUIS.

But, in general, houses that have acquired this character have been more indebted for it to the roguery of living men than to accidents like these. Six monks played off a clever trick of the kind upon that worthy king, Louis, whose piety has procured him in the annals of his own country the designation of “the Saint.” Having heard his confessor speak in terms of warm eulogy of the goodness and learning of the monks of the order of St. Bruno, he expressed his wish to establish a community of them near Paris. Bernard de la Tour, the superior, sent six of the brethren, and the king gave them a handsome house to live in in the village of Chantilly. It so happened that from their windows they had a very fine view of the ancient palace of Vauvert, which had been built for a royal residence by King Robert, but deserted for many years. The worthy monks thought the palace would just suit them; but their modesty was so excessive that they were ashamed to ask the king for a grant of it in due form. This difficulty was not to be overcome, and the monks set their ingenuity to work to discover another plan. The palace of Vauvert had never laboured under any imputation upon

its character until they became its neighbours; but, somehow or other, it almost immediately afterwards began to acquire a bad name. Frightful shrieks were heard to proceed from it at night; blue, red, and green lights were suddenly seen to glimmer from the windows, and as suddenly to disappear; the clanking of chains was heard, and the howling as of persons in great pain. These disturbances continued for several months, to the great terror of all the country round, and even of the pious King Louis, to whom, at Paris, all the rumours were regularly carried with whole heaps of additions that accumulated on the way. At last a great spectre, clothed all in pea-green, with a long white beard and a serpent's tail, took his station regularly at midnight in the principal window of the palace, and howled fearfully, and shook his fists at the passengers. The six monks at Chantilly, to whom all these things were duly narrated, were exceedingly wrath that the devil should play such antics right opposite their dwelling, and hinted to the commissioners sent down by Saint Louis to investigate the matter, that if they were allowed to inhabit the palace, they would very soon make a clearance of the evil spirits. The king was quite charmed with their piety, and expressed to them how grateful he felt for their disinterestedness. A deed was forthwith drawn up, the royal sign-manual was affixed to it, and the palace of Vauvert became the property of the monks of St. Bruno. The deed is dated 1259. The disturbances ceased immediately, the lights disappeared, and the green ghost (so said the monks) was laid at rest for ever under the waves of the Red Sea.⁴¹

In the year 1580, one Gilles Blacre had taken the lease of a house in the suburbs of Tours, but repenting him of his bargain with the landlord, Peter Piquet, he endeavoured to prevail upon him to cancel the agreement. Peter, however, was satisfied with his tenant and his terms, and would listen to no compromise. Very shortly afterwards, the rumour was spread all over Tours that the house of Gilles Blacre was haunted. Gilles himself asserted that he verily believed his house to be the general rendezvous of all the witches and evil spirits of France. The noise they made was awful, and

quite prevented him from sleeping. They knocked against the wall, howled in the chimneys, broke his window-glass, scattered his pots and pans all over his kitchen, and set his chairs and tables a dancing the whole night through. Crowds of persons assembled round the house to hear the mysterious noises: and the bricks were observed to detach themselves from the wall, and fall into the streets upon the heads of those who had not said their paternoster before coming out in the morning. These things having continued for some time, Gilles Blacre made his complaint to the Civil Court of Tours, and Peter Piquet was summoned to shew cause why the lease should not be annulled. Poor Peter could make no defence, and the court unanimously agreed that no lease could hold good under such circumstances, and annulled it accordingly, condemning the unlucky owner to all the expenses of the suit. Peter appealed to the parliament of Paris; and after a long examination, the parliament confirmed the lease. “Not,” said the judge, “because it has not been fully and satisfactorily proved that the house is troubled by evil spirits, but that there was an informality in the proceedings before the Civil Court of Tours, that rendered its decision null and of no effect.”

A similar cause was tried before the Parliament of Bourdeaux, in the year 1595, relative to a house in that city which was sorely troubled by evil spirits. The parliament appointed certain ecclesiastics to examine and report to them, and on their report in the affirmative that the house was haunted, the lease was annulled, and the tenant absolved from all payment of rent and taxes.⁴²

One of the best stories of a haunted house is that of the royal palace of Woodstock, in the year 1649, when the commissioners sent from London by the Long Parliament to take possession of it, and efface all the emblems of royalty about it, were fairly driven out by their fear of the devil, and the annoyances they suffered from a roguish cavalier, who played the imp to admiration. The commissioners, dreading at that time no devil, arrived at Woodstock on the 13th of October, 1649. They took up their lodgings in the

late king's apartments—turned the beautiful bedrooms and withdrawing-rooms into kitchens and sculleries—the council-hall into a brew-house, and made the dining-room a place to keep firewood in. They pulled down all the insignia of royal state, and treated with the utmost indignity every thing that recalled to their memory the name or the majesty of Charles Stuart. One Giles Sharp accompanied them in the capacity of clerk, and seconded their efforts, apparently with the greatest zeal. He aided them to uproot a noble old tree, merely because it was called the *King's Oak*, and tossed the fragments into the dining-room to make cheerful fires for the commissioners. During the first two days, they heard some strange noises about the house, but they paid no great attention to them. On the third, however, they began to suspect they had got into bad company; for they heard, as they thought, a supernatural dog under their bed, which gnawed their bed-clothes. On the next day, the chairs and tables began to dance, apparently of their own accord. On the fifth day, something came into the bedchamber and walked up and down; and fetching the warming-pan out of the withdrawing-room, made so much noise with it that they thought five church-bells were ringing in their ears. On the sixth day, the plates and dishes were thrown up and down the dining-room. On the seventh, they penetrated into the bedroom in company with several logs of wood, and usurped the soft pillows intended for the commissioners. On the eighth and ninth nights, there was a cessation of hostilities; but on the tenth, the bricks in the chimneys became locomotive, and rattled and danced about the floors, and round the heads of the commissioners, all the night long. On the eleventh, the demon ran away with their breeches; and on the twelfth filled their beds so full of pewter platters that they could not get into them. On the thirteenth night, the glass became unaccountably seized with a fit of cracking, and fell into shivers in all parts of the house. On the fourteenth, there was a noise as if forty pieces of artillery had been fired off, and a shower of pebble-stones, which so alarmed the commissioners that, “struck with great horror, they cried out to one another for help.”

They first of all tried the efficacy of prayers to drive away the evil spirits; but these proving unavailing, they began seriously to reflect whether it would not be much better to leave the place altogether to the devils that inhabited it. They ultimately resolved, however, to try it a little longer; and having craved forgiveness of all their sins, betook themselves to bed. That night they slept in tolerable comfort, but it was merely a trick of their tormentor to lull them into false security. When, on the succeeding night, they heard no noises, they began to flatter themselves that the devil was driven out, and prepared accordingly to take up their quarters for the whole winter in the palace. These symptoms on their part became the signal for renewed uproar among the fiends. On the 1st of November, they heard something walking with a slow and solemn pace up and down the withdrawing-room, and immediately afterwards a shower of stones, bricks, mortar, and broken glass pelted about their ears. On the 2d the steps were again heard in the withdrawing-room, sounding to their fancy very much like the treading of an enormous bear, which continued for about a quarter of an hour. This noise having ceased, a large warming-pan was thrown violently upon the table, followed by a number of stones and the jawbone of a horse. Some of the boldest walked valiantly into the withdrawing-room, armed with swords and pistols; but could discover nothing. They were afraid that night to go to sleep, and sat up, making fires in every room, and burning candles and lamps in great abundance; thinking that, as the fiends loved darkness, they would not disturb a company surrounded with so much light. They were deceived, however: buckets of water came down the chimneys and extinguished the fires; and the candles were blown out, they knew not how. Some of the servants who had betaken themselves to bed were drenched with putrid ditch-water as they lay, and arose in great fright, muttering incoherent prayers, and exposing to the wondering eyes of the commissioners their linen all dripping with green moisture, and their knuckles red with the blows they had at the same time received from some invisible tormentors. While they were still speaking, there was a

noise like the loudest thunder, or the firing of a whole park of artillery, upon which they all fell down upon their knees and implored the protection of the Almighty. One of the commissioners then arose, the others still kneeling, and asked in a courageous voice, and in the name of God, who was there, and what they had done that they should be troubled in that manner. No answer was returned, and the noises ceased for a while. At length, however, as the commissioners said, “the devil came again, and brought with it seven devils worse than itself.” Being again in darkness, they lighted a candle and placed it in the doorway, that it might throw a light upon the two chambers at once; but it was suddenly blown out, and one commissioner said that he had “seen the similitude of a horse’s hoof striking the candle and candlestick into the middle of the chamber, and afterwards making three scrapes on the snuff to put it out.” Upon this, the same person was so bold as to draw his sword; but he asserted positively that he had hardly withdrawn it from the scabbard before an invisible hand seized hold of it and tugged with him for it, and prevailing, struck him so violent a blow with the pommel that he was quite stunned. Then the noises began again; upon which, with one accord, they all retired into the presence-chamber, where they passed the night, praying and singing psalms.

They were by this time convinced that it was useless to struggle any longer with the powers of evil that seemed determined to make Woodstock their own. These things happened on the Saturday night; and being repeated on the Sunday, they determined to leave the place immediately, and return to London. By Tuesday morning early, all their preparations were completed; and, shaking the dust off their feet, and devoting Woodstock and all its inhabitants to the infernal gods, they finally took their departure.⁴³

Many years elapsed before the true cause of these disturbances was discovered. It was ascertained at the Restoration, that the whole was the work of Giles Sharp, the trusty clerk of the commissioners. This man,

whose real name was Joseph Collins, was a concealed royalist, and had passed his early life within the bowers of Woodstock; so that he knew every hole and corner of the place, and the numerous trap-doors and secret passages that abounded in the building. The commissioners, never suspecting the true state of his opinions, but believing him to be revolutionary to the back-bone, placed the utmost reliance upon him; a confidence which he abused in the manner above detailed, to his own great amusement and that of the few cavaliers whom he let into the secret.

Quite as extraordinary and as cleverly managed was the trick played off at Tedworth, in 1661, at the house of Mr. Mompesson, and which is so circumstantially narrated by the Rev. Joseph Glanvil, under the title of *The Demon of Tedworth*, and appended, among other proofs of witchcraft, to his noted work called *Sadducismus Triumphatus*. About the middle of April, in the year above mentioned, Mr. Mompesson, having returned to his house at Tedworth from a journey he had taken to London, was informed by his wife, that during his absence they had been troubled with the most extraordinary noises. Three nights afterwards he heard the noise himself; and it appeared to him to be that of “a great knocking at his doors, and on the outside of his walls.” He immediately arose, dressed himself, took down a pair of pistols, and walked valiantly forth to discover the disturber, under the impression that it must be a robber; but, as he went, the noise seemed to travel before or behind him; and when he arrived at the door from which he thought it proceeded, he saw nothing, but still heard “a strange hollow sound.” He puzzled his brains for a long time, and searched every corner of the house; but discovering nothing, he went to bed again. He was no sooner snug under the clothes than the noise began again more furiously than ever, sounding very much like a “thumping and drumming on the top of his house, and then by degrees going off into the air.”

These things continued for several nights, when it came to the recollection of Mr. Mompesson that some time before he had given orders

for the arrest and imprisonment of a wandering drummer, who went about the country with a large drum, disturbing quiet people and soliciting alms, and that he had detained the man's drum, and that probably the drummer was a wizard, and had sent evil spirits to haunt his house to be revenged of him. He became strengthened in his opinion every day, especially when the noises assumed, to his fancy, a resemblance to the beating of a drum, "like that at the breaking up of a guard." Mrs. Mompesson being brought to bed, the devil, or the drummer, very kindly and considerately refrained from making the usual riot; but, as soon as she recovered strength, began again "in a ruder manner than before, following and vexing the young children, and beating their bedsteads with so much violence that every one expected they would fall in pieces." For an hour together, as the worthy Mr. Mompesson repeated to his wondering neighbours, this infernal drummer "would beat 'Roundheads and Cuckolds,' the 'Tat-too,' and several other points of war, as cleverly as any soldier." When this had lasted long enough, he changed his tactics, and scratched with his iron talons under the children's bed. "On the 5th of November," says the Rev. Joseph Glanvil, "it made a mighty noise; and a servant observing two boards in the children's room seeming to move, he bid it give him one of them. Upon which the board came (nothing moving it that he saw) within a yard of him. The man added, 'Nay, let me have it in my hand;' upon which the spirit, devil, or drummer pushed it towards him so close that he might touch it." "This," continues Glanvil, "was in the day-time, and was seen by a whole room full of people. That morning it left a sulphureous smell behind it, which was very offensive. At night the minister, one Mr. Cragg, and several of the neighbours came to the house on a visit. Mr. Cragg went to prayers with them, kneeling at the children's bedside, where it then became very troublesome and loud. During prayer-time, the spirit withdrew into the cock-loft, but returned as soon as prayers were done; and then, in sight of the company, the chairs walked about the room of themselves, the children's shoes were hurled over their heads, and every loose thing moved

about the chamber. At the same time, a bed-staff was thrown at the minister, which hit him on the leg, but so favourably, that a lock of wool could not have fallen more softly.” On another occasion, the blacksmith of the village, a fellow who cared neither for ghost nor devil, slept with John the footman, that he also might hear the disturbances and be cured of his incredulity, when there “came a noise in the room as if one had been shoeing a horse, and somewhat came, as it were, with a pair of pincers,” snipping and snapping at the poor blacksmith’s nose the greater part of the night. Next day it came panting like a dog out of breath; upon which some woman present took a bed-staff to knock at it, “which was caught suddenly out of her hand and thrown away; and company coming up, the room was presently filled with a *bloomy noisome smell*, and was very hot, though without fire, in a very sharp and severe winter. It continued in the bed, panting and scratching for an hour and a half, and then went into the next room, where it knocked a little, and seemed to rattle a chain.”

The rumour of these wonderful occurrences soon spread all over the country, and people from far and near flocked to the haunted house of Tedworth, to believe or doubt as their natures led them, but all filled with intense curiosity. It appears, too, that the fame of these events reached the royal ear, and that some gentlemen were sent by the king to investigate the circumstances, and draw up a report of what they saw or heard. Whether the royal commissioners were more sensible men than the neighbours of Mr. Mompesson, and required more clear and positive evidence than they, or whether the powers with which they were armed to punish any body who might be found carrying on this deception frightened the evil-doers, is not certain; but Glanvil himself reluctantly confesses that all the time they were in the house the noises ceased, and nothing was heard or seen. “However,” says he, “as to the quiet of the house when the courtiers were there, the intermission may have been accidental, or perhaps the demon was not willing to give so public a testimony of those transactions which

might possibly convince those who he had rather should continue in unbelief of his existence.”

As soon as the royal commissioners took their departure, the infernal drummer recommenced his antics, and hundreds of persons were daily present to hear and wonder. Mr. Mompesson’s servant was so fortunate as not only to hear, but to see this pertinacious demon, for it came and stood at the foot of his bed. “The exact shape and proportion of it he could not discover; but he saw a great body, with two red and glaring eyes, which, for some time, were fixed steadily on him, and at length disappeared.” Innumerable were the antics it played. Once it purred like a cat; beat the children’s legs black and blue; put a long spike into Mr. Mompesson’s bed, and a knife into his mother’s; filled the porringers with ashes; hid a Bible under the grate; and turned the money black in people’s pockets. “One night,” said Mr. Mompesson, in a letter to Mr. Glanvil, “there were seven or eight of these devils in the shape of men, who, as soon as a gun was fired, would shuffle away into an arbour;” a circumstance which might have convinced Mr. Mompesson of the mortal nature of his persecutors, if he had not been of the number of those worse than blind, who shut their eyes and refuse to see.

In the mean time the drummer, the supposed cause of all the mischief, passed his time in Gloucester gaol, whither he had been committed as a rogue and a vagabond. Being visited one day by some person from the neighbourhood of Tedworth, he asked what was the news in Wiltshire, and whether people did not talk a great deal about a drumming in a gentleman’s house there? The visitor replied that he heard of nothing else; upon which the drummer observed, “I have done it; I have thus plagued him; and he shall never be quiet until he hath made me satisfaction for taking away my drum.” No doubt the fellow, who seems to have been a gipsy, spoke the truth, and that the gang of which he was a member knew more about the noises at Mr. Mompesson’s house than any body else. Upon these words, however, he was brought to trial at Salisbury for witchcraft;

and, being found guilty, was sentenced to transportation; a sentence which, for its leniency, excited no little wonder in that age, when such an accusation, whether proved or not, generally insured the stake or the gibbet. Glanvil says that the noises ceased immediately the drummer was sent beyond the seas; but that, somehow or other, he managed to return from transportation; “by raising storms and affrighting the seamen, it was said;” when the disturbances were forthwith renewed, and continued at intervals for several years. Certainly, if the confederates of this roving gipsy were so pertinacious in tormenting poor weak Mr. Mompesson, their pertinacity is a most extraordinary instance of what revenge is capable of. It was believed by many, at the time, that Mr. Mompesson himself was privy to the whole matter, and permitted and encouraged these tricks in his house for the sake of notoriety; but it seems more probable that the gipsies were the real delinquents, and that Mr. Mompesson was as much alarmed and bewildered as his credulous neighbours, whose excited imaginations conjured up no small portion of these stories,

“Which rolled, and as they rolled grew larger visibly.”

Many instances of a similar kind, during the seventeenth century, might be gleaned from Glanvil and other writers of that period; but they do not differ sufficiently from these to justify a detail of them. The most famous of all haunted houses acquired its notoriety much nearer our own time; and the circumstances connected with it are so curious, and afford so fair a specimen of the easy credulity even of well-informed and sensible people, as to merit a little notice in this chapter. The Cock-Lane Ghost, as it was called, kept London in commotion for a considerable time, and was the theme of conversation among the learned and the illiterate, and in every circle, from that of the prince to that of the peasant.



THE HAUNTED HOUSE IN COCK LANE.

At the commencement of the year 1760, there resided in Cock Lane, near West Smithfield, in the house of one Parsons, the parish clerk of St. Sepulchre's, a stockbroker, named Kent. The wife of this gentleman had died in child-bed during the previous year, and his sister-in-law, Miss Fanny, had arrived from Norfolk to keep his house for him. They soon conceived a mutual affection, and each of them made a will in the other's favour. They lived some months in the house of Parsons, who, being a needy man, borrowed money of his lodger. Some difference arose betwixt them, and Mr. Kent left the house, and instituted legal proceedings against the parish-clerk for the recovery of his money.

While this matter was yet pending, Miss Fanny was suddenly taken ill of the small-pox; and, notwithstanding every care and attention, she died in a few days, and was buried in a vault under Clerkenwell church. Parsons now began to hint that the poor lady had come unfairly by her death, and that Mr. Kent was accessory to it, from his too great eagerness to enter into possession of the property she had bequeathed him. Nothing further was said for nearly two years; but it would appear that Parsons was of so revengeful a character, that he had never forgotten or forgiven his differences with Mr. Kent, and the indignity of having been sued for the borrowed money. The strong passions of pride and avarice were silently at work during all that interval, hatching schemes of revenge, but dismissing

them one after the other as impracticable, until, at last, a notable one suggested itself. About the beginning of the year 1762, the alarm was spread over all the neighbourhood of Cock Lane, that the house of Parsons was haunted by the ghost of poor Fanny, and that the daughter of Parsons, a girl about twelve years of age, had several times seen and conversed with the spirit, who had, moreover, informed her, that she had not died of the small-pox, as was currently reported, but of poison, administered by Mr. Kent. Parsons, who originated, took good care to countenance these reports; and, in answer to numerous inquiries, said his house was every night, and had been for two years, in fact, ever since the death of Fanny, troubled by a loud knocking at the doors and in the walls. Having thus prepared the ignorant and credulous neighbours to believe or exaggerate for themselves what he had told them, he sent for a gentleman of a higher class in life, to come and witness these extraordinary occurrences. The gentleman came accordingly, and found the daughter of Parsons, to whom the spirit alone appeared, and whom alone it answered, in bed, trembling violently, having just seen the ghost, and been again informed that she had died from poison. A loud knocking was also heard from every part of the chamber, which so mystified the not very clear understanding of the visitor, that he departed, afraid to doubt and ashamed to believe, but with a promise to bring the clergyman of the parish and several other gentlemen on the following day, to report upon the mystery.

On the following night he returned, bringing with him three clergymen, and about twenty other persons, including two negroes, when, upon a consultation with Parsons, they resolved to sit up the whole night, and await the ghost's arrival. It was then explained by Parsons, that although the ghost would never render itself visible to any body but his daughter, it had no objection to answer the questions that might be put to it, by any person present, and that it expressed an affirmation by one knock, a negative by two, and its displeasure by a kind of scratching. The child was then put into bed along with her sister, and the clergymen examined the

bed and bed-clothes to satisfy themselves that no trick was played, by knocking upon any substance concealed among the clothes. As on the previous night, the bed was observed to shake violently.



ROOM IN THE HAUNTED HOUSE IN COCK LANE.⁴⁴

After some hours, during which they all waited with exemplary patience, the mysterious knocking was heard in the wall, and the child declared that she saw the ghost of poor Fanny. The following questions were then gravely put by the clergyman, through the medium of one Mary Frazer, the servant of Parsons, and to whom it was said the deceased lady had been much attached. The answers were in the usual fashion, by a knock or knocks:

“Do you make this disturbance on account of the ill-usage you received from Mr. Kent?”—“Yes.”

“Were you brought to an untimely end by poison?”—“Yes.”

“How was the poison administered, in beer or purl?”—“In purl.”

“How long was that before your death?”—“About three hours.”

“Can your former servant, Carrots, give any information about the poison?”—“Yes.”

“Are you Kent’s wife’s sister?”—“Yes.”

“Were you married to Kent after your sister’s death?”—“No.”

“Was any body else, besides Kent, concerned in your murder?”—“No.”

“Can you, if you like, appear visibly to any one?”—“Yes.”

“Will you do so?”—“Yes.”

“Can you go out of this house?”—“Yes.”

“Is it your intention to follow this child about every where?”—“Yes.”

“Are you pleased in being asked these questions?”—“Yes.”

“Does it ease your troubled soul?”—“Yes.”

[Here there was heard a mysterious noise, which some wiseacre present compared to the fluttering of wings.]

“How long before your death did you tell your servant, Carrots, that you were poisoned? An hour?”—“Yes.”

[Carrots, who was present, was appealed to; but she stated positively that such was not the fact, as the deceased was quite speechless an hour before her death. This shook the faith of some of the spectators, but the examination was allowed to continue.]

“How long did Carrots live with you?”—“Three or four days.”

[Carrots was again appealed to, and said that this was true.]

“If Mr. Kent is arrested for this murder, will he confess?”—“Yes.”

“Would your soul be at rest if he were hanged for it?”—“Yes.”

“Will he be hanged for it?”—“Yes.”

“How long a time first?”—“Three years.”

“How many clergymen are there in this room?”—“Three.”

“How many negroes?”—“Two.”

“Is this watch (held up by one of the clergymen) white?”—“No.”

“Is it yellow?”—“No.”

“Is it blue?”—“No.”

“Is it black?”—“Yes.”

[The watch was in a black shagreen case.]

“At what time this morning will you take your departure?”

The answer to this question was four knocks, very distinctly heard by every person present; and accordingly, at four o'clock precisely the ghost took its departure to the Wheatsheaf public-house close by, where it frightened mine host and his lady almost out of their wits, by knocking in the ceiling right above their bed.

The rumour of these occurrences very soon spread over London, and every day Cock Lane was rendered impassable by the crowds of people who assembled around the house of the parish clerk, in expectation of either seeing the ghost or of hearing the mysterious knocks. It was at last found necessary, so clamorous were they for admission within the haunted precincts, to admit those only who would pay a certain fee, an arrangement which was very convenient to the needy and money-loving Mr. Parsons. Indeed, things had taken a turn greatly to his satisfaction; he not only had his revenge, but he made a profit out of it. The ghost, in consequence, played its antics every night, to the great amusement of many hundreds of people and the great perplexity of a still greater number.

Unhappily, however, for the parish clerk, the ghost was induced to make some promises which were the means of utterly destroying its reputation. It promised, in answer to the questions of the Rev. Mr. Aldritch of Clerkenwell, that it would not only follow the little Miss Parsons wherever she went, but would also attend him, or any other gentleman, into the vault under St. John's Church, where the body of the murdered woman was deposited, and would there give notice of its presence by a distinct knock upon the coffin. As a preliminary, the girl was conveyed to the house of Mr. Aldritch near the church, where a large party of ladies and gentlemen, eminent for their acquirements, their rank, or their wealth, had assembled. About ten o'clock on the night of the first of February, the girl having been brought from Cock Lane in a coach, was put to bed by several ladies in the house of Mr. Aldritch; a strict examination having been previously made that nothing was hidden in the bed-clothes. While the gentlemen in an adjoining chamber were deliberating whether they should proceed in a body to the vault, they were summoned into the bedroom by the ladies, who affirmed, in great alarm, that the ghost was come, and that they heard the knocks and scratches. The gentlemen entered accordingly, with a determination to suffer no deception. The little girl, on being asked whether she saw the ghost, replied, "No; but she felt it on her back like a

mouse.” She was then required to put her hands out of bed, and they being held by some of the ladies, the spirit was summoned in the usual manner to answer, if it were in the room. The question was several times put with great solemnity; but the customary knock was not heard in reply in the walls, neither was there any scratching. The ghost was then asked to render itself visible, but it did not choose to grant the request. It was next solicited to give some token of its presence by a sound of any sort, or by touching the hand or cheek of any lady or gentleman in the room; but even with this request the ghost would not comply.

There was now a considerable pause, and one of the clergymen went down stairs to interrogate the father of the girl, who was waiting the result of the experiment. He positively denied that there was any deception, and even went so far as to say that he himself, upon one occasion, had seen and conversed with the awful ghost. This having been communicated to the company, it was unanimously resolved to give the ghost another trial; and the clergyman called out in a loud voice to the supposed spirit, that the gentleman to whom it had promised to appear in the vault was about to repair to that place, where he claimed the fulfilment of its promise. At one hour after midnight they all proceeded to the church, and the gentleman in question, with another, entered the vault alone, and took up their position alongside of the coffin of poor Fanny. The ghost was then summoned to appear, but it appeared not; it was summoned to knock, but it knocked not; it was summoned to scratch, but it scratched not; and the two retired from the vault, with a firm belief that the whole business was a deception practised by Parsons and his daughter. There were others, however, who did not wish to jump so hastily to a conclusion, and who suggested that they were perhaps trifling with this awful and supernatural being, which, being offended with them for their presumption, would not condescend to answer them. Again, after serious consultation, it was agreed on all hands that if the ghost answered any body at all, it would answer Mr. Kent, the supposed murderer; and he was accordingly requested to go down into the

vault. He went with several others, and summoned the ghost to answer whether he had indeed poisoned her. There being no answer, the question was put by Mr. Aldritch, who conjured it, if it were indeed a spirit, to end their doubts, make a sign of its presence, and point out the guilty person. There being still no answer for the space of half an hour, during which time all these boobies waited with the most praiseworthy perseverance, they returned to the house of Mr. Aldritch, and ordered the girl to get up and dress herself. She was strictly examined, but persisted in her statement that she used no deception, and that the ghost had really appeared to her.

So many persons had, by their openly expressed belief of the reality of the visitation, identified themselves with it, that Parsons and his family were far from being the only persons interested in the continuance of the delusion. The result of the experiment convinced most people; but these were not to be convinced by any evidence, however positive, and they therefore spread abroad the rumour, that the ghost had not appeared in the vault because Mr. Kent had taken care beforehand to have the coffin removed. That gentleman, whose position was a very painful one, immediately procured competent witnesses, in whose presence the vault was entered, and the coffin of poor Fanny opened. Their depositions were then published; and Mr. Kent indicted Parsons and his wife, his daughter, Mary Frazer the servant, the Rev. Mr. Moor, and a tradesman, two of the most prominent patrons of the deception, for a conspiracy. The trial came on in the Court of King's Bench, on the 10th of July, before Lord Chief-Justice Mansfield, when, after an investigation which lasted twelve hours, the whole of the conspirators were found guilty. The Rev. Mr. Moor and his friend were severely reprimanded in open court, and recommended to make some pecuniary compensation to the prosecutor for the aspersions they had been instrumental in throwing upon his character. Parsons was sentenced to stand three times in the pillory, and to be imprisoned for two years; his wife to one year's, and his servant to six months' imprisonment in the Bridewell. A printer, who had been employed by them to publish an

account of the proceedings for their profit, was also fined fifty pounds, and discharged.

The precise manner in which the deception was carried on has never been explained. The knocking in the wall appears to have been the work of Parsons' wife, while the scratching part of the business was left to the little girl. That any contrivance so clumsy could have deceived any body cannot fail to excite our wonder. But thus it always is. If two or three persons can only be found to take the lead in any absurdity, however great, there is sure to be plenty of imitators. Like sheep in a field, if one clears the stile, the rest will follow.

About ten years afterwards, London was again alarmed by the story of a haunted house. Stockwell, near Vauxhall, the scene of the antics of this new ghost, became almost as celebrated in the annals of superstition as Cock Lane. Mrs. Golding, an elderly lady, who resided alone with her servant, Anne Robinson, was sorely surprised on the evening of Twelfth-Day, 1772, to observe a most extraordinary commotion among her crockery. Cups and saucers rattled down the chimney—pots and pans were whirled down stairs, or through the windows; and hams, cheeses, and loaves of bread disported themselves upon the floor as if the devil were in them. This, at least, was the conclusion that Mrs. Golding came to; and being greatly alarmed, she invited some of her neighbours to stay with her, and protect her from the evil one. Their presence, however, did not put a stop to the insurrection of china, and every room in the house was in a short time strewn with the fragments. The chairs and tables joined, at last, in the tumult, and things looked altogether so serious and inexplicable, that the neighbours, dreading that the house itself would next be seized with a fit of motion, and tumble about their ears, left poor Mrs. Golding to bear the brunt of it by herself. The ghost in this case was solemnly remonstrated with, and urged to take its departure; but the demolition continuing as great as before, Mrs. Golding finally made up her mind to quit the house altogether. She took refuge with Anne Robinson in the house of a

neighbour; but his glass and crockery being immediately subjected to the same persecution, he was reluctantly compelled to give her notice to quit. The old lady thus forced back to her own house, endured the disturbance for some days longer, when suspecting that Anne Robinson was the cause of all the mischief, she dismissed her from her service. The extraordinary appearances immediately ceased, and were never afterwards renewed; a fact which is of itself sufficient to point out the real disturber. A long time afterwards, Anne Robinson confessed the whole matter to the Reverend Mr. Brayfield. This gentleman confided the story to Mr. Hone, who has published an explanation of the mystery. Anne, it appears, was anxious to have a clear house, to carry on an intrigue with her lover, and resorted to this trick to effect her purpose. She placed the china on the shelves in such a manner that it fell on the slightest motion, and attached horse-hairs to other articles, so that she could jerk them down from an adjoining room without being perceived by any one. She was exceedingly dexterous at this sort of work, and would have proved a formidable rival to many a juggler by profession. A full explanation of the whole affair may be found in the *Every-day Book*.

The latest instance of the popular panic occasioned by a house supposed to be haunted, occurred in Scotland, in the winter of the year 1838. On the 5th of December, the inmates of the farm-house of Baldarroch, in the district of Banchory, Aberdeenshire, were alarmed by observing a great number of sticks, pebble-stones, and clods of earth flying about their yard and premises. They endeavoured, but in vain, to discover who was the delinquent; and the shower of stones continuing for five days in succession, they came at last to the conclusion that the devil and his imps were alone the cause of it. The rumour soon spread over all that part of the country, and hundreds of persons came from far and near to witness the antics of the devils of Baldarroch. After the fifth day, the shower of clods and stones ceased on the outside of the premises, and the scene shifted to the interior. Spoons, knives, plates, mustard-pots, rolling-pins, and flat-irons appeared

suddenly endued with the power of self-motion, and were whirled from room to room, and rattled down the chimneys in a manner which nobody could account for. The lid of a mustard-pot was put into a cupboard by the servant-girl in the presence of scores of people, and in a few minutes afterwards came bouncing down the chimney, to the consternation of every body. There was also a tremendous knocking at the doors and on the roof, and pieces of stick and pebble-stones rattled against the windows and broke them. The whole neighbourhood was a scene of alarm; and not only the vulgar, but persons of education, respectable farmers, within a circle of twenty miles, expressed their belief in the supernatural character of these events, and offered up devout prayers to be preserved from the machinations of the Evil One. The note of fear being once sounded, the visitors, as is generally the case in all tales of wonder, strove with each other who should witness the most extraordinary occurrences; and within a week, it was generally believed in the parishes of Banchory-Ternan, Drumoak, Durriss, Kincardine-O'Neil, and all the circumjacent districts of Mearns and Aberdeenshire, that the devil had been seen in the act of hammering upon the house-top of Baldarroch. One old man asserted positively that, one night, after having been to see the strange gambols of the knives and mustard-pots, he met the phantom of a great black man, "who wheeled round his head with a whizzing noise, making a wind about his ears that almost blew his bonnet off," and that he was haunted by him in this manner for three miles. It was also affirmed and believed, that all horses and dogs that approached this enchanted ground were immediately affected; that a gentleman, slow of faith, had been cured of his incredulity by meeting the butter-churn jumping in at the door as he himself was going out; that the roofs of houses had been torn off, and that several ricks in the corn-yard had danced a quadrille together, to the sound of the devil's bagpipes re-echoing from the mountain-tops. The women in the family of the persecuted farmer of Baldarroch also kept their tongues in perpetual motion; swelling with their strange stories the tide of popular wonder. The

goodwife herself, and all her servants, said that, whenever they went to bed, they were attacked with stones and other missiles, some of which came below the blankets and gently tapped their toes. One evening, a shoe suddenly darted across a garret where some labourers were sitting, and one of the men, who attempted to catch it, swore positively that it was so hot and heavy he was unable to hold it. It was also said that the bearbeater (a sort of mortar used to bruise barley in)—an object of such weight that it requires several men to move it—spontaneously left the barn and flew over the house-top, alighting at the feet of one of the servant-maids, and hitting her, but without hurting her in the least, or even causing her any alarm; it being a fact well known to her, that all objects thus thrown about by the devil lost their specific gravity, and could harm nobody, even though they fell upon a person's head.

Among the persons drawn to Baldarroch by these occurrences were the heritor, the minister, and all the elders of the Kirk, under whose superintendence an investigation was immediately commenced. Their proceedings were not promulgated for some days; and, in the mean time, rumour continued to travel through all the Highlands, magnifying each mysterious incident the farther it got from home. It was said, that when the goodwife put her potato-pot on the fire, each potato, as the water boiled, changed into a demon, and grinned horribly at her as she lifted the lid; that not only chairs and tables, but carrots and turnips, skipped along the floor in the merriest manner imaginable; that shoes and boots went through all the evolutions of the Highland fling without any visible wearers directing their motions; and that a piece of meat detached itself from the hook on which it hung in the pantry, and placed itself before the fire, whence all the efforts of the people of the house were unable to remove it until it was thoroughly roasted; and that it then flew up the chimney with a tremendous bang. At Baldarroch itself the belief was not quite so extravagant; but the farmer was so convinced that the devil and his imps were alone the cause of all the disturbance, that he travelled a distance of

forty miles to an old conjuror, named Willie Foreman, to induce him, for a handsome fee, to remove the enchantment from his property. There were, of course, some sensible and educated people, who, after stripping the stories circulated of their exaggeration, attributed all the rest to one or other of two causes; first, that some gipsies, or strolling mendicants, hidden in the neighbouring plantation, were amusing themselves by working on the credulity of the country people; or, secondly, that the inmates of Baldarroch carried on this deception themselves, for some reason or other, which was not very clear to any body. The last opinion gained but few believers, as the farmer and his family were much respected; and so many persons had, in the most open manner, expressed their belief in the supernatural agency, that they did not like to stultify themselves by confessing that they had been deceived.

At last, after a fortnight's continuance of the noises, the whole trick was discovered. The two servant lasses were strictly examined, and then committed to prison. It appeared that they were alone at the bottom of the whole affair, and that the extraordinary alarm and credulity of their master and mistress, in the first instance, and of the neighbours and country people afterwards, made their task comparatively easy. A little common dexterity was all they had used; and, being themselves unsuspected, they swelled the alarm by the wonderful stories they invented. It was they who loosened the bricks in the chimneys, and placed the dishes in such a manner on the shelves, that they fell on the slightest motion. In short, they played the same tricks as those used by the servant girl at Stockwell, with the same results, and for the same purpose—the gratification of a love of mischief. They were no sooner secured in the county gaol than the noises ceased, and most people were convinced that human agency alone had worked all the wonder. Some few of the most devoutly superstitious still held out in their first belief, and refused to listen to any explanation.

These tales of haunted houses, especially those of the last and present century, however they may make us blush for popular folly, are yet

gratifying in their results; for they shew that society has made a vast improvement. Had Parsons and his wife, and the other contrivers of the Cock Lane deception, lived two hundred years earlier, they would not perhaps have found a greater number of dupes, but they would have been hanged as witches, instead of being imprisoned as vagabonds. The ingenious Anne Robinson and the sly lasses of Baldarroch would doubtless have met a similar fate. Thus it is pleasant to reflect, that though there may be as much folly and credulity in the world as ever in one class of society, there is more wisdom and mercy in another than ever were known before. Lawgivers, by blotting from the statute-book the absurd or sanguinary enactments of their predecessors, have made one step towards teaching the people. It is to be hoped that the day is not far distant when lawgivers will teach the people by some more direct means, and prevent the recurrence of delusions like these, and many worse, which might be cited, by securing to every child born within their dominions an education in accordance with the advancing state of civilisation. If ghosts and witches are not yet altogether exploded, it is the fault, not so much of the ignorant people, as of the law and the government that have neglected to enlighten them.

POPULAR FOLLIES OF GREAT CITIES.

La faridondaine—la faridondon,
Vive la faridondaine!—*Beranger.*



THE popular humours of a great city are a never-failing source of amusement to the man whose sympathies are hospitable enough to embrace all his kind, and who, refined though he may be himself, will not sneer at the humble wit or grotesque peculiarities of the boozing mechanic, the squalid beggar, the vicious urchin, and all the motley group of the idle, the reckless, and the imitative that swarm in the alleys and broadways of a metropolis. He who walks through a great city to find subjects for weeping, may find plenty at every corner to wring his heart; but let such a man walk on his course, and enjoy his grief alone—we are not of those who would accompany him. The miseries of us poor earth-dwellers gain no alleviation from the sympathy of those who merely hunt them out to be pathetic over them. The weeping philosopher too often impairs his eyesight by his woe, and becomes unable from his tears to see the remedies for the evils which he deploras. Thus it will often be found

that the man of no tears is the truest philanthropist, as he is the best physician who wears a cheerful face, even in the worst of cases.

So many pens have been employed to point out the miseries, and so many to condemn the crimes and vices, and more serious follies of the multitude, that ours shall not increase the number, at least in this chapter. Our present task shall be less ungracious, and wandering through the busy haunts of great cities, we shall seek only for amusement, and note as we pass a few of the harmless follies and whimsies of the poor.

And, first of all, walk where we will, we cannot help hearing from every side a phrase repeated with delight, and received with laughter, by men with hard hands and dirty faces, by saucy butcher lads and errand-boys, by loose women, by hackney coachmen, cabriolet-drivers, and idle fellows who loiter at the corners of streets. Not one utters this phrase without producing a laugh from all within hearing. It seems applicable to every circumstance, and is the universal answer to every question; in short, it is the favourite slang phrase of the day, a phrase that, while its brief season of popularity lasts, throws a dash of fun and frolicsomeness over the existence of squalid poverty and ill-requited labour, and gives them reason to laugh as well as their more fortunate fellows in a higher stage of society.

London is peculiarly fertile in this sort of phrases, which spring up suddenly, no one knows exactly in what spot, and pervade the whole population in a few hours, no one knows how. Many years ago the favourite phrase (for, though but a monosyllable, it was a phrase in itself) was Quoz. This odd word took the fancy of the multitude in an extraordinary degree, and very soon acquired an almost boundless meaning. When vulgar wit wished to mark its incredulity, and raise a

laugh at the same time, there was no resource so sure as this popular piece of slang. When a man was asked a favour which he did not choose to grant, he marked his sense of the suitor's unparalleled presumption by exclaiming *Quoz!* When a mischievous urchin wished to annoy a passenger, and create mirth for his comrades, he looked him in the face, and cried out *Quoz!* and the exclamation never failed in its object. When a disputant was desirous of throwing a doubt upon the veracity of his opponent, and getting summarily rid of an argument which he could not overturn, he uttered the word *Quoz*, with a contemptuous curl of his lip, and an impatient shrug of his shoulders. The universal monosyllable conveyed all his meaning, and not only told his opponent that he lied, but that he erred egregiously if he thought that any one was such a nincompoop as to believe him. Every alehouse resounded with *Quoz*; every street-corner was noisy with it, and every wall for miles around was chalked with it.

But, like all other earthly things, *Quoz* had its season, and passed away as suddenly as it arose, never again to be the pet and the idol of the populace. A new claimant drove it from its place, and held undisputed sway till, in its turn, it was hurled from its pre-eminence, and a successor appointed in its stead.

“*What a shocking bad hat!*” was the phrase that was next in vogue. No sooner had it become universal, than thousands of idle but sharp eyes were on the watch for the passenger whose hat shewed any signs, however slight, of ancient service. Immediately the cry arose, and, like the war-whoop of the Indians, was repeated by a hundred discordant throats. He was a wise man who, finding himself under these circumstances “the observed of all observers,” bore his honours

meekly. He who shewed symptoms of ill-feeling at the imputations cast upon his hat, only brought upon himself redoubled notice. The mob soon perceive whether a man is irritable, and, if of their own class, they love to make sport of him. When such a man, and with such a hat, passed in those days through a crowded neighbourhood, he might think himself fortunate if his annoyances were confined to the shouts and cries of the populace. The obnoxious hat was often snatched from his head and thrown into the gutter by some practical joker, and then raised, covered with mud, upon the end of a stick, for the admiration of the spectators, who held their sides with laughter, and exclaimed, in the pauses of their mirth, "*Oh, what a shocking bad hat!*" "*What a shocking bad hat!*" Many a nervous poor man, whose purse could but ill spare the outlay, doubtless purchased a new hat before the time, in order to avoid exposure in this manner.

The origin of this singular saying, which made fun for the metropolis for months, is not involved in the same obscurity as that which shrouds the origin of *Quoz* and some others. There had been a hotly contested election for the borough of Southwark, and one of the candidates was an eminent hatter. This gentleman, in canvassing the electors, adopted a somewhat professional mode of conciliating their good-will, and of bribing them without letting them perceive that they were bribed. Whenever he called upon or met a voter whose hat was not of the best material, or, being so, had seen its best days, he invariably said, "*What a shocking bad hat you have got; call at my warehouse, and you shall have a new one!*" Upon the day of election this circumstance was remembered, and his opponents made the most of it, by inciting the crowd to keep up an incessant cry of "*What a shocking bad hat!*" all the time the honourable candidate was

addressing them. From Southwark the phrase spread over all London, and reigned for a time the supreme slang of the season.

Hookey Walker, derived from the chorus of a popular ballad, was also high in favour at one time, and served, like its predecessor *Quoz*, to answer all questions. In the course of time, the latter word alone became the favourite, and was uttered with a peculiar drawl upon the first syllable, and a sharp turn upon the last. If a lively servant girl was importuned for a kiss by a fellow she did not care about, she cocked her little nose, and cried "*Walker!*" If a dustman asked his friend for the loan of a shilling, and his friend was either unable or unwilling to accommodate him, the probable answer he would receive was, "*Walker!*" If a drunken man was reeling about the streets, and a boy pulled his coat-tails, or a man knocked his hat over his eyes to make fun of him, the joke was always accompanied by the same exclamation. This lasted for two or three months, and "*Walker!*" walked off the stage, never more to be revived for the entertainment of that or any future generation.

The next phrase was a most preposterous one. Who invented it, how it arose, or where it was first heard, are alike unknown. Nothing about it is certain, but that for months it was *the slang par excellence* of the Londoners, and afforded them a vast gratification. "*There he goes with his eye out!*" or "*There she goes with her eye out!*" as the sex of the party alluded to might be, was in the mouth of every body who knew the town. The sober part of the community were as much puzzled by this unaccountable saying as the vulgar were delighted with it. The wise thought it very foolish, but the many thought it very funny, and the idle amused themselves by chalking it upon walls, or scribbling it upon monuments. But "all that's bright must fade," even

in slang. The people grew tired of their hobby, and "*There he goes with his eye out!*" was heard no more in its accustomed haunts.

Another very odd phrase came into repute in a brief space afterwards, in the form of the impertinent and not universally apposite query, "*Has your mother sold her mangle?*" But its popularity was not of that boisterous and cordial kind which ensures a long continuance of favour. What tended to impede its progress was, that it could not be well applied to the older portions of society. It consequently ran but a brief career, and then sank into oblivion. Its successor enjoyed a more extended fame, and laid its foundations so deep, that years and changing fashions have not sufficed to eradicate it. This phrase was "*Flare up!*" and it is, even now, a colloquialism in common use. It took its rise in the time of the Reform riots, when Bristol was nearly half burned by the infuriated populace. The flames were said to have *flared up* in the devoted city. Whether there was any thing peculiarly captivating in the sound, or in the idea of these words, is hard to say; but whatever was the reason, it tickled the mob-fancy mightily, and drove all other slang out of the field before it. Nothing was to be heard all over London but "*flare up!*" It answered all questions, settled all disputes, was applied to all persons, all things, and all circumstances, and became suddenly the most comprehensive phrase in the English language. The man who had overstepped the bounds of decorum in his speech was said to have *flared up*; he who had paid visits too repeated to the gin-shop, and got damaged in consequence, had *flared up*. To put one's self into a passion; to stroll out on a nocturnal frolic, and alarm a neighbourhood, or to create a disturbance in any shape, was to *flare up*. A lovers' quarrel was a *flare up*; so was a boxing-match

between two blackguards in the streets; and the preachers of sedition and revolution recommended the English nation to *flare up*, like the French. So great a favourite was the word, that people loved to repeat it for its very sound. They delighted apparently in hearing their own organs articulate it; and labouring men, when none who could respond to the call were within hearing, would often startle the aristocratic echoes of the West by the well-known slang phrase of the East. Even in the dead hours of the night, the ears of those who watched late, or who could not sleep, were saluted with the same sound. The drunkard reeling home shewed that he was still a man and a citizen, by calling "*flare up!*" in the pauses of his hiccough. Drink had deprived him of the power of arranging all other ideas; his intellect was sunk to the level of the brute's; but he clung to humanity by the one last link of the popular cry. While he could vociferate that sound, he had rights as an Englishman, and would not sleep in a gutter, like a dog! Onwards he went, disturbing quiet streets and comfortable people by his whoop, till exhausted nature could support him no more, and he rolled powerless into the road. When, in due time afterwards, the policeman stumbled upon him as he lay, that guardian of the peace turned the full light of his lantern on his face, and exclaimed, "Here's a poor devil who has been *flaring up!*" Then came the stretcher, on which the victim of deep potations was carried to the watch-house, and pitched into a dirty cell, among a score of wretches about as far gone as himself, who saluted their new comrade by a loud, long shout of *flare up!*

So universal was this phrase, and so enduring seemed its popularity, that a speculator, who knew not the evanescence of slang, established a weekly newspaper under its name. But he was like the

man who built his house upon the sand; his foundation gave way under him, and the phrase and the newspaper were washed into the mighty sea of the things that were. The people grew at last weary of the monotony, and "*flare up*" became vulgar even among them. Gradually it was left to little boys who did not know the world, and in process of time sank altogether into neglect. It is now heard no more as a piece of popular slang; but the words are still used to signify any sudden outburst either of fire, disturbance, or ill-nature.

The next phrase that enjoyed the favour of the million was less concise, and seems to have been originally aimed against precocious youths who gave themselves the airs of manhood before their time. "*Does your mother know you're out?*" was the provoking query addressed to young men of more than reasonable swagger, who smoked cigars in the streets, and wore false whiskers to look irresistible. We have seen many a conceited fellow who could not suffer a woman to pass him without staring her out of countenance, reduced at once into his natural insignificance by the mere utterance of this phrase. Apprentice lads and shopmen in their Sunday clothes held the words in abhorrence, and looked fierce when they were applied to them. Altogether the phrase had a very salutary effect, and in a thousand instances shewed young Vanity that it was not half so pretty and engaging as it thought itself. What rendered it so provoking was the doubt it implied as to the capability of self-guidance possessed by the individual to whom it was addressed. "*Does your mother know you're out?*" was a query of mock concern and solicitude, implying regret and concern that one so young and inexperienced in the ways of a great city should be allowed to wander abroad without the guidance of a parent. Hence the great wrath of

those who verged on manhood, but had not reached it, whenever they were made the subject of it. Even older heads did not like it; and the heir of a ducal house, and inheritor of a warrior's name, to whom they were applied by a cabriolet-driver who was ignorant of his rank, was so indignant at the affront, that he summoned the offender before the magisterial bench. The fellow had wished to impose upon his lordship by asking double the fare he was entitled to; and when his lordship resisted the demand, he was insultingly asked "if his mother knew he was out?" All the drivers on the stand joined in the query, and his lordship was fain to escape their laughter by walking away with as much haste as his dignity would allow. The man pleaded ignorance that his customer was a lord, but offended justice fined him for his mistake.

When this phrase had numbered its appointed days, it died away like its predecessors, and "*Who are you?*" reigned in its stead. This new favourite, like a mushroom, seems to have sprung up in a night, or, like a frog in Cheapside, to have come down in a sudden shower. One day it was unheard, unknown, uninvented; the next it pervaded London. Every alley resounded with it; every highway was musical with it,

"And street to street, and lane to lane flung back
The one unvarying cry."

The phrase was uttered quickly, and with a sharp sound upon the first and last words, leaving the middle one little more than an aspiration. Like all its compeers which had been extensively popular, it was applicable to almost every variety of circumstance. The lovers

of a plain answer to a plain question did not like it at all. Insolence made use of it to give offence; ignorance to avoid exposing itself; and waggery to create laughter. Every new comer into an alehouse tap-room was asked unceremoniously, "*Who are you?*" and if he looked foolish, scratched his head, and did not know what to reply, shouts of boisterous merriment resounded on every side. An authoritative disputant was not unfrequently put down, and presumption of every kind checked by the same query. When its popularity was at its height, a gentleman, feeling the hand of a thief in his pocket, turned suddenly round and caught him in the act, exclaiming, "*Who are you?*" The mob which gathered round applauded to the very echo, and thought it the most capital joke they had ever heard, the very acmé of wit, the very essence of humour. Another circumstance of a similar kind gave an additional fillip to the phrase, and infused new life and vigour into it just as it was dying away. The scene occurred in the chief criminal court of the kingdom. A prisoner stood at the bar; the offence with which he had been charged was clearly proved against him; his counsel had been heard, not in his defence, but in extenuation, insisting upon his previous good life and character as reasons for the lenity of the court. "And where are your witnesses?" inquired the learned judge who presided. "Please you, my lord, I know the prisoner at the bar, and a more honest feller never breathed," said a rough voice in the gallery. The officers of the court looked aghast, and the strangers tittered with ill-suppressed laughter. "*Who are you?*" said the judge, looking suddenly up, but with imperturbable gravity. The court was convulsed; the titter broke out into a laugh; and it was several minutes before silence and decorum could be restored. When the ushers recovered their self-

possession, they made diligent search for the profane transgressor; but he was not to be found. Nobody knew him; nobody had seen him. After a while the business of the court again proceeded. The next prisoner brought up for trial augured favourably of his prospects when he learned that the solemn lips of the representative of justice had uttered the popular phrase as if he felt and appreciated it. There was no fear that such a judge would use undue severity. His heart was with the people; he understood their language and their manners, and would make allowances for the temptations which drove them into crime. So thought many of the prisoners, if we may infer it from the fact that the learned judge suddenly acquired an immense increase of popularity. The praise of his wit was in every mouth, and "*Who are you?*" renewed its lease, and remained in possession of public favour for another term in consequence.

But it must not be supposed that there were no interregna between the dominion of one slang phrase and another. They did not arise in one long line of unbroken succession, but shared with song the possession of popular favour. Thus, when the people were in the mood for music, slang advanced its claims to no purpose; and when they were inclined for slang, the sweet voice of music wooed them in vain. About thirty years ago London resounded with one chorus, with the love of which every body seemed to be smitten. Girls and boys, young men and old, maidens and wives and widows, were all alike musical. There was an absolute mania for singing; and the worst of it was, that, like good Father Philip in the romance of *The Monastery*, they seemed utterly unable to change their tune. "Cherry ripe!" "Cherry ripe!" was the universal cry of all the idle in the town. Every unmelodious voice gave utterance to it; every crazy fiddle, every

cracked flute, every wheezy pipe, every street-organ was heard in the same strain, until studious and quiet men stopped their ears in desperation, or fled miles away into the fields or woodlands to be at peace. This plague lasted for a twelvemonth, until the very name of cherries became an abomination in the land. At last the excitement wore itself away, and the tide of favour set in a new direction. Whether it was another song or a slang phrase is difficult to determine at this distance of time; but certain it is, that very shortly afterwards people went mad upon a dramatic subject, and nothing was to be heard of but "*Tommy and Jerry.*" Verbal wit had amused the multitude long enough, and they became more practical in their recreation. Every youth on the town was seized with the fierce desire of distinguishing himself by knocking down the "*charlies,*" being locked up all night in a watch-house, or kicking up a row among loose women and blackguard men in the low dens of St. Giles's. Imitative boys vied with their elders in similar exploits, until this unworthy passion (for such it was) had lasted, like other follies, its appointed time, and the town became merry after another fashion. It was next thought the height of vulgar wit to answer all questions by placing the point of the thumb upon the tip of the nose, and twirling the fingers in the air. If one man wished to insult or annoy another, he had only to make use of this cabalistic sign in his face, and his object was accomplished. At every street-corner where a group was assembled, the spectator who was curious enough to observe their movements would be sure to see the fingers of some of them at their noses, either as a mark of incredulity, surprise, refusal, or mockery, before he had watched two minutes. There is some remnant of this

absurd custom to be seen to this day; but it is thought low even among the vulgar.

About sixteen years ago, London became again most preposterously musical. The *vox populi* wore itself hoarse by singing the praises of “The Sea, the Sea!” If a stranger (and a philosopher) had walked through London, and listened to the universal chorus, he might have constructed a very pretty theory upon the love of the English for the sea-service, and our acknowledged superiority over all other nations upon that element. “No wonder,” he might have said, “that this people is invincible upon the ocean. The love of it mixes with their daily thoughts; they celebrate it even in the market-place; their street-minstrels excite charity by it; and high and low, young and old, male and female, chant *lo pæans* in its praise. Love is not honoured in the national songs of this warlike race—Bacchus is no god to them; they are men of sterner mould, and think only of ‘the Sea, the Sea!’ and the means of conquering upon it.”

Such would, doubtless, have been his impression if he had taken the evidence only of his ears. Alas, in those days for the refined ears that *were* musical! great was their torture when discord, with its thousand diversities of tone, struck up this appalling anthem—there was no escape from it. The migratory minstrels of Savoy caught the strain, and pealed it down the long vistas of quiet streets, till their innermost and snugest apartments re-echoed with the sound. Men were obliged to endure this crying evil for full six months, wearied to desperation, and made *sea-sick* on the dry land.

Several other songs sprang up in due succession, afterwards, but none of them, with the exception of one, entitled “All round my Hat,” enjoyed any extraordinary share of favour, until an American actor

introduced a vile song called “Jim Crow.” The singer sang his verses in appropriate costume, with grotesque gesticulations, and a sudden whirl of his body at the close of each verse. It took the taste of the town immediately, and for months the ears of orderly people were stunned by the senseless chorus—

“Turn about and wheel about,
And do just so—
Turn about and wheel about,
And jump, Jim Crow!”

Street-minstrels blackened their faces in order to give proper effect to the verses; and fatherless urchins, who had to choose between thieving and singing for their livelihood, took the latter course, as likely to be the more profitable, as long as the public taste remained in that direction. The uncouth dance, its accompaniment, might be seen in its full perfection on market nights in any great thoroughfare; and the words of the song might be heard, piercing above all the din and buzz of the ever-moving multitude. He, the calm observer, who during the hey-day popularity of this doggrel,

“Sate beside the public way,
Thick strewn with summer dust, and saw the stream
Of people there was hurrying to and fro,
Numerous as gnats upon the evening gleam,”

might have exclaimed with Shelley, that

“The million, with fierce song and maniac dance,
Did rage around.”

The philosophic theorist we have already supposed soliloquising upon the English character, and forming his opinion of it from their exceeding love for a sea-song, might, if he had again dropped suddenly into London, have formed another very plausible theory to account for our unremitting efforts for the abolition of the slave-trade. “Benevolent people!” he might have said, “how unbounded are your sympathies! Your unhappy brethren of Africa, differing from you only in the colour of their skins, are so dear to you, and you begrudge so little the twenty millions you have paid on their behalf, that you love to have a memento of them continually in your sight. Jim Crow is the representative of that injured race, and as such is the idol of your populace! See how they all sing his praises! how they imitate his peculiarities! how they repeat his name in their moments of leisure and relaxation! They even carve images of him to adorn their hearths, that his cause and his sufferings may never be forgotten! Oh, philanthropic England! oh, vanguard of civilisation!”

Such are a few of the peculiarities of the London multitude, when no riot, no execution, no murder, no balloon, disturbs the even current of their thoughts. These are the whimsies of the mass—the harmless follies by which they unconsciously endeavour to lighten the load of care which presses upon their existence. The wise man, even though he smile at them, will not altogether withhold his sympathy, and will say, “Let them enjoy their slang phrases and their choruses if they will; and if they cannot be happy, at least let them be merry.” To the Englishman, as well as to the Frenchman of whom

Beranger sings, there may be some comfort in so small a thing as a song, and we may own with him that

“Au peuple attristé
Ce qui rendra la gaîté,
C’est la GAUDRIOLE!
O gué!
C’est la GAUDRIOLE!”



SHERWOOD FOREST.

POPULAR ADMIRATION OF GREAT THIEVES.

Jack. Where shall we find such another set of practical philosophers, who,
to a man, are above the fear of death!

Wat. Sound men and true!

Robin. Of tried courage and indefatigable industry!

Ned. Who is there here that would not die for his friend?

Harry. Who is there here that would betray him for his interest?

Mat. Shew me a gang of courtiers that could say as much!

Dialogue of Thieves in the Beggar's Opera.

WHETHER it be that the multitude, feeling the pangs of poverty, sympathise with the daring and ingenious depredators who take away the rich man's superfluity, or whether it be the interest that mankind in general feel for the records of perilous adventure, it is certain that the populace of all countries look with admiration upon great and successful thieves. Perhaps both these causes combine to invest their career with charms in the popular eye. Almost every country in Europe has its traditional thief, whose exploits are recorded with all the graces of poetry, and whose trespasses

“Are cited up in rhymes,
And sung by children in succeeding tunes.”⁴⁵

Those travellers who have made national manners and characteristics their peculiar study, have often observed and remarked upon this feeling. The learned Abbé le Blanc, who resided for some time in England at the commencement of the eighteenth century, says, in his amusing letters on the English and French nations, that he continually met with Englishmen

who were not less vain in boasting of the success of their highwaymen than of the bravery of their troops. Tales of their address, their cunning, or their generosity, were in the mouths of every body, and a noted thief was a kind of hero in high repute. He adds that the mob, in all countries, being easily moved, look in general with concern upon criminals going to the gallows; but an English mob looked upon such scenes with extraordinary interest: they delighted to see them go through their last trials with resolution, and applauded those who were insensible enough to die as they had lived, braving the justice both of God and men: such, he might have added, as the noted robber Macpherson, of whom the old ballad says:

“Sae rantingly, sae wantonly,
Sae dauntingly gaed he:
He played a spring, and danced it round
Beneath the gallows tree.”

Among these traditional thieves the most noted in England, or perhaps in any country, is Robin Hood, a name which popular affection has encircled with a peculiar halo. “He robbed the rich to give to the poor;” and his reward has been an immortality of fame, a tithe of which would be thought more than sufficient to recompense a benefactor of his species. Romance and poetry have been emulous to make him all their own; and the forest of Sherwood, in which he roamed with his merry men, armed with their long bows, and clad in Lincoln green, has become the resort of pilgrims, and a classic spot sacred to his memory. The few virtues he had, which would have ensured him no praise if he had been an honest man, have been blazoned forth by popular renown during seven successive centuries, and will never be forgotten while the English tongue endures. His charity to the poor, and his gallantry and respect for women, have made him the pre-eminent thief of all the world.

Among English thieves of a later date, who has not heard of Claude Duval, Dick Turpin, Jonathan Wild, and Jack Sheppard, those knights of the road and of the town, whose peculiar chivalry formed at once the dread and the delight of England during the eighteenth century? Turpin's fame is unknown to no portion of the male population of England after they have attained the age of ten. His wondrous ride from London to York has endeared him to the imagination of millions; his cruelty in placing an old woman upon a fire, to force her to tell him where she had hidden her money, is regarded as a good joke; and his proud bearing upon the scaffold is looked upon as a virtuous action. The Abbé le Blanc, writing in 1737, says he was continually entertained with stories of Turpin—how, when he robbed gentlemen, he would generously leave them enough to continue their journey, and exact a pledge from them never to inform against him, and how scrupulous such gentlemen were in keeping their word. He was one day told a story with which the relator was in the highest degree delighted. Turpin, or some other noted robber, stopped a man whom he knew to be very rich, with the usual salutation—"Your money or your life!" but not finding more than five or six guineas about him, he took the liberty of entreating him, in the most affable manner, never to come out so ill provided; adding that, if he fell in with him, and he had no more than such a paltry sum, he would give him a good licking. Another story, told by one of Turpin's admirers, was of a robbery he had committed upon a Mr. C. near Cambridge. He took from this gentleman his watch, his snuff-box, and all his money but two shillings, and, before he left him, required his word of honour that he would not cause him to be pursued or brought before a justice. The promise being given, they both parted very courteously. They afterwards met at Newmarket, and renewed their acquaintance. Mr. C. kept his word religiously; he not only refrained from giving Turpin into custody, but made a boast that he had fairly won some of his money back again in an honest way. Turpin offered to bet with him on some favourite horse, and Mr. C. accepted the wager with as good a grace as he could have

done from the best gentleman in England. Turpin lost his bet and paid it immediately, and was so smitten with the generous behaviour of Mr. C., that he told him how deeply he regretted that the trifling affair which had happened between them did not permit them to drink together. The narrator of this anecdote was quite proud that England was the birthplace of such a highwayman.⁴⁶

Not less familiar to the people of England is the career of Jack Sheppard, as brutal a ruffian as ever disgraced his country, but who has claims upon the popular admiration which are very generally acknowledged. He did not, like Robin Hood, plunder the rich to relieve the poor, nor rob with an uncouth sort of courtesy, like Turpin; but he escaped from Newgate with the fetters on his limbs. This achievement, more than once repeated, has encircled his felon brow with the wreath of immortality, and made him quite a pattern thief among the populace. He was no more than twenty-three years of age at the time of his execution, and he died much pitied by the crowd. His adventures were the sole topics of conversation for months; the print-shops were filled with his effigies, and a fine painting of him was made by Sir Richard Thornhill. The following complimentary verses to the artist appeared in the *British Journal* of November 28th, 1724:

“Thornhill! ’tis thine to gild with fame
Th’ obscure, and raise the humble name;
To make the form elude the grave,
And Sheppard from oblivion save!

Apelles Alexander drew—
Cæsar is to Aurelius due;
Cromwell in Lilly’s works doth shine,
And Sheppard, Thornhill, lives in thine!”

This was a very equivocal sort of compliment, and might have meant, that if Apelles were worthy to paint a monarch, Thornhill was worthy to paint a thief. But the artist did not view it in that light, nor did the public; for they considered the verses to be very neat, pointed, and flattering. So high was Jack's fame, that he was thought a very fit subject for the stage; and a pantomime entertainment, called "*Harlequin Jack Sheppard*," was devised by one Thurmond, and brought out with considerable success at Drury Lane Theatre. All the scenes were painted from nature, including the public-house that the robber frequented in Clare Market, and the condemned cell from which he had made his escape in Newgate.⁴⁷

The Rev. Mr. Vilette, the editor of the *Annals of Newgate*, published in 1754, relates a curious sermon, which he says a friend of his heard delivered by a street-preacher about the time of Jack's execution. The orator, after animadverting on the great care men took of their bodies, and the little care they bestowed upon their souls, continued as follows, by way of exemplifying the position:—"We have a remarkable instance of this in a notorious malefactor, well known by the name of Jack Sheppard. What amazing difficulties has he overcome! what astonishing things has he performed! and all for the sake of a stinking, miserable carcass, hardly worth the hanging! How dexterously did he pick the chain of his padlock with a crooked nail! how manfully he burst his fetters asunder, climb up the chimney, wrench out an iron bar, break his way through a stone wall, make the strong door of a dark entry fly before him, till he got upon the leads of the prison, then, fixing a blanket to the wall with a spike, he stole out of the chapel! How intrepidly did he descend to the top of the turner's house! how cautiously pass down the stair, and make his escape to the street-door!

"Oh, that ye were all like Jack Sheppard! Mistake me not, my brethren—I don't mean in a carnal, but in a spiritual sense; for I propose to spiritualise these things. What a shame it would be if we

should not think it worth our while to take as much pains, and employ as many deep thoughts to save our souls as he has done to preserve his body!

“Let me exhort ye, then, to open the locks of your hearts with the nail of repentance! Burst asunder the fetters of your beloved lusts, mount the chimney of hope, take from thence the bar of good resolution, break through the stone wall of despair, and all the strongholds in the dark entry of the valley of the shadow of death! Raise yourselves to the leads of divine meditation, fix the blanket of faith with the spike of the Church, let yourselves down to the turner’s house of resignation, and descend the stairs of humility! So shall you come to the door of deliverance from the prison of iniquity, and escape the clutches of that old executioner the devil!”

Jonathan Wild, whose name has been immortalised by Fielding, was no favourite with the people. He had none of the virtues which, combined with crimes, make up the character of the great thief. He was a pitiful fellow, who informed against his comrades, and was afraid of death. This meanness was not to be forgiven by the crowd; and they pelted him with dirt and stones on his way to Tyburn, and expressed their contempt by every possible means. How different was their conduct to Turpin and Jack Sheppard, who died in their neatest attire, with nosegays in their button-holes, and with the courage that a crowd expects. It was anticipated that the body of Turpin would have been delivered up to the surgeons for dissection; and the people seeing some men very busily employed in removing it, suddenly set upon them, rescued the body, bore it about the town in triumph, and then buried it in a very deep grave, filled with quicklime, to hasten the progress of decomposition. They would not suffer the corpse of their hero—of the man who had ridden from London to York in four-and-twenty hours—to be mangled by the rude hands of unmannerly surgeons.

The death of Claude Duval would appear to have been no less triumphant. Claude was a gentlemanly thief. According to Butler, in the famous ode to his memory, he

“Taught the wild Arabs of the road
To rob in a more gentle mode;
Take prizes more obligingly than those
Who never had been bred *filous*;
And how to hang in a more graceful fashion
Than e’er was known before to the dull English nation.”

In fact, he was the pink of politeness, and his gallantry to the fair sex was proverbial. When he was caught at last, pent in “stone walls and chains and iron grates,” their grief was in proportion to his rare merits and his great fame. Butler says, that to his dungeon

“Came ladies from all parts,
To offer up close prisoners their hearts.
Which he received as tribute due—
* * * *
Never did bold knight to relieve
Distressed dames, such dreadful feats achieve,
As feeble damsels for his sake
Would have been proud to undertake,
And, bravely ambitious to redeem
The world’s loss and their own,
Strove who should have the honour to lay down,
And change a life with him.”

Among the noted thieves of France, there is none to compare with the famous Aimerigot Têtenoire, who flourished in the reign of Charles VI. This fellow was at the head of four or five hundred men, and possessed two very strong castles in Limousin and Auvergne. There was a good deal of the feudal baron about him, although he possessed no revenues but such as the road afforded him. At his death he left a singular will. "I give and bequeath," said the robber, "one thousand five hundred francs to St. George's Chapel, for such repairs as it may need; to my sweet girl, who so loyally loved me, I give two thousand five hundred; and the surplus I give to my companions. I hope they will all live as brothers, and divide it amicably among them. If they cannot agree, and the devil of contention gets among them, it is no fault of mine; and I advise them to get a good strong sharp axe, and break open my strong box. Let them scramble for what it contains, and the devil seize the hindmost." The people of Auvergne still recount with admiration the daring feats of this brigand.

Of later years, the French thieves have been such unmitigated scoundrels as to have left but little room for popular admiration. The famous Cartouche, whose name has become synonymous with ruffian in their language, had none of the generosity, courtesy, and devoted bravery which are so requisite to make a robber-hero. He was born at Paris, towards the end of the seventeenth century, and broken alive on the wheel in November 1727. He was, however, sufficiently popular to have been pitied at his death, and afterwards to have formed the subject of a much-admired drama, which bore his name, and was played with great success in all the theatres of France during the years 1734, 5, and 6. In our own day the French have been more fortunate in a robber; Vidocq bids fair to rival the fame of Turpin and Jack Sheppard. Already he has become the hero of many an apocryphal tale—already his compatriots boast of his manifold achievements, and express their doubts whether any other country in Europe could produce a thief so clever, so accomplished, so gentlemanly, as Vidocq.

Germany has its Schinderhannes, Hungary its Schubry, and Italy and Spain a whole host of brigands, whose names and exploits are familiar as household words in the mouths of the children and populace of those countries.

The Italian banditti are renowned over the world; and many of them are not only very religious (after a fashion) but very charitable. Charity from such a source is so unexpected, that the people doat upon them for it. One of them, when he fell into the hands of the police, exclaimed, as they led him away, “Ho fatto più carità!”—“I have given away more in charity than any three convents in these provinces.” And the fellow spoke truth.

In Lombardy, the people cherish the memory of two notorious robbers, who flourished about two centuries ago under the Spanish government. Their story, according to Macfarlane, is contained in a little book well known to all the children of the province, and read by them with much more gusto than their Bibles.

Schinderhannes, the robber of the Rhine, is a great favourite on the banks of the river which he so long kept in awe. Many amusing stories are related by the peasantry⁴⁸ of the scurvy tricks he played off upon rich Jews, or too-presuming officers of justice—of his princely generosity, and undaunted courage. In short, they are proud of him, and would no more consent to have the memory of his achievements dissociated from their river than they would have the rock of Ehrenbreitstein blown to atoms by gunpowder.

There is another robber-hero, of whose character and exploits the people of Germany speak admiringly. Mausch Nadel was captain of a considerable band that infested the Rhine, Switzerland, Alsatia, and Lorraine, during the years 1824, 5, and 6. Like Jack Sheppard, he endeared himself to the populace by his most hazardous escape from prison. Being confined at Bremen, in a dungeon on the third story of the prison of that town, he contrived to let himself down without exciting the vigilance of the sentinels, and to swim across the Weser, though heavily laden with irons.

When about half-way over, he was espied by a sentinel, who fired at him, and shot him in the calf of the leg: but the undaunted robber struck out manfully, reached the shore, and was out of sight before the officers of justice could get ready their boats to follow him. He was captured again in 1826, tried at Mayence, and sentenced to death. He was a tall, strong, handsome man, and his fate, villain as he was, excited much sympathy all over Germany. The ladies especially were loud in their regret that nothing could be done to save a hero so good-looking, and of adventures so romantic, from the knife of the headsman.

Mr. Charles Macfarlane, in speaking of Italian banditti, remarks, that the abuses of the Catholic religion, with its confessions and absolutions, have tended to promote crime of this description. But he adds more truly, that priests and monks have not done half the mischief which has been perpetrated by ballad-mongers and story-tellers. If he had said playwrights also, the list would have been complete. In fact, the theatre, which can only expect to prosper, in a pecuniary sense, by pandering to the tastes of the people, continually recurs to the annals of thieves and banditti for its most favourite heroes. These theatrical robbers, with their picturesque attire, wild haunts, jolly, reckless, devil-may-care manners, take a wonderful hold upon the imagination, and whatever their advocates may say to the contrary, exercise a very pernicious influence upon public morals. In the Memoirs of the Duke of Guise upon the Revolution of Naples in 1647 and 1648, it is stated, that the manners, dress, and mode of life of the Neapolitan banditti were rendered so captivating upon the stage, that the authorities found it absolutely necessary to forbid the representation of dramas in which they figured, and even to prohibit their costume at the masquerades. So numerous were the banditti at this time, that the duke found no difficulty in raising an army of them, to aid him in his endeavours to seize on the throne of Naples. He thus describes them:⁴⁹ “They were three thousand five hundred men, of whom the oldest came short of five-and-forty years, and the youngest was above twenty. They were all tall and

well made, with long black hair, for the most part curled; coats of black Spanish leather, with sleeves of velvet, or cloth of gold; cloth breeches with gold lace, most of them scarlet; girdles of velvet, laced with gold, with two pistols on each side; a cutlass hanging at a belt, suitably trimmed, three fingers broad and two feet long; a hawking-bag at their girdle, and a powder-flask hung about their neck with a great silk riband. Some of them carried firelocks, and others blunderbusses; they had all good shoes, with silk stockings, and every one a cap of cloth of gold, or cloth of silver, of different colours, on his head, which was very delightful to the eye.”

The Beggar’s Opera, in our own country, is another instance of the admiration that thieves excite upon the stage. Of the extraordinary success of this piece, when first produced, the following account is given in the notes to *The Dunciad*, and quoted by Johnson in his *Lives of the Poets*: “This piece was received with greater applause than was ever known. Besides being acted in London sixty-three days without interruption, and renewed the next season with equal applause, it spread into all the great towns of England; was played in many places to the thirtieth and fortieth time; at Bath and Bristol, &c. fifty. It made its progress into Wales, Scotland, and Ireland, where it was performed twenty-four days successively. The ladies carried about with them the favourite songs of it in fans, and houses were furnished with it in screens. The fame of it was not confined to the author only. The person who acted Polly, till then obscure, became all at once the favourite of the town;⁵⁰ her pictures were engraved and sold in great numbers; her life written, books of letters and verses to her published, and pamphlets made even of her sayings and jests. Furthermore, it drove out of England, for that season, the Italian Opera, which had carried all before it for ten years.” Dr. Johnson, in his life of the author, says, that Herring, afterwards Archbishop of Canterbury, censured the opera, as giving encouragement, not only to vice, but to crimes, by making the highwayman the hero, and dismissing him at last unpunished; and adds, that it was even said, that after the exhibition the gangs of

robbers were evidently multiplied. The Doctor doubts the assertion, giving as his reason that highwaymen and housebreakers seldom frequent the playhouse, and that it was not possible for any one to imagine that he might rob with safety, because he saw Macheath reprieved upon the stage. But if Johnson had wished to be convinced, he might very easily have discovered that highwaymen and housebreakers did frequent the theatre, and that nothing was more probable than that a laughable representation of successful villany should induce the young and the already vicious to imitate it. Besides, there is the weighty authority of Sir John Fielding, the chief magistrate of Bow Street, who asserted positively, and proved his assertion by the records of his office, that the number of thieves was greatly increased at the time when that opera was so popular.

We have another instance of the same result much nearer our own times. Schiller's *Räuber*, that wonderful play, written by a green youth, perverted the taste and imagination of all the young men in Germany. An accomplished critic of our own country (Hazlitt), speaking of this play, says it was the first he ever read, and such was the effect it produced on him, that "it stunned him, like a blow." After the lapse of five-and-twenty years, he could not forget it; it was still, to use his own words, "an old dweller in the chambers of his brain," and he had not even then recovered enough from it to describe how it was. The high-minded, metaphysical thief, its hero, was so warmly admired, that several raw students, longing to imitate a character they thought so noble, actually abandoned their homes and their colleges, and betook themselves to the forests and the wilds to levy contributions upon travellers. They thought they would, like Moor, plunder the rich, and deliver eloquent soliloquies to the setting sun or the rising moon; relieve the poor when they met them, and drink flasks of Rhenish with their free companions in rugged mountain passes, or in tents in the thicknesses of the forests. But a little experience wonderfully cooled their courage; they found that real, everyday robbers were very unlike the conventional banditti of the stage, and that three months in prison, with

bread and water for their fare, and damp straw to lie upon, was very well to read about by their own firesides, but not very agreeable to undergo in their own proper persons.

Lord Byron, with his soliloquising, high-souled thieves, has, in a slight degree, perverted the taste of the juvenile rhymers of his country. As yet, however, they have shewn more good sense than their fellows of Germany, and have not taken to the woods or the highways. Much as they admire Conrad the Corsair, they will not go to sea, and hoist the black flag for him. By words only, and not by deeds, they testify their admiration, and deluge the periodicals and music-shops of the land with verses describing pirates' and bandits' brides, and robber adventures of every kind.

But it is the playwright who does most harm; and Byron has fewer sins of this nature to answer for than Gay or Schiller. With the aid of scenery, fine dresses and music, and the very false notions they convey, they vitiate the public taste, not knowing,

“Vulgaires rimeurs!

Quelle force ont les arts pour demolir les mœurs.”

In the penny theatres that abound in the poor and populous districts of London, and which are chiefly frequented by striplings of idle and dissolute habits, tales of thieves and murderers are more admired, and draw more crowded audiences, than any other species of representation. There the footpad, the burglar, and the highwayman are portrayed in their natural colours, and give pleasant lessons in crime to their delighted listeners. There the deepest tragedy and the broadest farce are represented in the career of the murderer and the thief, and are applauded in proportion to their depth and their breadth. There, whenever a crime of unusual atrocity is committed, it is brought out afresh, with all its disgusting incidents

copied from the life, for the amusement of those who will one day become its imitators.

With the mere reader the case is widely different; and most people have a partiality for knowing the adventures of noted rogues. Even in fiction they are delightful: witness the eventful story of Gil Blas de Santillane, and of that great rascal Don Guzman d'Alfarache. Here there is no fear of imitation. Poets, too, without doing mischief, may sing of such heroes when they please, wakening our sympathies for the sad fate of Jemmy Dawson, or Gilderoy, or Macpherson the Dauntless; or celebrating in undying verse the wrongs and the revenge of the great thief of Scotland, Rob Roy. If, by the music of their sweet rhymes, they can convince the world that such heroes are but mistaken philosophers, born a few ages too late, and having both a theoretical and practical love for

“The good old rule, the simple plan,
That they should take who have the power,
That they should keep who can;”

the world may perhaps become wiser, and consent to some better distribution of its good things, by means of which thieves may become reconciled to the age, and the age to them. The probability, however, seems to be, that the charmers will charm in vain, charm they ever so wisely.



FIGHT BETWEEN DU GUESCLIN AND TROUSSEL.

DUELS AND ORDEALS.

There was an ancient sage philosopher,
Who swore the world, as he could prove,
Was mad of fighting.—*Hudibras*.

MOST writers, in accounting for the origin of duelling, derive it from the warlike habits of those barbarous nations who overran Europe in the early centuries of the Christian era, and who knew no mode so effectual for settling their differences as the point of the sword. In fact, duelling, taken in its primitive and broadest sense, means nothing more than combating, and is the universal resort of all wild animals, including man, to gain or defend their possessions, or avenge their insults. Two dogs who tear each other for a bone, or two bantams fighting on a dunghill for the love of some beautiful hen, or two fools on Wimbledon Common, shooting at each other to satisfy the laws of offended honour, stand on the same footing in this respect, and are each and all mere duellists. As civilisation advanced, the best-informed men naturally grew ashamed of such a mode of adjusting disputes, and the promulgation of some sort of laws for obtaining redress for injuries was the consequence. Still there were many cases in which the allegations of an accuser could not be rebutted by any positive proof on the part of the accused; and in all these, which must have been exceedingly numerous in the early stages of European society, the combat was resorted to. From its decision there was no appeal. God was supposed to nerve the arm of the combatant whose cause was just, and to grant him the victory over his opponent. As Montesquieu well remarks,⁵¹ this belief was not unnatural among a people just emerging from barbarism. Their manners

being wholly warlike, the man deficient in courage, the prime virtue of his fellows, was not unreasonably suspected of other vices besides cowardice, which is generally found to be co-existent with treachery. He, therefore, who shewed himself most valiant in the encounter was absolved by public opinion from any crime with which he might be charged. As a necessary consequence, society would have been reduced to its original elements, if the men of thought, as distinguished from the men of action, had not devised some means for taming the unruly passions of their fellows. With this view, governments commenced by restricting within the narrowest possible limits the cases in which it was lawful to prove or deny guilt by the single combat. By the law of Gondebaldus king of the Burgundians, passed in the year 501, the proof by combat was allowed in all legal proceedings in lieu of swearing. In the time of Charlemagne, the Burgundian practice had spread over the empire of the Franks, and not only the suitors for justice, but the witnesses, and even the judges, were obliged to defend their cause, their evidence, or their decision at the point of the sword. Louis the Debonnaire, his successor, endeavoured to remedy the growing evil by permitting the duel only in appeals of felony, in civil cases, or issue joined in a writ of right, and in cases of the court of chivalry, or attacks upon a man's knighthood. None were exempt from these trials but women, the sick and the maimed, and persons under fifteen or above sixty years of age. Ecclesiastics were allowed to produce champions in their stead. This practice in the course of time extended to all trials of civil and criminal cases, which had to be decided by battle.

The clergy, whose dominion was an intellectual one, never approved of a system of jurisprudence which tended so much to bring all things under the rule of the strongest arm. From the first they set their faces against duelling, and endeavoured, as far as the prejudices of their age would allow them, to curb the warlike spirit, so alien from the principles of religion. In the Council of Valentia, and afterwards in the Council of Trent, they excommunicated all persons engaged in duelling; and not only them, but

even the assistants and spectators, declaring the custom to be hellish and detestable, and introduced by the devil for the destruction both of body and soul. They added also, that princes who connived at duels should be deprived of all temporal power, jurisdiction, and dominion over the places where they had permitted them to be fought. It will be seen hereafter that this clause only encouraged the practice which it was intended to prevent.

But it was the blasphemous error of these early ages to expect that the Almighty, whenever he was called upon, would work a miracle in favour of a person unjustly accused. The priesthood, in condemning the duel, did not condemn the principle on which it was founded. They still encouraged the popular belief of divine interference in all the disputes or differences that might arise among nations or individuals. It was the very same principle that regulated the ordeals, which with all their influence they supported against the duel. By the former, the power of deciding the guilt or innocence was vested wholly in their hands; while by the latter they enjoyed no power or privilege at all. It is not to be wondered at that, for this reason, if for no other, they should have endeavoured to settle all differences by the peaceful mode. While that prevailed, they were, as they wished to be, the first party in the state; but while the strong arm of individual prowess was allowed to be the judge in all doubtful cases, their power and influence became secondary to those of the nobility.

Thus it was not the mere hatred of bloodshed which induced them to launch the thunderbolts of excommunication against the combatants: it was a desire to retain the power, which, to do them justice, they were in those times the persons best qualified to wield. The germs of knowledge and civilisation lay within the bounds of their order; for they were the representatives of the intellectual, as the nobility were of the physical power of man. To centralise this power in the Church, and make it the judge of the last resort in all appeals, both in civil and criminal cases, they instituted five modes of trial, the management of which lay wholly in their hands. These were, the oath upon the evangelists; the ordeal of the cross

and the fire ordeal, for persons in the higher ranks; the water ordeal, for the humbler classes; and, lastly, the *corsned*, or bread and cheese ordeal, for members of their own body.

The oath upon the evangelists was taken in the following manner. The accused who was received to this proof, says Paul Hay, Count du Chastelet, in his *Memoirs of Bertrand du Guesclin*, swore upon a copy of the New Testament, and on the relics of the holy martyrs, or on their tombs, that he was innocent of the crime imputed to him. He was also obliged to find twelve persons of acknowledged probity who should take oath at the same time that they believed him innocent. This mode of trial led to very great abuses, especially in cases of disputed inheritance, where the hardest swearer was certain of the victory. This abuse was one of the principal causes which led to the preference given to the trial by battle. It is not at all surprising that a feudal baron, or captain of the early ages, should have preferred the chances of a fair fight with his opponent to a mode by which firm perjury would always be successful.

The trial by, or judgment of, the cross, which Charlemagne begged his sons to have recourse to, in case of disputes arising between them, was performed thus:—When a person accused of any crime had declared his innocence upon oath, and appealed to the cross for its judgment in his favour, he was brought into the church, before the altar. The priests previously prepared two sticks exactly like one another, upon one of which was carved a figure of the cross. They were both wrapped up with great care and many ceremonies, in a quantity of fine wool, and laid upon the altar, or on the relics of the saints. A solemn prayer was then offered up to God, that he would be pleased to discover, by the judgment of his holy cross, whether the accused person were innocent or guilty. A priest then approached the altar, and took up one of the sticks, and the assistants unswathed it reverently. If it was marked with the cross, the accused person was innocent; if unmarked, he was guilty. It would be unjust to assert, that the judgments thus delivered were, in all cases, erroneous; and

it would be absurd to believe that they were left altogether to chance. Many true judgments were doubtless given, and, in all probability, most conscientiously; for we cannot but believe that the priests endeavoured beforehand to convince themselves by secret inquiry and a strict examination of the circumstances, whether the appellant were innocent or guilty, and that they took up the crossed or uncrossed stick accordingly. Although, to all other observers, the sticks, as enfolded in the wool, might appear exactly similar, those who enwrapped them could, without any difficulty, distinguish the one from the other.

By the fire-ordeal the power of deciding was just as unequivocally left in their hands. It was generally believed that fire would not burn the innocent, and the clergy, of course, took care that the innocent, or such as it was their pleasure or interest to declare so, should be so warned before undergoing the ordeal, as to preserve themselves without any difficulty from the fire. One mode of ordeal was to place red-hot ploughshares on the ground at certain distances, and then, blindfolding the accused person, make him walk barefooted over them. If he stepped regularly in the vacant spaces, avoiding the fire, he was adjudged innocent; if he burned himself, he was declared guilty. As none but the clergy interfered with the arrangement of the ploughshares, they could always calculate beforehand the result of the ordeal. To find a person guilty, they had only to place them at irregular distances, and the accused was sure to tread upon one of them. When Emma, the wife of King Ethelred, and mother of Edward the Confessor, was accused of a guilty familiarity with Alwyn Bishop of Winchester, she cleared her character in this manner. The reputation, not only of their order, but of a queen, being at stake, a verdict of guilty was not to be apprehended from any ploughshares which priests had the heating of. This ordeal was called the *Judicium Dei*, and sometimes the *Vulgaris Purgatio*, and might also be tried by several other methods. One was to hold in the hand, unhurt, a piece of red-hot iron, of the weight of one, two, or three pounds. When we read not only that men with hard hands, but

women of softer and more delicate skin, could do this with impunity, we must be convinced that the hands were previously rubbed with some preservative, or that the apparently hot iron was merely cold iron painted red. Another mode was to plunge the naked arm into a caldron of boiling water. The priests then enveloped it in several folds of linen and flannel, and kept the patient confined within the church, and under their exclusive care, for three days. If, at the end of that time, the arm appeared without a scar, the innocence of the accused person was firmly established.⁵²

As regards the water-ordeal, the same trouble was not taken. It was a trial only for the poor and humble, and, whether they sank or swam, was thought of very little consequence. Like the witches of more modern times, the accused were thrown into a pond or river; if they sank, and were drowned, their surviving friends had the consolation of knowing that they were innocent; if they swam, they were guilty. In either case society was rid of them.

But of all the ordeals, that which the clergy reserved for themselves was the one least likely to cause any member of their corps to be declared guilty. The most culpable monster in existence came off clear when tried by this method. It was called the *Corsned*, and was thus performed. A piece of barley bread and a piece of cheese were laid upon the altar, and the accused priest, in his full canonicals, and surrounded by all the pompous adjuncts of Roman ceremony, pronounced certain conjurations, and prayed with great fervency for several minutes. The burden of the prayer was, that if he were guilty of the crime laid to his charge, God would send his angel Gabriel to stop his throat, that he might not be able to swallow the bread and cheese. There is no instance upon record of a priest having been choked in this manner.⁵³

When, under Pope Gregory VII., it was debated whether the Gregorian chant should be introduced into Castile, instead of the Musarabic, given by St. Isidore of Seville to the churches of that kingdom, very much ill feeling was excited. The churches refused to receive the novelty, and it was

proposed that the affair should be decided by a battle between two champions, one chosen from each side. The clergy would not consent to a mode of settlement which they considered impious, but had no objection to try the merits of each chant by the fire-ordeal. A great fire was accordingly made, and a book of the Gregorian and one of the Musarabic chant were thrown into it, that the flames might decide which was most agreeable to God by refusing to burn it. Cardinal Baronius, who says he was an eye-witness of the miracle, relates, that the book of the Gregorian chant was no sooner laid upon the fire, than it leaped out uninjured, visibly, and with a great noise. Every one present thought that the saints had decided in favour of Pope Gregory. After a slight interval, the fire was extinguished; but, wonderful to relate! the other book of St. Isidore was found covered with ashes, but not injured in the slightest degree. The flames had not even warmed it. Upon this it was resolved, that both were alike agreeable to God, and that they should be used by turns in all the churches of Seville.⁵⁴

If the ordeals had been confined to questions like this, the laity would have had little or no objection to them; but when they were introduced as decisive in all the disputes that might arise between man and man, the opposition of all those whose prime virtue was personal bravery, was necessarily excited. In fact, the nobility, from a very early period, began to look with jealous eyes upon them. They were not slow to perceive their true purport, which was no other than to make the Church the last court of appeal in all cases, both civil and criminal: and not only did the nobility prefer the ancient mode of single combat from this cause, in itself a sufficient one, but they clung to it because an acquittal gained by those displays of courage and address which the battle afforded, was more creditable in the eyes of their compeers, than one which it required but little or none of either to accomplish. To these causes may be added another, which was perhaps more potent than either in raising the credit of the judicial combat at the expense of the ordeal. The noble institution of chivalry was beginning to take root, and, notwithstanding the clamours of

the clergy, war was made the sole business of life, and the only elegant pursuit of the aristocracy. The fine spirit of honour was introduced, any attack upon which was only to be avenged in the lists, within sight of applauding crowds, whose verdict of approbation was far more gratifying than the cold and formal acquittal of the ordeal. Lothaire, the son of Louis I., abolished that by fire and the trial of the cross within his dominions; but in England they were allowed so late as the time of Henry III., in the early part of whose reign they were prohibited by an order of council. In the mean time, the Crusades had brought the institution of chivalry to the full height of perfection. The chivalric spirit soon achieved the downfall of the ordeal system, and established the judicial combat on a basis too firm to be shaken. It is true that with the fall of chivalry, as an institution, fell the tournament and the encounter in the lists; but the duel, their offspring, has survived to this day, defying the efforts of sages and philosophers to eradicate it. Among all the errors bequeathed to us by a barbarous age, it has proved the most pertinacious. It has put variance between men's reason and their honour; put the man of sense on a level with the fool, and made thousands who condemn it submit to it or practise it.

Those who are curious to see the manner in which these combats were regulated, may consult the learned Montesquieu, where they will find a copious summary of the code of ancient duelling.⁵⁵ Truly does he remark, in speaking of the clearness and excellence of the arrangements, that, as there were many wise matters which were conducted in a very foolish manner, so there were many foolish matters conducted very wisely. No greater exemplification of it could be given than the wise and religious rules of the absurd and blasphemous trial by battle.

In the ages that intervened between the Crusades and the new era that was opened out by the invention of gunpowder and printing, a more rational system of legislation took root. The inhabitants of cities, engaged in the pursuits of trade and industry, were content to acquiesce in the decisions of their judges and magistrates whenever any differences arose

among them. Unlike the class above them, their habits and manners did not lead them to seek the battle-field on every slight occasion. A dispute as to the price of a sack of corn, a bale of broad-cloth, or a cow, could be more satisfactorily adjusted before the mayor or bailiff of their district. Even the martial knights and nobles, quarrelsome as they were, began to see that the trial by battle would lose its dignity and splendour if too frequently resorted to. Governments also shared this opinion, and on several occasions restricted the cases in which it was legal to proceed to this extremity. In France, before the time of Louis IX., duels were permitted only in cases of *lèse majesté*, *rape*, *incendiarism*, *assassination*, and *burglary*. Louis IX., by taking off all restriction, made them legal in civil cases. This was not found to work well, and, in 1303, Philip the Fair judged it necessary to confine them, in criminal matters, to state offences, rape, and incendiarism; and in civil cases, to questions of disputed inheritance. Knighthood was allowed to be the best judge of its own honour, and might defend or avenge it as often as occasion arose.

Among the earliest duels upon record, is a very singular one that took place in the reign of Louis II. (A. D. 878). Ingelgerius count of Gastinois was one morning discovered by his countess dead in bed at her side. Gontran, a relation of the count, accused the countess of having murdered her husband, to whom, he asserted, she had long been unfaithful, and challenged her to produce a champion to do battle in her behalf, that he might establish her guilt by killing him.⁵⁶ All the friends and relatives of the countess believed in her innocence; but Gontran was so stout and bold and renowned a warrior that no one dared to meet him, for which, as Brantôme quaintly says, “mauvais et poltrons parens estaient.” The unhappy countess began to despair, when a champion suddenly appeared in the person of Ingelgerius count of Anjou, a boy of sixteen years of age, who had been held by the countess on the baptismal font, and received her husband’s name. He tenderly loved his godmother, and offered to do battle in her cause against any and every opponent. The king endeavoured to persuade

the generous boy from his enterprise, urging the great strength, tried skill, and invincible courage of the challenger; but he persisted in his resolution, to the great sorrow of all the court, who said it was a cruel thing to permit so brave and beautiful a child to rush to such butchery and death.



DUEL BETWEEN INGELGERIUS AND GONTRAN.

When the lists were prepared, the countess duly acknowledged her champion, and the combatants commenced the onset. Gontran rode so fiercely at his antagonist, and hit him on the shield with such impetuosity, that he lost his own balance and rolled to the ground. The young count, as Gontran fell, passed his lance through his body, and then dismounting, cut off his head, which, Brantôme says, “he presented to the king, who received it most graciously, and was very joyful, as much so as if any one had made him a present of a city.” The innocence of the countess was then proclaimed with great rejoicings; and she kissed her godson, and wept over his neck with joy, in the presence of all the assembly.

When the Earl of Essex was accused, by Robert de Montfort, before King Henry II., in 1162, of having traitorously suffered the royal standard of England to fall from his hands in a skirmish with the Welsh at Coleshill, five years previously, the latter offered to prove the truth of the charge by

single combat. The Earl of Essex accepted the challenge, and the lists were prepared near Reading. An immense concourse of persons assembled to witness the battle. Essex at first fought stoutly, but, losing his temper and self-command, he gave an advantage to his opponent which soon decided the struggle. He was unhorsed, and so severely wounded, that all present thought he was dead. At the solicitation of his relatives, the monks of the Abbey of Reading were allowed to remove the body for interment, and Montfort was declared the victor. Essex, however, was not dead, but stunned only, and, under the care of the monks, recovered in a few weeks from his bodily injuries. The wounds of his mind were not so easily healed. Though a loyal and brave subject, the whole realm believed him a traitor and a coward because he had been vanquished. He could not brook to return to the world deprived of the good opinion of his fellows; he therefore made himself a monk, and passed the remainder of his days within the walls of the abbey.

Du Chastelet relates a singular duel that was proposed in Spain.⁵⁷ A Christian gentleman of Seville sent a challenge to a Moorish cavalier, offering to prove against him, with whatever weapons he might choose, that the religion of Jesus Christ was holy and divine, and that of Mahomet impious and damnable. The Spanish prelates did not choose that Christianity should be compromised within their jurisdiction by the result of any such combat; the Moorish cavalier might, perchance, have proved to be the stronger, and they commanded the knight, under pain of excommunication, to withdraw the challenge.

The same author relates that, under Otho I., a question arose among jurisconsults, viz. whether grandchildren, who had lost their father, should share equally with their uncles in the property of their grandfather, at the death of the latter. The difficulty of this question was found so insurmountable, that none of the lawyers of that day could resolve it. It was at last decreed that it should be decided by single combat. Two champions were accordingly chosen; one for, and the other against, the claims of the

little ones. After a long struggle, the champion of the uncles was unhorsed and slain; and it was therefore decided that the right of the grandchildren was established, and that they should enjoy the same portion of their grandfather's possessions that their father would have done had he been alive.

Upon pretexts just as strange, and often more frivolous than these, duels continued to be fought in most of the countries of Europe during the whole of the fourteenth and fifteenth centuries. A memorable instance of the slightness of the pretext on which a man could be forced to fight a duel to the death, occurs in the Memoirs of the brave Constable, Du Guesclin. The advantage he had obtained, in a skirmish before Rennes, against William Brembre, an English captain, so preyed on the spirits of William Troussel, the chosen friend and companion of the latter, that nothing would satisfy him but a mortal combat with the Constable. The Duke of Lancaster, to whom Troussel applied for permission to fight the great Frenchman, forbade the battle, as not warranted by the circumstances. Troussel nevertheless burned with a fierce desire to cross his weapon with Du Guesclin, and sought every occasion to pick a quarrel with him. Having so good a will for it, of course he found a way. A relative of his had been taken prisoner by the Constable, in whose hands he remained till he was able to pay his ransom. Troussel resolved to make a quarrel out of this, and despatched a messenger to Du Guesclin, demanding the release of his prisoner, and offering a bond, at a distant date, for the payment of the ransom. Du Guesclin, who had received intimation of the hostile purposes of the Englishman, sent back word that he would not accept his bond, neither would he release his prisoner until the full amount of his ransom was paid. As soon as this answer was received, Troussel sent a challenge to the Constable, demanding reparation for the injury he had done his honour, by refusing his bond, and offering a mortal combat, to be fought three strokes with the lance, three with the sword, and three with the dagger. Du Guesclin, although ill in bed with the ague, accepted the

challenge, and gave notice to the Marshal d'Andreghem, the king's lieutenant-general in Lower Normandy, that he might fix the day and the place of combat. The marshal made all necessary arrangements, upon condition that he who was beaten should pay a hundred florins of gold to feast the nobles and gentlemen who were witnesses of the encounter.

The Duke of Lancaster was very angry with his captain, and told him that it would be a shame to his knighthood and his nation if he forced on a combat with the brave Du Guesclin at a time when he was enfeebled by disease and stretched on the couch of suffering. Upon these representations, Troussel, ashamed of himself, sent notice to Du Guesclin that he was willing to postpone the duel until such time as he should be perfectly recovered. Du Guesclin replied, that he could not think of postponing the combat after all the nobility had received notice of it; that he had sufficient strength left not only to meet, but to conquer such an opponent as he was; and that if he did not make his appearance in the lists at the time appointed, he would publish him every where as a man unworthy to be called a knight, or to wear an honourable sword by his side. Troussel carried this haughty message to the Duke of Lancaster, who immediately gave permission for the battle.

On the day appointed, the two combatants appeared in the lists, in the presence of several thousand spectators. Du Guesclin was attended by the flower of the French nobility, including the Marshal de Beaumanoir, Olivier de Mauny, Bertrand de Saint Pern, and the Viscount de la Bellière; while the Englishman appeared with no more than the customary retinue of two seconds, two squires, two coutilliers or daggermen, and two trumpeters. The first onset was unfavourable to the Constable. He received so heavy a blow on his shield-arm, that he fell forward to the left upon his horse's neck; and being weakened by his fever, was nearly thrown to the ground. All his friends thought he could never recover himself, and began to deplore his ill fortune; but Du Guesclin collected his energies for a decisive effort, and at the second charge aimed a blow at the shoulder of his

enemy, which felled him to the earth, mortally wounded. He then sprang from his horse, sword in hand, with the intention of cutting off the head of his fallen foe, when the Marshal d'Andreghem threw a golden wand into the arena as a signal that hostilities should cease. Du Guesclin was proclaimed the victor amid the joyous acclamations of the crowd, and retiring, left the field to the meaner combatants, who were afterwards to make sport for the people. Four English and as many French squires fought for some time with pointless lances, when the French gaining the advantage, the sports were declared at an end.

In the time of Charles VI., about the beginning of the fifteenth century, a famous duel was ordered by the parliament of Paris. The Sieur de Carrouges being absent in the Holy Land, his lady was violated by the Sieur Legris. Carrouges, on his return, challenged Legris to mortal combat for the twofold crime of violation and slander, inasmuch as he had denied his guilt by asserting that the lady was a willing party. The lady's asseverations of innocence were held to be no evidence by the parliament, and the duel was commanded, with all the ceremonies. "On the day appointed," says Brantôme,⁵⁸ "the lady came to witness the spectacle in her chariot; but the king made her descend, judging her unworthy, because she was criminal in his eyes till her innocence was proved, and caused her to stand upon a scaffold to await the mercy of God and this judgment by the battle. After a short struggle, the Sieur de Carrouges overthrew his enemy, and made him confess both the rape and the slander. He was then taken to the gallows and hanged in the presence of the multitude; while the innocence of the lady was proclaimed by the heralds, and recognised by her husband, the king, and all the spectators."

Numerous battles of a similar description constantly took place, until the unfortunate issue of one encounter of the kind led the French king, Henry II., to declare solemnly that he would never again permit any such encounter, whether it related to a civil or criminal case, or the honour of a gentleman.

This memorable combat was fought in the year 1547. François de Vivonne, lord of La Chataigneraie, and Guy de Chabot, lord of Jarnac, had been friends from their early youth, and were noted at the court of Francis I. for the gallantry of their bearing and the magnificence of their retinue. Chataigneraie, who knew that his friend's means were not very ample, asked him one day in confidence how it was that he contrived to be so well provided? Jarnac replied, that his father had married a young and beautiful woman, who, loving the son far better than the sire, supplied him with as much money as he desired. La Chataigneraie betrayed the base secret to the dauphin, the dauphin to the king, the king to his courtiers, and the courtiers to all their acquaintance. In a short time it reached the ears of the old Lord de Jarnac, who immediately sent for his son, and demanded to know in what manner the report had originated, and whether he had been vile enough not only to carry on such a connexion, but to boast of it? De Jarnac indignantly denied that he had ever said so, or given reason to the world to say so, and requested his father to accompany him to court and confront him with his accuser, that he might see the manner in which he would confound him. They went accordingly; and the younger De Jarnac, entering a room where the dauphin, La Chataigneraie, and several courtiers were present, exclaimed aloud, "That whoever had asserted that he maintained a criminal connexion with his mother-in-law was a liar and a coward!" Every eye was turned to the dauphin and La Chataigneraie, when the latter stood forward and asserted, that De Jarnac had himself avowed that such was the fact, and he would extort from his lips another confession of it. A case like this could not be met or rebutted by any legal proof, and the royal council ordered that it should be decided by single combat. The king, however, set his face against the duel,⁵⁹ and forbade them both, under pain of his high displeasure, to proceed any further in the matter. But Francis died in the following year, and the dauphin, now Henry II., who was himself compromised, resolved that the combat should take place.

The lists were prepared in the court-yard of the chateau of St. Germain-en-Laye, and the 10th of July, 1547, was appointed for the encounter. The cartels of the combatants, which are preserved in the *Mémoires de Castelnau*, were as follow:

“Cartel of François de Vivonne, lord of la Chataigneraie.

“SIRE,

“Having learned that Guy Chabot de Jarnac, being lately at Compiègne, asserted that whoever had said that he boasted of having criminal intercourse with his mother-in-law was wicked and a wretch, I, sire, with your good will and pleasure, do answer that he has wickedly lied, and will lie as many times as he denies having said that which I affirm he did say; for I repeat, that he told me several times, and boasted of it, that he had slept with his mother-in-law.

“FRANÇOIS DE VIVONNE.”

To this cartel De Jarnac replied:

“SIRE,

“With your good will and permission, I say, that François de Vivonne has lied in the imputation which he has cast upon me, and of which I spoke to you at Compiègne. I therefore entreat you, sire, most humbly, that you be pleased to grant us a fair field, that we may fight this battle to the death.

“GUY CHABOT.”

The preparations were conducted on a scale of the greatest magnificence, the king having intimated his intention of being present. La Chataigneraie made sure of the victory, and invited the king and a hundred and fifty of the principal personages of the court to sup with him in the evening, after

the battle, in a splendid tent which he had prepared at the extremity of the lists. De Jarnac was not so confident, though perhaps more desperate. At noon, on the day appointed, the combatants met, and each took the customary oath that he bore no charms or amulets about him, or made use of any magic, to aid him against his antagonist. They then attacked each other, sword in hand. La Chataigneraie was a strong robust man, and over confident; De Jarnac was nimble, supple, and prepared for the worst. The combat lasted for some time doubtful, until De Jarnac, overpowered by the heavy blows of his opponent, covered his head with his shield, and, stooping down, endeavoured to make amends by his agility for his deficiency of strength. In this crouching posture he aimed two blows at the left thigh of La Chataigneraie, who had left it uncovered, that the motion of his leg might not be impeded. Each blow was successful, and, amid the astonishment of all the spectators, and to the great regret of the king, La Chataigneraie rolled over upon the sand. He seized his dagger, and made a last effort to strike De Jarnac: but he was unable to support himself, and fell powerless into the arms of the assistants. The officers now interfered, and De Jarnac being declared the victor, fell down upon his knees, uncovered his head, and, clasping his hands together, exclaimed: “*O Domine, non sum dignus!*” La Chataigneraie was so mortified by the result of the encounter, that he resolutely refused to have his wounds dressed. He tore off the bandages which the surgeons applied, and expired two days afterwards. Ever since that time, any sly and unforeseen attack has been called by the French a *coup de Jarnac*. Henry was so grieved at the loss of his favourite, that he made the solemn oath already alluded to, that he would never again, so long as he lived, permit a duel. Some writers have asserted, and among others, Mezerai, that he issued a royal edict forbidding them. This has been doubted by others, and as there appears no registry of the edict in any of the courts, it seems most probable that it was never issued. This opinion is strengthened by the fact, that, two years afterwards, the council ordered another duel to be fought with similar

forms, but with less magnificence, on account of the inferior rank of the combatants. It is not anywhere stated that Henry interfered to prevent it, notwithstanding his solemn oath; but that, on the contrary, he encouraged it, and appointed the Marshal de la Marque to see that it was conducted according to the rules of chivalry. The disputants were Fendille and D'Aguerre, two gentlemen of the household, who, quarrelling in the king's chamber, had proceeded from words to blows. The council, being informed of the matter, decreed that it could only be decided in the lists. Marshal de la Marque, with the king's permission, appointed the city of Sedan as the place of combat. Fendille, who was a bad swordsman, was anxious to avoid an encounter with D'Aguerre, who was one of the most expert men of the age; but the council authoritatively commanded that he should fight, or be degraded from all his honours. D'Aguerre appeared in the field attended by François de Vendôme, Count de Chartres, while Fendille was accompanied by the Duke of Nevers. Fendille appears to have been not only an inexpert swordsman, but a thorough coward; one who, like Cowley, might have heaped curses on the man,

“(Death's factor sure), who brought
Dire swords into this peaceful world.”

On the very first encounter he was thrown from his horse, and, confessing on the ground all that his victor required of him, slunk away ignominiously from the arena.

One is tempted to look upon the death of Henry II. as a judgment upon him for his perjury in the matter of duelling. In a grand tournament instituted on the occasion of the marriage of his daughter, he broke several lances in encounters with some of the bravest knights of the time. Ambitious of still further renown, he would not rest satisfied until he had also engaged the young Count de Montgomeri. He received a wound in

the eye from the lance of his antagonist, and died from its effects shortly afterwards, in the forty-first year of his age.

In the succeeding reigns of Francis II., Charles IX., and Henry III., the practice of duelling increased to an alarming extent. Duels were not rare in the other countries of Europe at the same period; but in France they were so frequent, that historians, in speaking of that age, designate it as “l’époque de la fureur des duels.” The parliament of Paris endeavoured, as far as in its power lay, to discourage the practice. By a decree dated the 26th of June 1559, it declared all persons who should be present at duels, or aiding and abetting in them, to be rebels to the king, transgressors of the law, and disturbers of the public peace.

When Henry III. was assassinated at St. Cloud in 1589, a young gentleman, named L’Isle-Marivaut, who had been much beloved by him, took his death so much to heart, that he resolved not to survive him. Not thinking suicide an honourable death, and wishing, as he said, to die gloriously in revenging his king and master, he publicly expressed his readiness to fight any body to the death, who should assert that Henry’s assassination was not a great misfortune to the community. Another youth, of a fiery temper and tried courage, named Marolles, took him at his word, and the day and place of the combat were forthwith appointed. When the hour had come, and all were ready, Marolles turned to his second, and asked whether his opponent had a casque or helmet only, or whether he wore a *sallade*, or headpiece. Being answered a helmet only, he said gaily, “So much the better; for, sir my second, you shall repute me the wickedest man in all the world, if I do not thrust my lance right through the middle of his head and kill him.” Truth to say, he did so at the very first onset, and the unhappy L’Isle-Marivaut expired without a groan. Brantôme, who relates this story, adds, that the victor might have done as he pleased with the body, cut off the head, dragged it out of the camp, or exposed it upon an ass; but that being a wise and very courteous gentleman, he left it to the relatives of the deceased to be honourably buried, contenting himself with

the glory of his triumph, by which he gained no little renown and honour among the ladies of Paris.



HENRY IV.

On the accession of Henry IV. that monarch determined to set his face against duelling; but such was the influence of early education and the prejudices of society upon him, that he never could find it in his heart to punish a man for this offence. He thought it tended to foster a warlike spirit among his people. When the chivalrous Créqui demanded his permission to fight Don Philippe de Savoie, he is reported to have said, "Go, and if I were not a king, I would be your second." It is no wonder that when such was known to be the king's disposition, his edicts attracted but small attention. A calculation was made by M. de Lomenie, in the year 1607, that since the accession of Henry, in 1589, no less than four thousand French gentlemen had lost their lives in these conflicts; which, for the eighteen years, would have been at the rate of four or five in a week, or eighteen per month! Sully, who reports this fact in his Memoirs, does not throw the slightest doubt upon its exactness; and adds, that it was chiefly owing to the facility and ill-advised good-nature of his royal master that the bad example had so empoisoned the court, the city, and the whole country. This wise minister devoted much of his time and attention to the subject; for the rage, he says, was such as to cause him a thousand pangs, and the king also. There was hardly a man moving in what was called good society, who had not been engaged in a duel either as principal or second; and if there were such a man, his chief desire was to free himself from the imputation of non-duelling, by picking a quarrel with somebody. Sully

constantly wrote letters to the king, in which he prayed him to renew the edicts against this barbarous custom, to aggravate the punishment against offenders, and never, in any instance, to grant a pardon, even to a person who had wounded another in a duel, much less to any one who had taken away life. He also advised, that some sort of tribunal, or court of honour, should be established, to take cognisance of injurious and slanderous language, and of all such matters as usually led to duels; and that the justice to be administered by this court should be sufficiently prompt and severe to appease the complainant, and make the offender repent of his aggression.



GALLERY AT FONTAINEBLEAU.

Henry, being so warmly pressed by his friend and minister, called together an extraordinary council in the gallery of the palace of Fontainebleau, to take the matter into consideration. When all the members were assembled, his majesty requested that some person conversant with the subject would make a report to him on the origin, progress, and different forms of the duel. Sully complacently remarks, that none of the councillors gave the king any great reason to felicitate them on their erudition. In fact, they all remained silent. Sully held his peace with the rest; but he looked so knowing, that the king turned towards him, and said:—“Great master! by your face I conjecture that you know more of this matter than you would have us believe. I pray you, and indeed I command, that you tell us what you think and what you know.” The coy minister

refused, as he says, out of mere politeness to his more ignorant colleagues; but, being again pressed by the king, he entered into a history of duelling both in ancient and modern times. He has not preserved this history in his Memoirs; and, as none of the ministers or councillors present thought proper to do so, the world is deprived of a discourse which was, no doubt, a learned and remarkable one. The result was, that a royal edict was issued, which Sully lost no time in transmitting to the most distant provinces, with a distinct notification to all parties concerned that the king was in earnest, and would exert the full rigour of the law in punishment of the offenders. Sully himself does not inform us what were the provisions of the new law; but Father Matthias has been more explicit, and from him we learn, that the marshals of France were created judges of a court of chivalry, for the hearing of all causes wherein the honour of a noble or gentleman was concerned, and that such as resorted to duelling should be punished by death and confiscation of property, and that the seconds and assistants should lose their rank, dignity, or offices, and be banished from the court of their sovereign.⁶⁰

But so strong a hold had the education and prejudice of his age upon the mind of the king, that though his reason condemned, his sympathies approved the duel. Notwithstanding this threatened severity, the number of duels did not diminish, and the wise Sully had still to lament the prevalence of an evil which menaced society with utter disorganisation. In the succeeding reign the practice prevailed, if possible, to a still greater extent, until the Cardinal de Richelieu, better able to grapple with it than Sully had been, made some severe examples in the very highest classes. Lord Herbert, the English ambassador at the court of Louis XIII., repeats, in his letters, an observation that had been previously made in the reign of Henry IV., that it was rare to find a Frenchman moving in good society who had not killed his man in a duel. The Abbé Millot says of this period, that the duel madness made the most terrible ravages. Men had actually a frenzy for combating. Caprice and vanity, as well as the excitement of

passion, imposed the necessity of fighting. Friends were obliged to enter into the quarrels of their friends, or be themselves called out for their refusal, and revenge became hereditary in many families. It was reckoned that in twenty years eight thousand letters of pardon had been issued to persons who had killed others in single combat.⁶¹

Other writers confirm this statement. Amelot de Houssaye, in his Memoirs, says, upon this subject, that duels were so common in the first years of the reign of Louis XIII., that the ordinary conversation of persons when they met in the morning was, "*Do you know who fought yesterday?*" and after dinner, "*Do you know who fought this morning?*" The most infamous duellist at that period was De Bouteville. It was not at all necessary to quarrel with this assassin, to be forced to fight a duel with him. When he heard that any one was very brave, he would go to him, and say, "*People tell me that you are brave; you and I must fight together!*" Every morning the most notorious bravos and duellists used to assemble at his house, to take a breakfast of bread and wine, and practise fencing. M. de Valençay, who was afterwards elevated to the rank of a cardinal, stood very high in the estimation of De Bouteville and his gang. Hardly a day passed but what he was engaged in some duel or other, either as principal or second; and he once challenged De Bouteville himself, his best friend, because De Bouteville had fought a duel without inviting him to become his second. This quarrel was only appeased on the promise of De Bouteville that, in his next encounter, he would not fail to avail himself of his services. For that purpose he went out the same day, and picked a quarrel with the Marquis des Portes. M. de Valençay, according to agreement, had the pleasure of serving as his second, and of running through the body M. de Cavois, the second of the Marquis des Portes, a man who had never done him any injury, and whom he afterwards acknowledged he had never seen before.

Cardinal Richelieu devoted much attention to this lamentable state of public morals, and seems to have concurred with his great predecessor

Sully, that nothing but the most rigorous severity could put a stop to the evil. The subject indeed was painfully forced upon him by his enemies. The Marquis de Themines, to whom Richelieu, then Bishop of Luçon, had given offence by some representations he had made to Mary of Medicis, determined, since he could not challenge an ecclesiastic, to challenge his brother. An opportunity was soon found. Themines, accosting the Marquis de Richelieu, complained, in an insulting tone, that the Bishop of Luçon had broken his faith. The Marquis resented both the manner and matter of his speech, and readily accepted a challenge. They met in the Rue d'Angoulême, and the unfortunate Richelieu was stabbed to the heart, and instantly expired. From that moment the bishop became the steady foe of the practice of duelling. Reason and the impulse of brotherly love alike combined to make him detest it, and when his power in France was firmly established, he set vigorously about repressing it. In his *Testament Politique*, he has collected his thoughts upon the subject, in the chapter entitled "Des moyens d'arrêter les Duels." In spite of the edicts that he published, the members of the nobility persisted in fighting upon the most trivial and absurd pretences. At last Richelieu made a terrible example. The infamous De Bouteville challenged and fought the Marquis de Beuvron; and although the duel itself was not fatal to either, its consequences were fatal to both. High as they were, Richelieu resolved that the law should reach them both, and they were both tried, found guilty, and beheaded. Thus did society get rid of one of the most bloodthirsty scoundrels that ever polluted it.



SULLY.

In 1632 two noblemen fought a duel in which they were both killed. The officers of justice had notice of the breach of the law, and arrived at the scene of combat before the friends of the parties had time to remove the bodies. In conformity with the cardinal's severe code upon the subject, the bodies were ignominiously stripped and hanged upon a gallows with their heads downwards, for several hours, within sight of all the people.⁶² This severity sobered the frenzy of the nation for a time; but it was soon forgotten. Men's minds were too deeply imbued with a false notion of honour to be brought to a right way of thinking: by such examples, however striking, Richelieu was unable to persuade them to walk in the right path, though he could punish them for choosing the wrong one. He had with all his acuteness, miscalculated the spirit of duelling. It was not death that a duellist feared; it was shame, and the contempt of his fellows. As Addison remarked more than eighty years afterwards,

“Death was not sufficient to deter men who made it their glory to despise it; but if every one who fought a duel were to stand in the pillory, it would quickly diminish the number of those imaginary men of honour, and put an end to so absurd a practice.” Richelieu never thought of this.

Sully says, that in his time the Germans were also much addicted to duelling. There were three places where it was legal to fight; Witzburg in Franconia, and Uspach and Halle in Swabia. Thither of course, vast numbers repaired, and murdered each other under sanction of the law. At an earlier period in Germany, it was held highly disgraceful to refuse to fight. Any one who surrendered to his adversary for a simple wound that did not disable him, was reputed infamous, and could neither cut his beard, bear arms, mount on horseback, or hold any office in the state. He who fell in a duel was buried with great pomp and splendour.

In the year 1652, just after Louis XIV. had attained his majority, a desperate duel was fought between the Dukes de Beaufort and De Nemours, each attended by four gentlemen. Although brothers-in-law, they had long been enemies, and their constant dissensions had introduced much disorganisation among the troops which they severally commanded. Each had long sought an opportunity for combat, which at last arose on a misunderstanding relative to the places they were to occupy at the council-board. They fought with pistols, and, at the first discharge, the Duke de Nemours was shot through the body, and almost instantly expired. Upon this the Marquis de Villars, who seconded Nemours, challenged Héricourt, the second of the Duke de Beaufort, a man whom he had never before seen; and the challenge being accepted, they fought even more

desperately than their principals. This combat, being with swords, lasted longer than the first, and was more exciting to the six remaining gentlemen who stayed to witness it. The result was fatal to Héricourt, who fell pierced to the heart by the sword of De Villars. Any thing more savage than this can hardly be imagined. Voltaire says such duels were frequent, and the compiler of the *Dictionnaire d'Anecdotes* informs us that the number of seconds was not fixed. As many as ten, or twelve, or twenty, were not unfrequent, and they often fought together after their principals were disabled. The highest mark of friendship one man could manifest towards another, was to choose him for his second; and many gentlemen were so desirous of serving in this capacity, that they endeavoured to raise every slight misunderstanding into a quarrel, that they might have the pleasure of being engaged in it. The Count de Bussy-Rabutin relates an instance of this in his Memoirs. He says, that as he was one evening coming out of the theatre, a gentleman named Bruc, whom he had not before known, stopped him very politely, and, drawing him aside, asked him if it was true that the Count de Thianges had called him (Bruc) a drunkard? Bussy replied that he really did not know, for he saw the count very seldom. "Oh, he is your uncle!" replied Bruc; "and, as I cannot have satisfaction from him, because he lives so far off in the country, I apply to you." "I see what you are at," replied Bussy, "and, since you wish to put me in my uncle's place, I answer, that whoever asserted that he called you a drunkard, told a lie!" "My brother said so," replied Bruc, "and he is a child." "Horsewhip him, then, for his falsehood," returned De Bussy. "I will not have my brother called, a liar," returned Bruc, determined to quarrel with him; "so draw, and defend yourself!" They both drew

their swords in the public street, but were separated by the spectators. They agreed, however, to fight on a future occasion, and with all the regular forms of the duello. A few days afterwards, a gentleman, whom De Bussy had never before seen, and whom he did not know even by name, called upon him and asked if he might have the privilege of serving as his second. He added, that he neither knew him nor Bruc, except by reputation, but having made up his mind to be second of one of them, he had decided upon accompanying De Bussy as the braver man of the two. De Bussy thanked him very sincerely for his politeness, but begged to be excused, as he had already engaged four seconds to accompany him, and he was afraid that if he took any more the affair would become a battle instead of a duel.

When such quarrels as these were looked upon as mere matters of course, the state of society must have been indeed awful. Louis XIV. very early saw the evil, and as early determined to remedy it. It was not, however, till the year 1679, when he instituted the “Chambre Ardente,” for the trial of the slow poisoners and pretenders to sorcery, that he published any edict against duelling. In that year his famous edict was promulgated, in which he reiterated and confirmed the severe enactments of his predecessors Henry IV. and Louis XIII., and expressed his determination never to pardon any offender. By this celebrated ordinance a supreme court of honour was established, composed of the marshals of France. They were bound, on taking the office, to give to every one who brought a well-founded complaint before them, such reparation as would satisfy the justice of the case. Should any gentleman against whom complaint was made refuse to obey the mandate of the court of honour, he might be punished by

fine and imprisonment; and when that was not possible, by reason of his absenting himself from the kingdom, his estates might be confiscated till his return.

Every man who sent a challenge, be the cause of offence what it might, was deprived of all redress from the court of honour—suspended three years from the exercise of any office in the state—was further imprisoned for two years, and sentenced to pay a fine of half his yearly income.

He who accepted a challenge was subject to the same punishment. Any servant or other person, who knowingly became the bearer of a challenge, was, if found guilty, sentenced to stand in the pillory and be publicly whipped for the first offence; and for the second, sent for three years to the galleys.

Any person who actually fought, was to be held guilty of murder, even though death did not ensue, and was to be punished accordingly. Persons in the higher ranks of life were to be beheaded, and those of the middle class hanged upon a gallows, and their bodies refused Christian burial.

At the same time that Louis published this severe edict, he exacted a promise from his principal nobility that they would never engage in a duel on any pretence whatever. He never swerved from his resolution to pursue all duellists with the utmost rigour, and many were executed in various parts of the country. A slight abatement of the evil was the consequence, and in the course of a few years one duel was not fought where twelve had been fought previously. A medal was struck to commemorate the circumstance, by the express command of the king. So much had he this object at heart, that, in his will, he particularly recommended to his successor the care of his

edict against duelling, and warned him against any ill-judged lenity to those who disobeyed it.

A singular law formerly existed in Malta with regard to duelling. By this law it was permitted, but only upon condition that the parties should fight in one particular street. If they presumed to settle their quarrel elsewhere, they were held guilty of murder, and punished accordingly. What was also very singular, they were bound, under heavy penalties, to put up their swords when requested to do so by a priest, a knight, or a woman. It does not appear, however, that the ladies or the knights exercised this mild and beneficent privilege to any great extent; the former were too often themselves the cause of duels, and the latter sympathised too much in the wounded honour of the combatants to attempt to separate them. The priests alone were the great peacemakers. Brydone says, that a cross was always painted on the wall opposite to the spot where a knight had been killed, and that in the "street of duels" he counted about twenty of them.⁶³

In England the private duel was also practised to a scandalous extent, towards the end of the sixteenth and beginning of the seventeenth centuries. The judicial combat now began to be more rare, but several instances of it are mentioned in history. One was instituted in the reign of Elizabeth, and another so late as the time of Charles I. Sir Henry Spelman gives an account of that which took place in Elizabeth's reign, which is curious, perhaps the more so when we consider that it was perfectly legal, and that similar combats remained so till the year 1819. A proceeding having been instituted in the Court of Common Pleas for the recovery of certain manorial rights in the county of Kent, the defendant offered to prove

by single combat his right to retain possession. The plaintiff accepted the challenge, and the Court having no power to stay the proceedings, agreed to the champions who were to fight in lieu of the principals. The queen commanded the parties to compromise; but it being represented to her majesty that they were justified by law in the course they were pursuing, she allowed them to proceed. On the day appointed, the justices of the Common Pleas, and all the counsel engaged in the cause, appeared as umpires of the combat, at a place in Tothill-fields, where the lists had been prepared. The champions were ready for the encounter, and the plaintiff and defendant were publicly called to come forward and acknowledge them. The defendant answered to his name, and recognised his champion with the due formalities, but the plaintiff did not appear. Without his presence and authority the combat could not take place; and his absence being considered an abandonment of his claim, he was declared to be non-suited, and barred for ever from renewing his suit before any other tribunal whatever.



LORD BACON.

The queen appears to have disapproved personally of this mode of settling a disputed claim, but her judges and legal advisers made no attempt to alter the barbarous law. The practice of private duelling excited more indignation, from its being of every-day occurrence. In the time of James I. the English were so infected with the French

madness, that Bacon, when he was attorney-general, lent the aid of his powerful eloquence to effect a reformation of the evil. Informations were exhibited in the Star Chamber against two persons, named Priest and Wright, for being engaged, as principal and second, in a duel, on which occasion he delivered a charge that was so highly approved of by the Lords of the Council, that they ordered it to be printed and circulated over the country, as a thing “very meet and worthy to be remembered and made known unto the world.” He began by considering the nature and greatness of the mischief of duelling. “It troubleth peace—it disfurnisheth war—it bringeth calamity upon private men, peril upon the state, and contempt upon the law. Touching the cause of it,” he observed, “that the first motive of it, no doubt, is a false and erroneous imagination of honour and credit; but then, the seed of this mischief being such, it is nourished by vain discourses and green and unripe conceits. Hereunto may be added, that men have almost lost the true notion and understanding of fortitude and valour. For fortitude distinguisheth of the grounds of quarrel whether they be just; and not only so, but whether they be worthy, and setteth a better price upon men’s lives than to bestow them idly. Nay, it is weakness and disesteem of a man’s self to put a man’s life upon such liedger performances. A man’s life is not to be trifled with; it is to be offered up and sacrificed to honourable services, public merits, good causes, and noble adventures. It is in expense of blood as it is in expense of money. It is no liberality to make a profusion of money upon every vain occasion, neither is it fortitude to make effusion of blood, except the cause of it be worth.”⁶⁴

The most remarkable event connected with duelling in this reign was that between Lord Sanquir, a Scotch nobleman, and one Turner, a fencing-master. In a trial of skill between them, his lordship's eye was accidentally thrust out by the point of Turner's sword. Turner expressed great regret at the circumstance, and Lord Sanquir bore his loss with as much philosophy as he was master of, and forgave his antagonist. Three years afterwards, Lord Sanquir was at Paris, where he was a constant visitor at the court of Henry IV. One day, in the course of conversation, the affable monarch inquired how he had lost his eye. Sanquir, who prided himself on being the most expert swordsman of the age, blushed as he replied that it was inflicted by the sword of a fencing-master. Henry, forgetting his assumed character of an anti-duellist, carelessly, and as a mere matter of course, inquired whether the man lived? Nothing more was said; but the query sank deep into the proud heart of the Scotch baron, who returned shortly afterwards to England, burning for revenge. His first intent was to challenge the fencing-master to single combat; but, on further consideration, he deemed it inconsistent with his dignity to meet him as an equal in fair and open fight. He therefore hired two bravos, who set upon the fencing-master, and murdered him in his own house at Whitefriars. The assassins were taken and executed, and a reward of one thousand pounds offered for the apprehension of their employer. Lord Sanquir concealed himself for several days, and then surrendered to take his trial, in the hope (happily false) that Justice would belie her name, and be lenient to a murderer because he was a nobleman, who on a false point of honour had thought fit to take revenge into his own hands. The most powerful intercessions were employed in his favour, but James, to his credit, was deaf to

them all. Bacon, in his character of attorney-general, prosecuted the prisoner to conviction; and he died the felon's death on the 29th of June, 1612, on a gibbet erected in front of the gate of Westminster Hall.

With regard to the public duel, or trial by battle, demanded under the sanction of the law, to terminate a quarrel which the ordinary course of justice could with difficulty decide, Bacon was equally opposed to it, and thought that in no case should it be granted. He suggested that there should be declared a constant and settled resolution in the state to abolish it altogether; that care should be taken that the evil be no more cockered, nor the humour of it fed, but that all persons found guilty should be rigorously punished by the Star Chamber, and those of eminent quality banished from the court.

In the succeeding reign, when Donald Mackay, the first Lord Reay, accused David Ramsay of treason, in being concerned with the Marquis of Hamilton in a design upon the crown of Scotland, he was challenged by the latter to make good his assertion by single combat.⁶⁵ It had been at first the intention of the government to try the case by the common law, but Ramsay thought he would stand a better chance of escape by recurring to the old and almost exploded custom, but which was still the right of every man in appeals of treason. Lord Reay readily accepted the challenge, and both were confined in the Tower until they found security that they would appear on a certain day appointed by the court to determine the question. The management of the affair was delegated to the Marischal Court of Westminster, and the Earl of Lindsay was created Lord Constable of England for the purpose. Shortly before the day appointed, Ramsay confessed in substance all that Lord Reay had

laid to his charge, upon which Charles I. put a stop to the proceedings.

But in England, about this period, sterner disputes arose among men than those mere individual matters which generate duels. The men of the Commonwealth encouraged no practice of the kind, and the subdued aristocracy carried their habits and prejudices elsewhere, and fought their duels at foreign courts. Cromwell's parliament, however—although the evil at that time was not so crying—published an order in 1654 for the prevention of duels, and the punishment of all concerned in them. Charles II., on his restoration, also issued a proclamation upon the subject. In his reign an infamous duel was fought—infamous not only from its own circumstances, but from the lenity that was shewn to the principal offenders.

The worthless Duke of Buckingham, having debauched the Countess of Shrewsbury, was challenged by her husband to mortal combat in January 1668. Charles II. endeavoured to prevent the duel, not from any regard to public morality, but from fear for the life of his favourite. He gave commands to the Duke of Albemarle to confine Buckingham to his house, or take some other measures to prevent him from fighting. Albemarle neglected the order, thinking that the king himself might prevent the combat by some surer means. The meeting took place at Barn Elms; the injured Shrewsbury being attended by Sir John Talbot, his relative, and Lord Bernard Howard, son of the Earl of Arundel. Buckingham was accompanied by two of his dependents, Captain Holmes and Sir John Jenkins. According to the barbarous custom of the age, not only the principals, but the seconds engaged each other. Jenkins was pierced to the heart, and left dead upon the field, and Sir John Talbot

severely wounded in both arms. Buckingham himself escaping with slight wounds, ran his unfortunate antagonist through the body, and then left the field with the wretched woman, the cause of all the mischief, who, in the dress of a page, awaited the issue of the conflict in a neighbouring wood, holding her paramour's horse to avoid suspicion. Great influence was exerted to save the guilty parties from punishment, and the master, as base as the favourite, made little difficulty in granting a free pardon to all concerned. In a royal proclamation issued shortly afterwards, Charles II. formally pardoned the murderers, but declared his intention never to extend in future any mercy to such offenders. It would be hard, after this, to say who was the most infamous, the king, the favourite, or the courtesan.

In the reign of Queen Anne, repeated complaints were made of the prevalence of duelling. Addison, Swift, Steele, and other writers employed their powerful pens in reprobation of it. Steele especially, in the *Tatler* and *Guardian*, exposed its impiety and absurdity, and endeavoured both by argument and by ridicule to bring his countrymen to a right way of thinking.⁶⁶ His comedy of *The Conscious Lovers* contains an admirable exposure of the abuse of the word *honour*, which led men into an error so lamentable. Swift, writing upon the subject, remarked that he could see no harm in rogues and fools shooting each other. Addison and Steele took higher ground; and the latter, in the *Guardian*, summed up nearly all that could be said upon the subject in the following impressive words:—“A Christian and a gentleman are made inconsistent appellations of the same person. You are not to expect eternal life if you do not forgive injuries, and your mortal life is rendered uncomfortable if

you are not ready to commit a murder in resentment of an affront; for good sense, as well as religion, is so utterly banished the world, that men glory in their very passions, and pursue trifles with the utmost vengeance, so little do they know that to forgive is the most arduous pitch human nature can arrive at. A coward has often fought, a coward has often conquered; but a coward never forgave.” Steele also published a pamphlet, in which he gave a detailed account of the edict of Louis XIV., and the measures taken by that monarch to cure his subjects of their murderous folly.

On the 8th of May, 1711, Sir Cholmely Deering, M.P. for the county of Kent, was slain in a duel by Mr. Richard Thornhill, also a member of the House of Commons. Three days afterwards, Sir Peter King brought the subject under the notice of the legislature; and after dwelling at considerable length on the alarming increase of the practice, obtained leave to bring in a bill for the prevention and punishment of duelling. It was read a first time that day, and ordered for a second reading in the ensuing week.

About the same time, the attention of the Upper House of Parliament was also drawn to the subject in the most painful manner. Two of its most noted members would have fought had it not been that Queen Anne received notice of their intention, and exacted a pledge that they would desist; while a few months afterwards two other of its members lost their lives in one of the most remarkable duels upon record. The first affair, which happily terminated without a meeting, was between the Duke of Marlborough and the Earl Pawlet; the latter and fatal encounter was between the Duke of Hamilton and Lord Mohun.

The first arose out of a debate in the Lords upon the conduct of the Duke of Ormond in refusing to hazard a general engagement with the enemy, in which Earl Pawlet remarked that nobody could doubt the courage of the Duke of Ormond. "He was not like a certain general, who led troops to the slaughter, to cause great numbers of officers to be knocked on the head in a battle, or against stone walls, in order to fill his pockets by disposing of their commissions." Every one felt that the remark was aimed at the Duke of Marlborough, but he remained silent, though evidently suffering in mind. Soon after the House broke up, the Earl Pawlet received a visit from Lord Mohun, who told him that the Duke of Marlborough was anxious to come to an explanation with him relative to some expressions he had made use of in that day's debate, and therefore prayed him to "go and take a little air in the country." Earl Pawlet did not affect to misunderstand the hint, but asked him in plain terms whether he brought a challenge from the duke. Lord Mohun said his message needed no explanation, and that he [Lord Mohun] would accompany the Duke of Marlborough. He then took his leave, and Earl Pawlet returned home and told his lady that he was going out to fight a duel with the Duke of Marlborough. His lady, alarmed for her lord's safety, gave notice of his intention to the Earl of Dartmouth, who immediately, in the queen's name, sent to the Duke of Marlborough, and commanded him not to stir abroad. He also caused Earl Pawlet's house to be guarded by two sentinels; and having taken these precautions, informed the queen of the whole affair. Her Majesty sent at once for the duke, expressed her abhorrence of the custom of duelling, and required his word of honour that he would proceed no

further. The duke pledged his word accordingly, and the affair terminated.

The lamentable duel between the Duke of Hamilton and Lord Mohun took place in November 1712, and sprang from the following circumstances. A lawsuit had been pending for eleven years between these two noblemen, and they looked upon each other in consequence with a certain degree of coldness. They met together on the 13th of November in the chambers of Mr. Orlebar, a master in Chancery, when, in the course of conversation, the Duke of Hamilton reflected upon the conduct of one of the witnesses in the cause, saying that he was a person who had neither truth nor justice in him. Lord Mohun, somewhat nettled at this remark applied to a witness favourable to his side, made answer hastily, that Mr. Whitworth, the person alluded to, had quite as much truth and justice in him as the Duke of Hamilton. The duke made no reply, and no one present imagined that he took offence at what was said; and when he went out of the room he made a low and courteous salute to the Lord Mohun. In the evening, General Macartney called twice upon the duke with a challenge from Lord Mohun, and failing in seeing him, sought him a third time at a tavern, where he found him, and delivered his message. The duke accepted the challenge, and the day after the morrow, which was Sunday, the 15th of November, at seven in the morning, was appointed for the meeting.

At that hour they assembled in Hyde Park, the duke being attended by his relative Colonel Hamilton, and the Lord Mohun by General Macartney. They jumped over a ditch into a place called the Nursery, and prepared for the combat. The Duke of Hamilton, turning to General Macartney, said, "*Sir, you are the cause of this,*

let the event be what it will.” Lord Mohun did not wish that the seconds should engage, but the duke insisted that “*Macartney should have a share in the dance.*” All being ready, the two principals took up their positions, and fought with swords so desperately, that after a short time they both fell down mortally wounded. The Lord Mohun expired upon the spot, and the Duke of Hamilton in the arms of his servants as they were carrying him to his coach.

This unhappy termination caused the greatest excitement not only in the metropolis, but all over the country. The Tories, grieved at the loss of the Duke of Hamilton, charged the fatal combat on the Whig party, whose leader, the Duke of Marlborough, had so recently set the example of political duels. They called Lord Mohun the bully of the Whig faction (he had already killed three men in duels, and been twice tried for murder), and asserted openly that the quarrel was concocted between him and General Macartney to rob the country of the services of the Duke of Hamilton by murdering him. It was also asserted that the wound of which the duke died was not inflicted by Lord Mohun, but by Macartney; and every means was used to propagate this belief. Colonel Hamilton, against whom and Macartney the coroner’s jury had returned a verdict of wilful murder, surrendered a few days afterwards, and was examined before a privy council sitting at the house of Lord Dartmouth. He then deposed, that seeing Lord Mohun fall, and the duke upon him, he ran to the duke’s assistance; and that he might with the more ease help him, he flung down both their swords, and as he was raising the duke up, *he saw Macartney make a push at him.* Upon this deposition, a royal proclamation was immediately issued, offering a reward of 500*l.* for

the apprehension of Macartney, to which the Duchess of Hamilton afterwards added a reward of 300*l*.

Upon the further examination of Colonel Hamilton, it was found that reliance could not be placed on all his statements, and that he contradicted himself in several important particulars. He was arraigned at the old Bailey for the murder of Lord Mohun, the whole political circles of London being in a fever of excitement for the result. All the Tory party prayed for his acquittal, and a Tory mob surrounded the doors and all the avenues leading to the court of justice for many hours before the trial began. The examination of witnesses lasted seven hours. The criminal still persisted in accusing General Macartney of the murder of the Duke of Hamilton, but in other respects, say the newspapers of the day, prevaricated foully. He was found guilty of manslaughter. This favourable verdict was received with universal applause, “not only from the court and all the gentlemen present, but the common people shewed a mighty satisfaction, which they testified by loud and repeated huzzas.”⁶⁷

As the popular delirium subsided, and men began to reason coolly upon the subject, they disbelieved the assertions of Colonel Hamilton that Macartney had stabbed the duke, although it was universally admitted that he had been much too busy and presuming. Hamilton was shunned by all his former companions, and his life rendered so irksome to him, that he sold out of the Guards and retired to private life, in which he died heart-broken four years afterwards.

General Macartney surrendered about the same time, and was tried for murder in the Court of King’s Bench. He was, however, found guilty of manslaughter only.

At the opening of the session of Parliament of 1713, the queen made pointed allusion in her speech to the frequency of duelling, and recommended to the legislature to devise some speedy and effectual remedy for it. A bill to that effect was brought forward, but thrown out on the second reading, to the very great regret of all the sensible portion of the community.

A famous duel was fought in 1765 between Lord Byron and Mr. Chaworth. The dispute arose at a club-dinner, and was relative to which of the two had the largest quantity of game on his estates. Infuriated by wine and passion, they retired instantly into an adjoining room, and fought with swords across a table, by the feeble glimmer of a tallow candle. Mr. Chaworth, who was the more expert swordsman of the two, received a mortal wound, and shortly afterwards expired. Lord Byron was brought to trial for the murder before the House of Lords; and it appearing clearly that the duel was not premeditated, but fought at once, and in the heat of passion, he was found guilty of manslaughter only, and ordered to be discharged upon payment of his fees. This was a very bad example for the country, and duelling of course fell into no disrepute after such a verdict.

In France more severity was exercised. In the year 1769, the Parliament of Grenoble took cognisance of the delinquency of the Sieur Duchelas, one of its members, who challenged and killed in a duel a captain of the Flemish legion. The servant of Duchelas officiated as second, and was arraigned with his master for the murder of the captain. They were both found guilty. Duchelas was broken alive on the wheel, and the servant condemned to the galleys for life.

A barbarous and fiercely-contested duel was fought in November 1778, between two foreign adventurers, at Bath, named Count Rice and the Vicomte du Barri. Some dispute arose relative to a gambling transaction, in the course of which Du Barri contradicted an assertion of the other, by saying "That is not true!" Count Rice immediately asked him if he knew the very disagreeable meaning of the words he had employed. Du Barri said he was perfectly well aware of their meaning, and that Rice might interpret them just as he pleased. A challenge was immediately given and accepted. Seconds were sent for, who, arriving with but little delay, the whole party, though it was not long after midnight, proceeded to a place called Claverton Down, where they remained with a surgeon until daylight. They then prepared for the encounter, each being armed with two pistols and a sword. The ground having been marked out by the seconds, Du Barri fired first, and wounded his opponent in the thigh. Count Rice then levelled his pistol, and shot Du Barri mortally in the breast. So angry were the combatants, that they refused to desist; both stepped back a few paces, and then rushing forward, discharged their second pistols at each other. Neither shot took effect, and both throwing away their pistols, prepared to finish the sanguinary struggle by the sword. They took their places, and were advancing towards each other, when the Vicomte du Barri suddenly staggered, grew pale, and, falling on the ground, exclaimed, "*Je vous demande ma vie.*" His opponent had but just time to answer, that he granted it, when the unfortunate Du Barri turned upon the grass, and expired with a heavy groan. The survivor of this savage conflict was then removed to his lodgings, where he lay for some weeks in a dangerous state. The coroner's jury, in the mean while, sat upon the body of Du

Barri, and disgraced themselves by returning a verdict of manslaughter only. Count Rice, upon his recovery, was indicted for the murder notwithstanding this verdict. On his trial he entered into a long defence of his conduct, pleading the fairness of the duel, and its unpremeditated nature; and, at the same time, expressing his deep regret for the unfortunate death of Du Barri, with whom for many years he had been bound in ties of the strictest friendship. These considerations appear to have weighed with the jury, and this fierce duellist was again found guilty of manslaughter only, and escaped with a merely nominal punishment.

A duel, less remarkable from its circumstances, but more so from the rank of the parties, took place in 1789. The combatants on this occasion were the Duke of York and Colonel Lenox, the nephew and heir of the Duke of Richmond. The cause of offence was given by the Duke of York, who had said in presence of several officers of the Guards, that words had been used to Colonel Lenox at Daubigny's to which no gentleman ought to have submitted. Colonel Lenox went up to the duke on parade, and asked him publicly whether he had made such an assertion. The Duke of York, without answering his question, coldly ordered him to his post. When parade was over, he took an opportunity of saying publicly in the orderly-room before Colonel Lenox, that he desired no protection from his rank as a prince and his station as commanding officer; adding that, when he was off duty he wore a plain brown coat like a private gentleman, and was ready as such to give satisfaction. Colonel Lenox desired nothing better than satisfaction; that is to say, to run the chance of shooting the duke through the body, or being himself shot. He accordingly challenged his Royal Highness, and they met on Wimbledon

Common. Colonel Lenox fired first, and the ball whizzed past the head of his opponent, so near to it as to graze his projecting curl. The duke refused to return the fire, and the seconds interfering, the affair terminated.

Colonel Lenox was very shortly afterwards engaged in another duel arising out of this. A Mr. Swift wrote a pamphlet in reference to the dispute between him and the Duke of York, at some expressions in which he took so much offence, as to imagine that nothing but a shot at the writer could atone for them. They met on the Uxbridge Road, but no damage was done to either party.

The Irish were for a long time renowned for their love of duelling. The slightest offence which it is possible to imagine that one man could offer to another was sufficient to provoke a challenge. Sir Jonah Barrington relates, in his *Memoirs*, that, previous to the Union, during the time of a disputed election in Dublin, it was no unusual thing for three-and-twenty duels to be fought in a day. Even in times of less excitement, they were so common as to be deemed unworthy of note by the regular chroniclers of events, except in cases where one or both of the combatants were killed.

In those days, in Ireland, it was not only the man of the military, but of every profession, who had to work his way to eminence with the sword or the pistol. Each political party had its regular corps of bullies, or fire-eaters, as they were called, who qualified themselves for being the pests of society by spending all their spare time in firing at targets. They boasted that they could hit an opponent in any part of his body they pleased, and made up their minds before the encounter began whether they should kill him, disable, or disfigure

him for life—lay him on a bed of suffering for a twelvemonth, or merely graze a limb.

The evil had reached an alarming height, when, in the year 1808, an opportunity was offered to King George III. of shewing in a striking manner his detestation of the practice, and of setting an example to the Irish that such murders were not to be committed with impunity. A dispute arose, in the month of June 1807, between Major Campbell and Captain Boyd, officers of the 21st regiment, stationed in Ireland, about the proper manner of giving the word of command on parade. Hot words ensued on this slight occasion, and the result was a challenge from Campbell to Boyd. They retired into the mess-room shortly afterwards, and each stationed himself at a corner, the distance obliquely being but seven paces. Here, without friends or seconds being present, they fired at each other, and Captain Boyd fell mortally wounded between the fourth and fifth ribs. A surgeon, who came in shortly, found him sitting in a chair, vomiting and suffering great agony. He was led into another room, Major Campbell following, in great distress and perturbation of mind. Boyd survived but eighteen hours, and just before his death, said, in reply to a question from his opponent, that the duel was not fair, and added, “You hurried me, Campbell—you’re a bad man.”—“Good God!” replied Campbell, “will you mention before these gentlemen, was not every thing fair? Did you not say that you were ready?” Boyd answered faintly, “Oh, no! you know I wanted you to wait and have friends.” On being again asked whether all was fair, the dying man faintly murmured, “Yes:” but in a minute after, he said, “You’re a bad man!” Campbell was now in great agitation, and ringing his hands convulsively, he exclaimed, “Oh, Boyd! you are the

happiest man of the two! Do you forgive me?” Boyd replied, “I forgive you—I feel for you, as I know you do for me.” He shortly afterwards expired, and Major Campbell made his escape from Ireland, and lived for some months with his family under an assumed name, in the neighbourhood of Chelsea. He was, however, apprehended, and brought to trial at Armagh, in August 1808. He said while in prison, that, if found guilty of murder, he should suffer as an example to duellists in Ireland; but he endeavoured to buoy himself up with the hope that the jury would only convict him of manslaughter. It was proved in evidence upon the trial, that the duel was not fought immediately after the offence was given, but that Major Campbell went home and drank tea with his family before he sought Boyd for the fatal encounter. The jury returned a verdict of wilful murder against him, but recommended him to mercy on the ground that the duel had been a fair one. He was condemned to die on the Monday following, but was afterwards respited for a few days longer. In the mean time the greatest exertions were made in his behalf. His unfortunate wife went upon her knees before the Prince of Wales, to move him to use his influence with the king in favour of her unhappy husband. Every thing a fond wife and a courageous woman could do she tried, to gain the royal clemency; but George III. was inflexible, in consequence of the representations of the Irish viceroy that an example was necessary. The law was therefore allowed to take its course, and the victim of a false spirit of honour died the death of a felon.

The most inveterate duellists of the present day are the students in the Universities of Germany. They fight on the most frivolous pretences, and settle with swords and pistols the schoolboy disputes

which in other countries are arranged by the more harmless medium of the fisticuffs. It was at one time the custom among these savage youths to prefer the sword-combat, for the facility it gave them of cutting off the noses of their opponents. To disfigure them in this manner was an object of ambition, and the German duellists reckoned the number of these disgusting trophies which they had borne away, with as much satisfaction as a successful general the provinces he had reduced or the cities he had taken.

But it would be wearisome to enter into the minute detail of all the duels of modern times. If an examination were made into the general causes which produced them, it would be found that in every case they had been either of the most trivial or the most unworthy nature. Parliamentary duels were at one time very common, and amongst the names of those who have soiled a great reputation by conforming to the practice, may be mentioned those of Warren Hastings, Sir Philip Francis, Wilkes, Pitt, Fox, Grattan, Curran, Tierney, and Canning. So difficult is it even for the superior mind to free itself from the trammels with which foolish opinion has enswathed it—not one of these celebrated persons who did not in his secret soul condemn the folly to which he lent himself. The bonds of reason, though iron-strong, are easily burst through; but those of folly, though lithe and frail as the rushes by a stream, defy the stoutest heart to snap them asunder. Colonel Thomas, an officer in the Guards, who was killed in a duel, added the following clause to his will the night before he died:—“In the first place, I commit my soul to Almighty God, in hope of his mercy and pardon for the irreligious step I now (in compliance with the unwarrantable customs of this wicked world) put myself under the necessity of taking.” How many

have been in the same state of mind as this wise, foolish man! He knew his error, and abhorred it, but could not resist it for fear of the opinion of the prejudiced and unthinking. No other could have blamed him for refusing to fight a duel.

The list of duels that have sprung from the most degrading causes might be stretched out to an almost indefinite extent. Sterne's father fought a duel about a goose; and the great Raleigh about a tavern-bill.⁶⁸ Scores of duels (many of them fatal) have been fought from disputes at cards, or a place at a theatre; while hundreds of challenges, given and accepted over-night, in a fit of drunkenness, have been fought out the next morning to the death of one or both of the antagonists.

Two of the most notorious duels of modern times had their origin in causes no more worthy than the quarrel of a dog and the favour of a prostitute: that between Macnamara and Montgomery arising from the former; and that between Best and Lord Camelford from the latter. The dog of Montgomery attacked a dog belonging to Macnamara, and each master interfering in behalf of his own animal, high words ensued. The result was the giving and accepting a challenge to mortal combat. The parties met on the following day, when Montgomery was shot dead, and his antagonist severely wounded. The affair created a great sensation at the time, and Heaviside, the surgeon who attended at the fatal field to render his assistance if necessary, was arrested as an accessory to the murder, and committed to Newgate.

In the duel between Best and Lord Camelford, two pistols were used which were considered to be the best in England. One of them was thought slightly superior to the other, and it was agreed that the

belligerents should toss up a piece of money to decide the choice of weapons. Best gained it, and at the first discharge, Lord Camelford fell mortally wounded. But little sympathy was expressed for his fate; he was a confirmed duellist, had been engaged in many meetings of the kind, and the blood of more than one fellow-creature lay at his door. As he had sowed, so did he reap; and the violent man met an appropriate death.

It now only remains to notice the means that have been taken to stay the prevalence of this madness of false honour in the various countries of the civilised world. The efforts of the governments of France and England have already been mentioned, and their want of success is but too well known. The same efforts have been attended with the same results elsewhere. In despotic countries, where the will of the monarch has been strongly expressed and vigorously supported, a diminution of the evil has for a time resulted, but only to be increased again, when death relaxed the iron grasp, and a successor appeared of less decided opinions on the subject. This was the case in Prussia, under the great Frederick, of whose aversion to duelling a popular anecdote is recorded. It is stated of him that he permitted duelling in his army, but only upon the condition that the combatants should fight in presence of a whole battalion of infantry, drawn up on purpose to see fair play. The latter received strict orders, when one of the belligerents fell, to shoot the other immediately. It is added, that the known determination of the king effectually put a stop to the practice.

The Emperor Joseph II. of Austria was as firm as Frederick, although the measures he adopted were not so singular. The following letter explains his views on the subject:

“TO GENERAL * * * * *

“MY GENERAL,

“You will immediately arrest the Count of K. and Captain W. The count is young, passionate, and influenced by wrong notions of birth and a false spirit of honour. Captain W. is an old soldier, who will adjust every dispute with the sword and pistol, and who has received the challenge of the young count with unbecoming warmth.

“I will suffer no duelling in my army. I despise the principles of those who attempt to justify the practice, and who would run each other through the body in cold blood.

“When I have officers who bravely expose themselves to every danger in facing the enemy—who at all times exhibit courage, valour, and resolution in attack and defence, I esteem them highly. The coolness with which they meet death on such occasions is serviceable to their country, and at the same time redounds to their own honour; but should there be men amongst them who are ready to sacrifice every thing to their vengeance and hatred, I despise them. I consider such a man as no better than a Roman gladiator.

“Order a court-martial to try the two officers. Investigate the subject of their dispute with that impartiality which I demand from every judge; and he that is guilty, let him be a sacrifice to his fate and the laws.

“Such a barbarous custom, which suits the age of the Tamerlanes and Bajazets, and which has often had such melancholy effects on single families, I will have suppressed and

punished, even if it should deprive me of one half of my officers. There are still men who know how to unite the character of a hero with that of a good subject; and he only can be so who respects the laws.

*“August, 1771. JOSEPH .”*⁶⁹

In the United States of America the code varies considerably. In one or two of the still wild and simple states of the far West, where no duel has yet been fought, there is no specific law upon the subject beyond that in the Decalogue, which says, “Thou shalt do no murder;” but duelling every where follows the steps of modern civilisation; and by the time the backwoodsman is transformed into the citizen, he has imbibed the false notions of honour which are prevalent in Europe and around him, and is ready, like his progenitors, to settle his differences with the pistol. In the majority of the States the punishment for challenging, fighting, or acting as second, is solitary imprisonment and hard labour for any period less than a year, and disqualification for serving any public office for twenty years. In Vermont the punishment is total disqualification for office, deprivation of the rights of citizenship, and a fine; in fatal cases, the same punishment as that of murderers. In Rhode Island, the combatant, though death does not ensue, is liable to be carted to the gallows, with a rope about his neck, and to sit in this trim for an hour exposed to the peltings of the mob. He may be further imprisoned for a year, at the option of the magistrate. In Connecticut the punishment is total disqualification for office or employ, and a fine varying from one hundred to a thousand dollars. The laws of Illinois require certain officers of the state to make oath, previous to

their instalment, that they have never been, nor ever will be, concerned in a duel.⁷⁰

Amongst the edicts against duelling, promulgated at various times in Europe, may be mentioned that of Augustus King of Poland, in 1712, which decreed the punishment of death against principals and seconds, and minor punishments against the bearers of a challenge. An edict was also published at Munich, in 1773, according to which both principals and seconds, even in duels where no one was either killed or wounded, should be hanged, and their bodies buried at the foot of the gallows.

The king of Naples issued an ordinance against duelling in 1838, in which the punishment of death is decreed against all concerned in a fatal duel. The bodies of those killed, and of those who may be executed in consequence, are to be buried in unconsecrated ground, and without any religious ceremony; nor is any monument to be erected on the spot. The punishment for duels in which either, or both, are wounded, and for those in which no damage whatever is done, varies according to the case, and consists of fine, imprisonment, loss of rank and honours, and incapacity for filling any public situation. Bearers of challenges may also be punished with fine and imprisonment.

It might be imagined that enactments so severe all over the civilised world would finally eradicate a custom, the prevalence of which every wise and good man must deplore. But the frowns of the law never yet have taught, and never will teach, men to desist from this practice, as long as it is felt that the lawgiver sympathises with it in his heart. The stern judge upon the bench may say to the unfortunate wight who has been called a liar by some unmannerly

opponent, "If you challenge him, you meditate murder, and are guilty of murder!" but the same judge, divested of his robes of state, and mixing in the world with other men, would say, "If you do not challenge him, if you do not run the risk of making yourself a murderer, you will be looked upon as a mean-spirited wretch, unfit to associate with your fellows, and deserving nothing but their scorn and their contempt!" It is society, and not the duellist, who is to blame. Female influence too, which is so powerful in leading men either to good or to evil, takes in this case the evil part. Mere animal bravery has, unfortunately, such charms in the female eye, that a successful duellist is but too often regarded as a sort of hero; and the man who refuses to fight, though of truer courage, is thought a poltroon, who may be trampled on. Mr. Graves, a member of the American legislature, who, early in 1838, killed a Mr. Cilley in a duel, truly and eloquently said, on the floor of the House of Representatives, when lamenting the unfortunate issue of that encounter, that society was more to blame than he was. "Public opinion," said the repentant orator, "is practically the paramount law of the land. Every other law, both human and divine, ceases to be observed; yea, withers and perishes in contact with it. It was this paramount law of this nation and of this House that forced me, under the penalty of dishonour, to subject myself to the code, which impelled me unwillingly into this tragical affair. Upon the heads of this nation, and at the doors of this House, rests the blood with which my unfortunate hands have been stained!"

As long as society is in this mood; as long as it thinks that the man who refuses to resent an insult, deserved that insult, and should be scouted accordingly; so long, it is to be feared, will duelling exist,

however severe the laws may be. Men must have redress for injuries inflicted; and when those injuries are of such a nature that no tribunal will take cognisance of them, the injured will take the law into their own hands, and right themselves in the opinion of their fellows, at the hazard of their lives. Much as the sage may affect to despise the opinion of the world, there are few who would not rather expose their lives a hundred times than be condemned to live on, in society, but not of it—a by-word of reproach to all who know their history, and a mark for scorn to point his finger at.

The only practicable means for diminishing the force of a custom which is the disgrace of civilisation, seems to be the establishment of a court of honour, which should take cognisance of all those delicate and almost intangible offences which yet wound so deeply. The court established by Louis XIV. might be taken as a model. No man now fights a duel when a fit apology has been offered; and it should be the duty of this court to weigh dispassionately the complaint of every man injured in his honour, either by word or deed, and to force the offender to make a public apology. If he refused the apology, he would be the breaker of a second law; an offender against a high court, as well as against the man he had injured, and might be punished with fine and imprisonment, the latter to last until he saw the error of his conduct, and made the concession which the court demanded.

If, after the establishment of this tribunal, men should be found of a nature so bloodthirsty as not to be satisfied with its peaceful decisions, and should resort to the old and barbarous mode of an appeal to the pistol, some means might be found of dealing with them. To hang them as murderers would be of no avail; for to such

men death would have few terrors. Shame alone would bring them to reason. Transportation, the tread-wheel, or a public whipping, would perhaps be sufficient.

Shakspeare upon the leaf, written by the poet of all time himself; the chair preserved at Antwerp, in which Rubens sat when he painted the immortal Descent from the Cross; or the telescope, preserved in the Museum of Florence, which aided Galileo in his sublime discoveries. Who would not look with veneration upon the undoubted arrow of William Tell—the swords of Wallace or of Hampden—or the Bible whose leaves were turned by some stern old father of the faith?

Thus the principle of reliquism is hallowed and enshrined by love. But from this germ of purity how numerous the progeny of errors and superstitions! Men, in their admiration of the great, and of all that appertained to them, have forgotten that goodness is a component part of true greatness, and have made fools of themselves for the jawbone of a saint, the toe-nail of an apostle, the handkerchief a king blew his nose in, or the rope that hanged a criminal. Desiring to rescue some slight token from the graves of their predecessors, they have confounded the famous and the infamous, the renowned and the notorious. Great saints, great sinners; great philosophers, great quacks; great conquerors, great murderers; great ministers, great thieves; each and all have had their admirers, ready to ransack earth, from the equator to either pole, to find a relic of them.

The reliquism of modern times dates its origin from the centuries immediately preceding the Crusades. The first pilgrims to the Holy Land brought back to Europe thousands of apocryphal relics, in the purchase of which they had expended all their store. The greatest favourite was the wood of the true cross, which, like the oil of the widow, never diminished. It is generally asserted, in the traditions of the Romish Church, that the Empress Helen, the mother of Constantine the Great, first discovered the veritable “*true cross*” in her pilgrimage to Jerusalem. The Emperor Theodosius made a present of the greater part of it to St. Ambrose, Bishop of Milan, by whom it was studded with precious stones, and deposited in the principal church of that city. It was carried away by the Huns, by whom it was burnt, after they had extracted the valuable jewels it contained.

Fragments, purporting to have been cut from it, were, in the eleventh and twelfth centuries, to be found in almost every church in Europe, and would, if collected together in one place, have been almost sufficient to have built a cathedral. Happy was the sinner who could get a sight of one of them; happier he who possessed one! To obtain them the greatest dangers were cheerfully braved. They were thought to preserve from all evils, and to cure the most inveterate diseases. Annual pilgrimages were made to the shrines that contained them, and considerable revenues collected from the devotees.

Next in renown were those precious relics, the tears of the Saviour. By whom and in what manner they were preserved, the pilgrims did not inquire. Their genuineness was vouched by the Christians of the Holy Land, and that was sufficient. Tears of the Virgin Mary, and tears of St. Peter, were also to be had, carefully enclosed in little caskets, which the pious might wear in their bosoms. After the tears the next most precious relics were drops of the blood of Jesus and the martyrs, and the milk of the Virgin Mary. Hair and toe-nails were also in great repute, and were sold at extravagant prices. Thousands of pilgrims annually visited Palestine in the eleventh and twelfth centuries, to purchase pretended relics for the home market. The majority of them had no other means of subsistence than the profits thus obtained. Many a nail, cut from the filthy foot of some unscrupulous ecclesiastic, was sold at a diamond's price, within six months after its severance from its parent toe, upon the supposition that it had once belonged to a saint or an apostle. Peter's toes were uncommonly prolific, for there were nails enough in Europe, at the time of the Council of Clermont, to have filled a sack, all of which were devoutly believed to have grown on the sacred feet of that great apostle. Some of them are still shewn in the cathedral of Aix-la-Chapelle. The pious come from a distance of a hundred German miles to feast their eyes upon them.

At Port Royal, in Paris, is kept with great care a thorn, which the priests of that seminary assert to be one of the identical thorns that bound the holy

head of the Son of God. How it came there, and by whom it was preserved, has never been explained. This is the famous thorn, celebrated in the long dissensions of the Jansenists and the Molenists, and which worked the miraculous cure upon Mademoiselle Perrier: by merely kissing it she was cured of a disease of the eyes of long standing.⁷¹

What traveller is unacquainted with the Santa Scala, or Holy Stairs, at Rome? They were brought from Jerusalem along with the true cross, by the Empress Helen, and were taken from the house which, according to popular tradition, was inhabited by Pontius Pilate. They are said to be the steps which Jesus ascended and descended when brought into the presence of the Roman governor. They are held in the greatest veneration at Rome: it is sacrilegious to walk upon them. The knees of the faithful must alone touch them in ascending or descending, and that only after the pilgrims have reverentially kissed them.

Europe still swarms with these religious relics. There is hardly a Roman Catholic church in Spain, Portugal, Italy, France, or Belgium, without one or more of them. Even the poorly endowed churches of the villages boast the possession of miraculous thigh-bones of the innumerable saints of the Romish calendar. Aix-la-Chapelle is proud of the veritable *châsse*, or thigh-bone of Charlemagne, which cures lameness. Halle has a thigh-bone of the Virgin Mary; Spain has seven or eight, all said to be undoubted relics. Brussels at one time preserved, and perhaps does now, the teeth of St. Gudule. The faithful, who suffered from the toothache, had only to pray, look at them, and be cured. Some of these holy bones have been buried in different parts of the Continent. After a certain lapse of time, water is said to ooze from them, which soon forms a spring, and cures all the diseases of the faithful.

It is curious to remark the avidity manifested in all ages, and in all countries, to obtain possession of some relic of any persons who have been much spoken of, even for their crimes. When William Longbeard, leader of the populace of London in the reign of Richard I., was hanged at

Smithfield, the utmost eagerness was shewn to obtain a hair from his head, or a shred from his garments. Women came from Essex, Kent, Suffolk, Sussex, and all the surrounding counties, to collect the mould at the foot of his gallows. A hair of his beard was believed to preserve from evil spirits, and a piece of his clothes from aches and pains.

In more modern days, a similar avidity was shewn to obtain a relic of the luckless Masaniello, the fisherman of Naples. After he had been raised by mob favour to a height of power more despotic than monarch ever wielded, he was shot by the same populace in the streets, as if he had been a mad dog. His headless trunk was dragged through the mire for several hours, and cast at night-fall into the city ditch. On the morrow the tide of popular feeling turned once more in his favour. His corpse was sought, arrayed in royal robes, and buried magnificently by torch-light in the cathedral, ten thousand armed men, and as many mourners, attending at the ceremony. The fisherman's dress which he had worn was rent into shreds by the crowd, to be preserved as relics; the door of his hut was pulled off its hinges by a mob of women, and eagerly cut up into small pieces, to be made into images, caskets, and other mementos. The scanty furniture of his poor abode became of more value than the adornments of a palace; the ground he had walked upon was considered sacred, and, being collected in small phials, was sold at its weight in gold, and worn in the bosom as an amulet.

Almost as extraordinary was the frenzy manifested by the populace of Paris on the execution of the atrocious Marchioness de Brinvilliers. There were grounds for the popular wonder in the case of Masaniello, who was unstained with personal crimes. But the career of Madame de Brinvilliers was of a nature to excite no other feelings than disgust and abhorrence. She was convicted of poisoning several persons, and sentenced to be burned in the Place de Grève, and to have her ashes scattered to the winds. On the day of her execution, the populace, struck by her gracefulness and beauty, inveighed against the severity of her sentence. Their pity soon increased to admiration, and, ere evening, she was considered a saint. Her ashes were

industriously collected; even the charred wood, which had aided to consume her, was eagerly purchased by the populace. Her ashes were thought to preserve from witchcraft.

In England many persons have a singular love for the relics of thieves and murderers, or other great criminals. The ropes with which they have been hanged are very often bought by collectors at a guinea per foot. Great sums were paid for the rope which hanged Dr. Dodd, and for those more recently which did justice upon Mr. Fauntleroy for forgery, and on Thurtell for the murder of Mr. Weare. The murder of Maria Marten, by Corder, in the year 1828, excited the greatest interest all over the country. People came from Wales and Scotland, and even from Ireland, to visit the barn where the body of the murdered woman was buried. Every one of them was anxious to carry away some memorial of his visit. Pieces of the barn-door, tiles from the roof, and, above all, the clothes of the poor victim, were eagerly sought after. A lock of her hair was sold for two guineas, and the purchaser thought himself fortunate in getting it so cheaply.

So great was the concourse of people to visit the house in Camberwell Lane, where Greenacre murdered Hannah Brown, in 1837, that it was found necessary to station a strong detachment of police on the spot. The crowd was so eager to obtain a relic of the house of this atrocious criminal, that the police were obliged to employ force to prevent the tables and chairs, and even the doors, from being carried away.

In earlier times, a singular superstition was attached to the hand of a criminal who had suffered execution. It was thought that by merely rubbing the dead hand on the body, the patient afflicted with the king's evil would be instantly cured. The executioner at Newgate formerly derived no inconsiderable revenue from this foolish practice. The possession of the hand was thought to be of still greater efficacy in the cure of diseases and the prevention of misfortunes. In the time of Charles II., as much as ten guineas was thought a small price for one of these disgusting relics.

When the maniac, Thom, or Courtenay, was shot, in the spring of 1838, the relic-hunters were immediately in motion to obtain a memento of so extraordinary an individual. His long black beard and hair, which were cut off by the surgeons, fell into the hands of his disciples, by whom they were treasured with the utmost reverence. A lock of his hair commanded a great price, not only amongst his followers, but among the more wealthy inhabitants of Canterbury and its neighbourhood. The tree against which he fell when he was shot, was stripped of all its bark by the curious; while a letter, with his signature to it, was paid for in gold coins; and his favourite horse became as celebrated as its master. Parties of ladies and gentlemen went to Boughton from a distance of a hundred and fifty miles, to visit the scene of that fatal affray, and stroke on the back the horse of the “mad knight of Malta.” If a strict watch had not been kept over his grave for months, the body would have been disinterred, and the bones carried away as memorials.

Among the Chinese no relics are more valued than the *boots* which have been worn by an upright magistrate. In Davis’s interesting description of the empire of China, we are informed, that whenever a judge of unusual integrity resigns his situation, the people all congregate to do him honour. If he leaves the city where he has presided, the crowd accompany him from his residence to the gates, where his boots are drawn off with great ceremony, to be preserved in the hall of justice. Their place is immediately supplied by a new pair, which, in their turn, are drawn off to make room for others before he has worn them five minutes, it being considered sufficient to consecrate them that he should have merely drawn them on.

Among the most favourite relics of modern times, in Europe, are Shakspeare’s mulberry-tree, Napoleon’s willow, and the table at Waterloo on which the emperor wrote his despatches. Snuff-boxes of Shakspeare’s mulberry-tree are comparatively rare, though there are doubtless more of them in the market than were ever made of the wood planted by the great bard. Many a piece of alien wood passes under this name. The same may be

said of Napoleon's table at Waterloo. The original has long since been destroyed, and a round dozen of counterfeits along with it. Many preserve the simple stick of wood; others have them cut into brooches and every variety of ornament; but by far the greater number prefer them as snuff-boxes. In France they are made into *bonbonnières*, and are much esteemed by the many thousands whose cheeks still glow and whose eyes still sparkle at the name of Napoleon.

Bullets from the field of Waterloo, and buttons from the coats of the soldiers who fell in the fight, are still favourite relics in Europe. But the same ingenuity which found new tables after the old one was destroyed, has cast new bullets for the curious. Many a one who thinks himself the possessor of a bullet which aided in giving peace to the world on that memorable day, is the owner of a dump, first extracted from the ore a dozen years afterwards. Let all lovers of genuine relics look well to their money before they part with it to the ciceroni that swarm in the village of Waterloo!

Few travellers stopped at the lonely isle of St. Helena without cutting a twig from the willow that drooped over the grave of Napoleon, prior to the removal of the body by the government of Louis Philippe. Many of them have since been planted in different parts of Europe, and have grown into trees as large as their parent. Relic-hunters, who are unable to procure a twig of the original, are content with one from these. Several of them are growing in the neighbourhood of London.

But in relics, as in every thing else, there is the use and the abuse. The undoubted relics of great men, or great events, will always possess attractions for the thinking and refined. There are few who would not join with Cowley in the extravagant wish introduced in his lines "written while sitting in a chair made of the remains of the ship in which Sir Francis Drake sailed round the world:"

And I myself, who now love quiet too,
Almost as much, as any chair can do,
Would yet a journey take
 An old wheel of that chariot to see,
Which Phaeton so rashly brake.

Footnotes

1. Guibert de Nogent.

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2. Guibert de Nogent.

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3. Guibert de Nogent.

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4. M. Wilken's *Geschichte der Kreuzzüge*.

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5. Wilken.

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6. Fulcher of Chartres; Guibert de Nogent; Vital.

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7. William of Tyre; Mills; Wilken, &c.

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8. Vide William of Tyre.

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9. Guibert de Nogent relates a curious instance of the imitateness of these juvenile Crusaders. He says that, during

the siege of Antioch, the Christian and Saracen boys used to issue forth every evening from the town and camp in great numbers, under the command of captains chosen from among themselves. Armed with sticks instead of swords, and stones instead of arrows, they ranged themselves in battle order, and, shouting each the war-cry of their country, fought with the utmost desperation. Some of them lost their eyes, and many became cripples for life from the injuries they received on these occasions.

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10. The sacking of Vitry reflects indelible disgrace upon Louis VII. His predecessors had been long engaged in resistance to the outrageous powers assumed by the Popes, and Louis continued the same policy. The ecclesiastical chapter of Bourges, having elected an archbishop without his consent, he proclaimed the election to be invalid, and took severe and prompt measures against the refractory clergy. Thibault count de Champagne took up arms in defence of the Papal authority, and entrenched himself in the town of Vitry. Louis immediately took the field to chastise the rebel, and he besieged the town with so much vigour that the count was forced to surrender. Upwards of thirteen hundred of the inhabitants, fully one half of whom were women and children, took refuge in the church; and, when the gates of the city were opened, and all resistance had ceased, Louis inhumanly gave orders to set fire to the sacred edifice, and a thousand persons perished in the flames.

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11. Philip, Archdeacon of the cathedral of Liege, wrote a detailed account of all the miracles performed by St. Bernard during

thirty-four days of his mission. They averaged about ten per day. The disciples of St. Bernard complained bitterly that the people flocked around their master in such numbers, that they could not see half the miracles he performed. But they willingly trusted the eyes of others, as far as faith in the miracles went, and seemed to vie with each other whose credulity should be greatest.

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12. James of Vitry; William de Nangis.

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13. The desire of comparing two great men has tempted many writers to drown Frederick in the river Cydnus, in which Alexander so imprudently bathed (Q. Curt. lib. iii. c. 4, 5); but, from the march of the emperor, I rather judge that his Saleph is the Calycadnus, a stream of less fame, but of a longer course.—
Gibbon.

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14. Stowe.

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15. *Elémens de l'Histoire de France*

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16. Strutt's *Sports and Pastimes*.

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17. Richard left a high reputation in Palestine. So much terror did his name occasion, that the women of Syria used it to frighten their children for ages afterwards. Every disobedient child became still when told that King Richard was coming. Even men shared the panic that his name created; and a hundred years afterwards, whenever a horse shied at any object in the way, his

rider would exclaim, “What! dost thou think King Richard is in the bush?”

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18. The following is a list of some of the works of art thus destroyed, from Nicetas, a contemporary Greek author: 1st. A colossal Juno, from the forum of Constantine, the head of which was so large that four horses could scarcely draw it from the place where it stood to the palace. 2^d. The statue of Paris, presenting the apple to Venus. 3^d. An immense bronze pyramid, crowned by a female figure, which turned with the wind. 4th. The colossal statue of Bellerophon, in bronze, which was broken down and cast into the furnace. Under the inner nail of the horse’s hind foot on the left side, was found a seal wrapped in a woollen cloth. 5th. A figure of Hercules, by Lysimachus, of such vast dimensions that the thumb was equal in circumference to the waist of a man. 6th. The Ass and his Driver, cast by order of Augustus after the battle of Actium, in commemoration of his having discovered the position of Anthony through the means of an ass-driver. 7th. The Wolf suckling the Twins of Rome. 8th. The gladiator in combat with a lion. 9th. The Hippopotamus. 10th. The Sphinxes. 11th. An Eagle fighting with a Serpent. 12th. A beautiful statue of Helen. 13th. A group, with a monster somewhat resembling a bull, engaged in deadly conflict with a serpent; and many other works of art, too numerous to mention.

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19. See Jacob de Voragine and Albericus.

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20. *Elémens de l’Histoire de France.*

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21. Mills, in his history, gives the name of this chief as “Al Malek al Dhaker Rok neddin Abulfeth Bibars al Ali al Bundokdari al Salehi.”
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22. The reader will recognise the incident which Sir Walter Scott has introduced into his beautiful romance, *The Talisman*, and which, with the license claimed by poets and romancers, he represents as having befallen King Richard I.
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23. See article on “Demonology” in the sixth volume of the *Foreign Quarterly Review*.
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24. *Histoire de la Magie en France*. Rois de la seconde race, p. 29.
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25. M. Michaud, in his *History of the Crusades*, M. Guinguené, in his *Literary History of Italy*, and some other critics, have objected to Tasso’s poem, that he has attributed to the Crusaders a belief in magic, which did not exist at that time. If these critics had referred to the edicts of Charlemagne, they would have seen that Tasso was right, and that a disposition too eager to spy out imperfections in a great work was leading themselves into error.
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26. *Entstehungsgeschichte der freistädtlichen Bünde im Mittelalter*, von Dr. F. Kortüm. 1827.
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27. Bodin, p. 95 Garinet, p. 125; *Anti-demon de Serclier*, p. 346.
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28. Tablier. See also Boguet, *Discours sur les Sorciers*; and M. Jules Garinet, *Histoire de la Magie*, p. 150.

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29. *Foreign Quarterly Review*, vol. vi. p. 41.

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30. *News from Scotland, declaring the Damnable Life of Dr. Fian.*

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31. *Satan's Invisible World Discovered*, by the Rev. G. Sinclair.

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32. This illustration, representing Matthew Hopkins examining two witches, who are confessing to him the names of their imps and familiars, is copied from Caulfield's *Memoirs of Remarkable Persons*, 1794, where it is taken from an extremely rare print.

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33. *Pitcairn's Records of Justiciary.*

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34. Preface to *Law's Memorials*, edited by Sharpe.

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35. *Zauberbibliothek*, Thiel 5.

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36. They sent a hangman's assistant down to her in her prison; they clothed him properly in a bear's skin, as if he were the devil. Him, when the witch saw, she thought he was her familiar. She said to him quickly, "Why hast thou left me so long in the magistrate's hands? Help me out of their power, as thou hast promised, and I will be thine alone. Help me from this anguish, O thou dearest devil [or lover] mine!"

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37. A very graphic account of the execution of this unfortunate gentleman is to be found in the excellent romance of M. Alfred de Vigny, entitled *Cinq Mars*; but if the reader wishes for a full and accurate detail of all the circumstances of one of the most extraordinary trials upon record, he is referred to a work published anonymously, at Amsterdam, in 1693, entitled *Histoire des Diables de Loudun, ou de la Possession des Religieuses Ursulines, et de la Condemnation et du Supplice d'Urbain Grandier*.

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38. The punishment for the contumacious was expressed by the words *onere, frigore, et fame*. By the first was meant, that the culprit should be extended on his back on the ground, and weights placed over his body, gradually increased, until he expired. Sometimes the punishment was not extended to this length, and the victim being allowed to recover, underwent the second portion, the *frigore*, which consisted in his standing naked in the open air, for a certain space, in the sight of all the people. The third, or *fame*, was more dreadful, the statute saying, "That he was to be preserved with the coarsest bread that could be got, and water out of the next sink, or puddle, to the place of execution; and that day he had water he should have no bread, and that day he had bread he should have no water;" and in this torment he was to linger as long as nature would hold out.

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39. This is denied by Voltaire in his *Age of Louis XIV.*; but he does not state for what reason. His words are, "Il est faux qu'elle eut essayé ses poisons dans les hôpitaux, comme le disait le peuple,

et comme il est écrit dans les *Causes Célèbres*, ouvrage d'un avocat sans cause et fait pour le peuple.”

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40. Slow poisoning is a crime which has unhappily been revived in England within the last few years, and which has been carried to an extent sufficient to cast a stain upon the national character. The poisoners have been principally women of the lowest class, and their victims have been their husbands or their children. The motive for the crime has in most instances been the basest that can be imagined,—the desire to obtain from burial-clubs to which they subscribed, the premium, or burial-money. A recent enactment, restricting the sale of arsenic and other poisons, will, it is to be hoped, check, if it do not extirpate this abominable crime.—1851.

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41. Garinet, *Histoire de la Magie en France*, p. 75.

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42. Ibid. p. 156.

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43. Dr. H. More's *Continuation of Glanvil's Collection of Relations in proof of Witchcraft*.

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44. The woman whose ghost was said to manifest itself in Cock Lane was buried in the crypt or cloister of St. John, Clerkenwell. The vault is composed of two aisles, that on the south being much narrower than the other,—it was here she was deposited.

About seven years since, I was sketching a picturesque trefoil-headed door leading into this part of the vault; and the place being at that time in great confusion with coffins, remains of

bodies, some of which were dried like mummies, &c., I could find no better seat than one of the coffins. The sexton's boy, who held my light, informed me this was the coffin of *Scratching Fanny*, which recalled the Cock Lane story to my mind. I got off the lid of the coffin, and saw the face of a handsome woman, with an aquiline nose; this feature remaining perfect, an uncommon case, for the cartilage mostly gives way. The remains had become adipocere, and were perfectly preserved. She was said to have been poisoned by deleterious punch, but this was legally disproved; and, if I remember rightly, she was otherwise declared to have died of small-pox; of this disease there was not the least sign; but as some mineral poisons tend to render bodies adipocere, here was some evidence in support of the former allegation. I made particular inquiries at the time of Mr. Bird, churchwarden, a respectable and judicious man; and he gave me good assurance that this coffin had always been looked upon as the one containing the Cock Lane woman. Since that time the vault has been set in order, and the above-mentioned coffin, with others, put away.

The niche near the window in the drawing of the Ghost Room is the place where the bed-head was, and where the scratching, knocks, &c. were heard. This is the tradition of the house. Mrs. King, who holds the premises, informs me that her family has had the house about eighty years.—J. W. ARCHER.

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45. Shakspeare's *Rape of Lucretia*.

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46. The Abbé, in the second volume, in the letter No. 79, addressed to Monsieur de Buffon, gives the following curious

particulars of the robbers of 1737, which are not without interest at this day, if it were only to shew the vast improvement which has taken place since that period. “It is usual in travelling to put ten or a dozen guineas in a separate pocket, as a tribute to the first that comes to demand them the right of passport, which custom has established here in favour of the robbers, who are almost the only highway surveyors in England, has made this necessary; and accordingly the English call these fellows the ‘Gentlemen of the Road,’ the government letting them exercise their jurisdiction upon travellers without giving them any great molestation. To say the truth, they content themselves with only taking the money of those who obey without disputing; but notwithstanding their boasted humanity, the lives of those who endeavour to get away are not always safe. They are very strict and severe in levying their impost; and if a man has not wherewithal to pay them, he may run the chance of getting himself knocked on the head for his poverty.

“About fifteen years ago, these robbers, with the view of maintaining their rights, fixed up papers at the doors of rich people about London, expressly forbidding all persons, of whatsoever quality or condition, from going out of town without ten guineas and a watch about them, on pain of death. In bad times, when there is little or nothing to be got on the roads, these fellows assemble in gangs, to raise contributions even in London itself, and the watchmen seldom trouble themselves to interfere with them in their vocation.”

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47. Since the publication of the first edition of this volume, Jack Sheppard's adventures have been revived. A novel upon the real or fabulous history of the burglar has afforded, by its extraordinary popularity, a further exemplification of the allegations in the text. The *Sixth Report of the Inspector of Prisons for the Northern Districts of England* contains a mass of information upon the pernicious effect of such romances, and of the dramas founded upon them. The Inspector examined several boys attending the prison school in the New Bailey at Manchester, from whose evidence the following passages bearing upon the subject are extracted:

“J. L. (aged 14). The first time I was ever at the theatre was to see *Jack Sheppard*. There were two or three boys near to the house who were going, and they asked me. I took sixpence from the money I used to lay up weekly for clothes. The next time I went, which was the week after, I borrowed the money from a boy; I returned it to him the Saturday after. I then went many times. I took the money from my mother out of her pocket as she was sitting down, and I beside her. There was more than sixpence in her pocket. I got a great love for the theatre, and stole from people often to get there. *I thought this Jack Sheppard was a clever fellow* for making his escape and robbing his master. *If I could get out of gaol, I think I should be as clever as him:* but, after all his exploits, he got done at last. I have had the book out of a library at Dole Field. I had paid two-pence a book for three volumes. I also got *Richard*

Turpin, in two volumes, and paid the same. I have seen *Oliver Twist*, and think the Artful Dodger is very like some of the boys here. I am here for picking a pocket of 25*l.*

“H. C. (aged 15). When we came to Manchester, I went to the play, and saw *Jack Sheppard* the first night it came out. There were pictures of him about the streets on boards and on the walls; one of them was his picking a pocket in the church. I liked *Jack Sheppard* much. I had not been in prison there. I was employed in a warehouse at 6*s.* 6*d.* a-week, and was allowed 6*d.* out of it for myself, and with that I went regularly to the play. I saw *Jack Sheppard* afterwards four times in one week. I got the money out of my money-bag by stealth, and without my master’s knowledge. I once borrowed 10*s.* in my mother’s name from Mrs. —, a shopkeeper, with whom she used to deal; I went to the play with it.

“J. M’D. (aged 15). I have heard of *Jack Sheppard*: a lad whom I know told me of it, who had seen it, and said it was *rare fun* to see him break out of prison.

“J. L. (aged 11). Has been to the play twice, and seen *Jack Sheppard*. Went with his brother the first time, and by himself the second. I took the money to go a second time out of mother’s house, off the chimney-piece, where she had left a sixpence. It was the first night *Jack Sheppard* was played. There was great talk about it, and there were nice pictures about it all over the walls. I thought him a very clever fellow; but Blueskin made the most fun. I first went to the markets, and begun by stealing apples. I also knew a

lad, —, who has been transported, and went with him two or three times. The most I ever got was 10s. out of a till.”

The Inspector's *Report on Juvenile Delinquency at Liverpool* contains much matter of the same kind; but sufficient has been already quoted to shew the injurious effects of the deification of great thieves by thoughtless novelists.

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48. For a full account of this noted robber, and indeed of European thieves and banditti in general, see the very amusing work upon the subject by Mr. Charles Macfarlane.

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49. See also *Foreign Quarterly Review*, vol. iv. p. 398.

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50. Lavinia Fenton, afterwards Duchess of Bolton.

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51. *Esprit des Loix*, liv. xxviii. chap. xvii.

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52. Very similar to this is the fire-ordeal of the modern Hindoos, which is thus described in Forbes's *Oriental Memoirs*, vol. i. c. xi.:—“When a man, accused of a capital crime, chooses to undergo the ordeal trial, he is closely confined for several days; his right hand and arm are covered with thick wax-cloth, tied up and sealed, in the presence of proper officers, to prevent deceit. In the English districts the covering was always sealed with the Company's arms, and the prisoner placed under an European guard. At the time fixed for the ordeal, a caldron of oil is placed over a fire; when it boils, a piece of money is dropped into the vessel; the prisoner's arm is unsealed and washed in the

presence of his judges and accusers. During this part of the ceremony the attendant Brahmins supplicate the Deity. On receiving their benediction, the accused plunges his hand into the boiling fluid, and takes out the coin. The arm is afterwards again sealed up until the time appointed for a re-examination. The seal is then broken; if no blemish appears, the prisoner is declared innocent; if the contrary, he suffers the punishment due to his crime.”... On this trial the accused thus addresses the element before plunging his hand into the boiling oil:—“Thou, O fire! pervadest all things. O cause of purity! who givest evidence of virtue and of sin, declare the truth in this my hand!” If no juggling were practised, the decisions by this ordeal would be all the same way; but as some are by this means declared guilty, and others innocent, it is clear that the Brahmins, like the Christian priests of the middle ages, practise some deception in saving those whom they wish to be thought guiltless.

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53. An ordeal very like this is still practised in India. Consecrated rice is the article chosen, instead of bread and cheese. Instances are not rare in which, through the force of imagination, guilty persons are not able to swallow a single grain. Conscious of their crime, and fearful of the punishment of Heaven, they feel a suffocating sensation in their throat when they attempt it, and they fall on their knees, and confess all that is laid to their charge. The same thing, no doubt, would have happened with the bread and cheese of the Roman Church, if it had been applied to any others but ecclesiastics. The latter had too much wisdom to be caught in a trap of their own setting.

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54. *Histoire de Messire Bertrand du Guesclin*, par Paul Hay du Chastelet, liv. i. ch. xix.

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55. *Esprit des Loix*, liv. xxviii. ch. xxv.

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56. *Mémoires de Brantôme touchant les Duels.*

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57. *Histoire de Messire Bertrand du Guesclin*, liv. i. ch. xix.

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58. *Mémoires de Brantôme touchant les Duels.*

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59. Although Francis shewed himself in this case an enemy to duelling, yet in his own case he had not the same objection. Every reader of history must remember his answer to the challenge of the Emperor Charles V. The Emperor wrote that he had failed in his word, and that he would sustain their quarrel single-handed against him. Francis replied, that he lied—*qu'il en avait menti par la gorge*, and that he was ready to meet him in single combat whenever and wherever he pleased.

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60. *Le Père Matthias*, tome ii. livre iv.

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61. *Elémens de l'Histoire de France*, vol. iii. p. 219.

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62. *Mercure de France*, vol. xiii.

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63. Brydone's *Tour in Malta*, 1772.

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64. See *Life and Character of Lord Bacon*, by Thomas Martin, Barrister-at-Law.

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65. See *History of the House and Clan of Mackay*.

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66. See *Spectator*, Nos. 84, 97, and 99; and *Tatler*, Nos. 25, 26, 29, 31, 38, and 39; and *Guardian*, No. 20.

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67. *Post-Boy*, December 13th, 1712.

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68. Raleigh at one period of his life appeared to be an inveterate duellist, and it was said of him that he had been engaged in more encounters of the kind than any man of note among his contemporaries. More than one fellow-creature he had deprived of life; but he lived long enough to be convinced of the sinfulness of his conduct, and made a solemn vow never to fight another duel. The following anecdote of his forbearance is well known, but it will bear repetition:

A dispute arose in a coffee-house between him and a young man on some trivial point, and the latter, losing his temper, impertinently spat in the face of the veteran. Sir Walter, instead of running him through the body, as many would have done, or challenging him to mortal combat, coolly took out his handkerchief, wiped his face, and said, "Young man, if I could as easily wipe from my conscience the stain of killing you, as I can this spittle from my face, you should not live another minute." The young man immediately begged his pardon.

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69. Vide the Letters of Joseph II. to distinguished Princes and Statesmen, published for the first time in England in *The Pamphleteer* for 1821. They were originally published in Germany a few years previously, and throw a great light upon the character of that monarch and the events of his reign.

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70. *Encyclopedia Americana*, art. Duelling.

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71. Voltaire, *Siècle de Louis XIV.*

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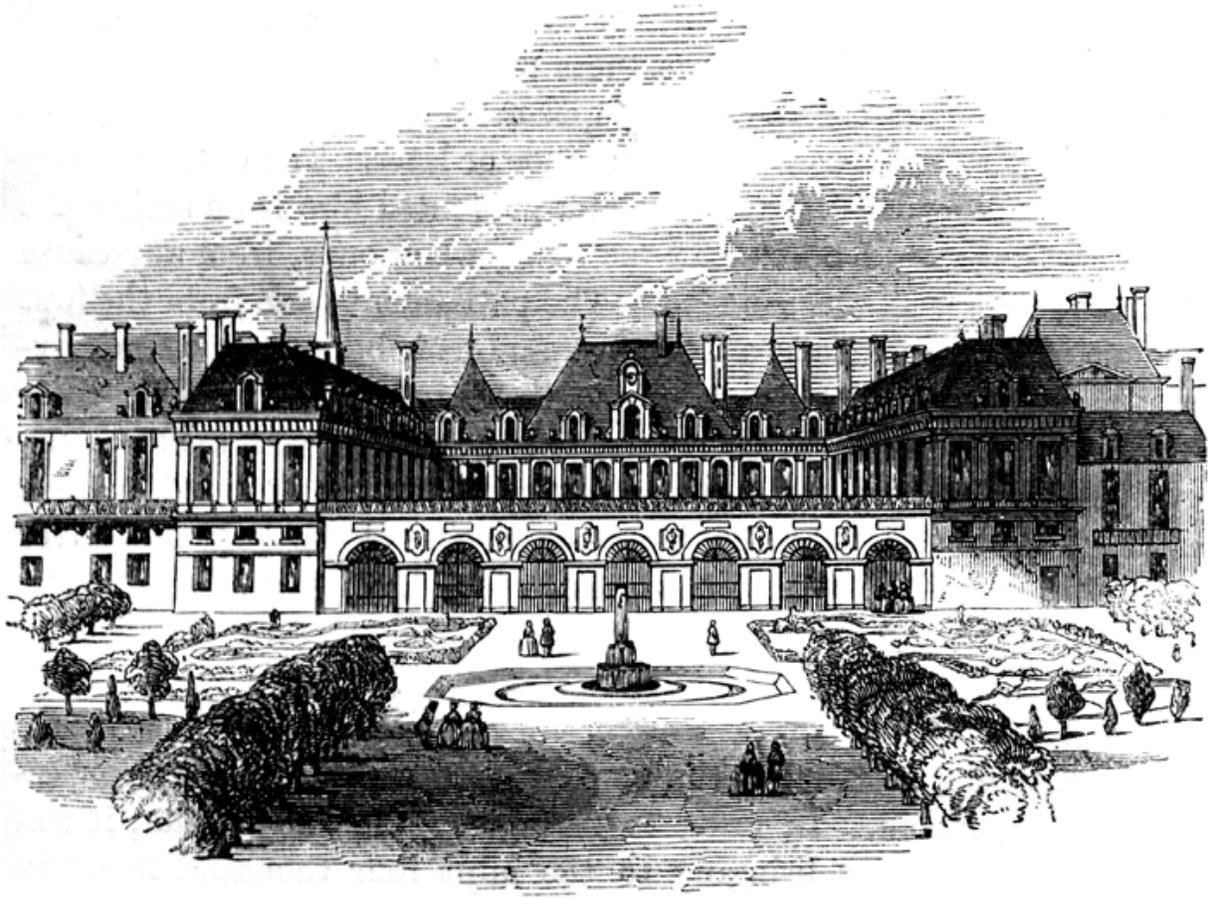
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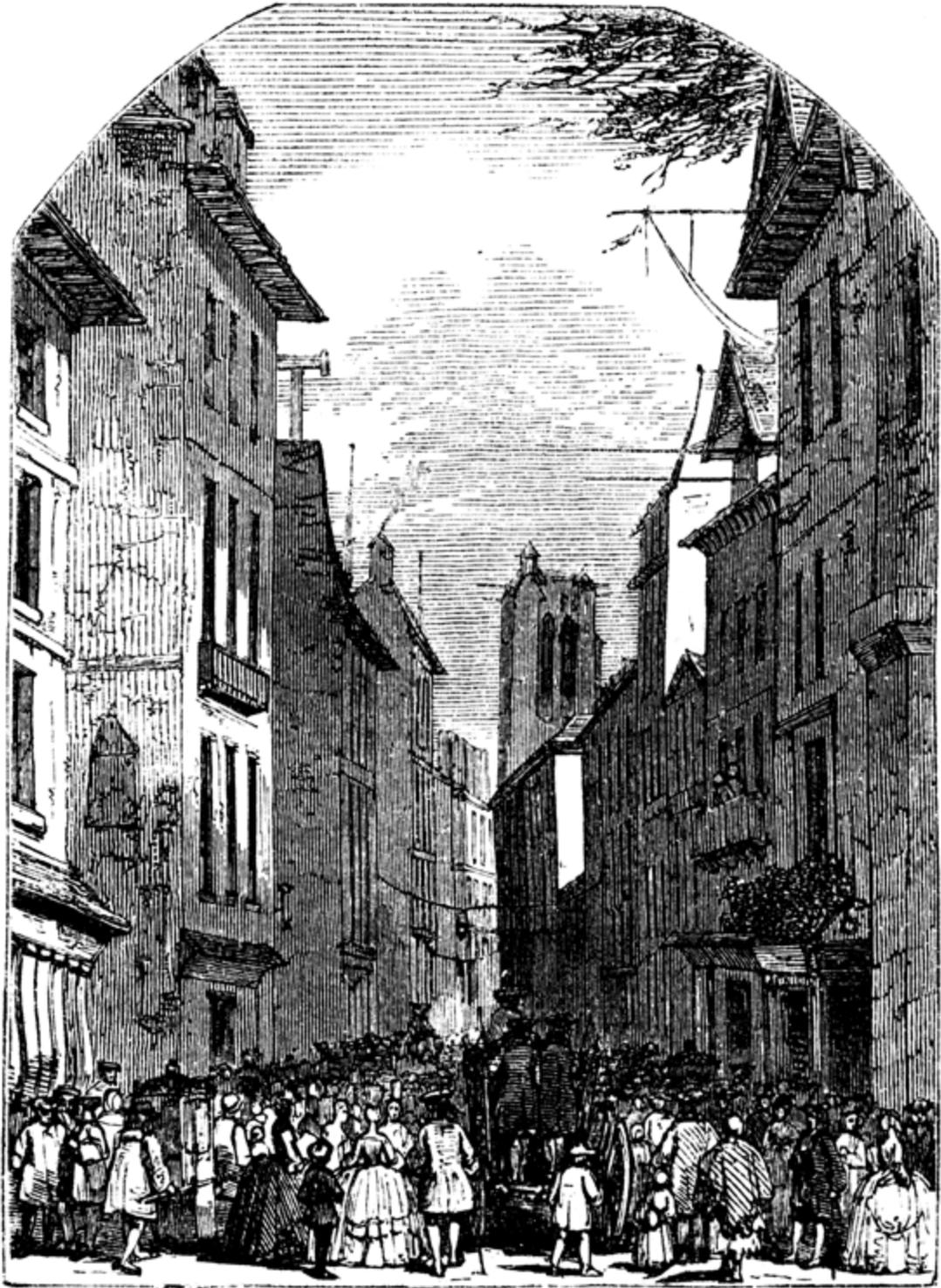
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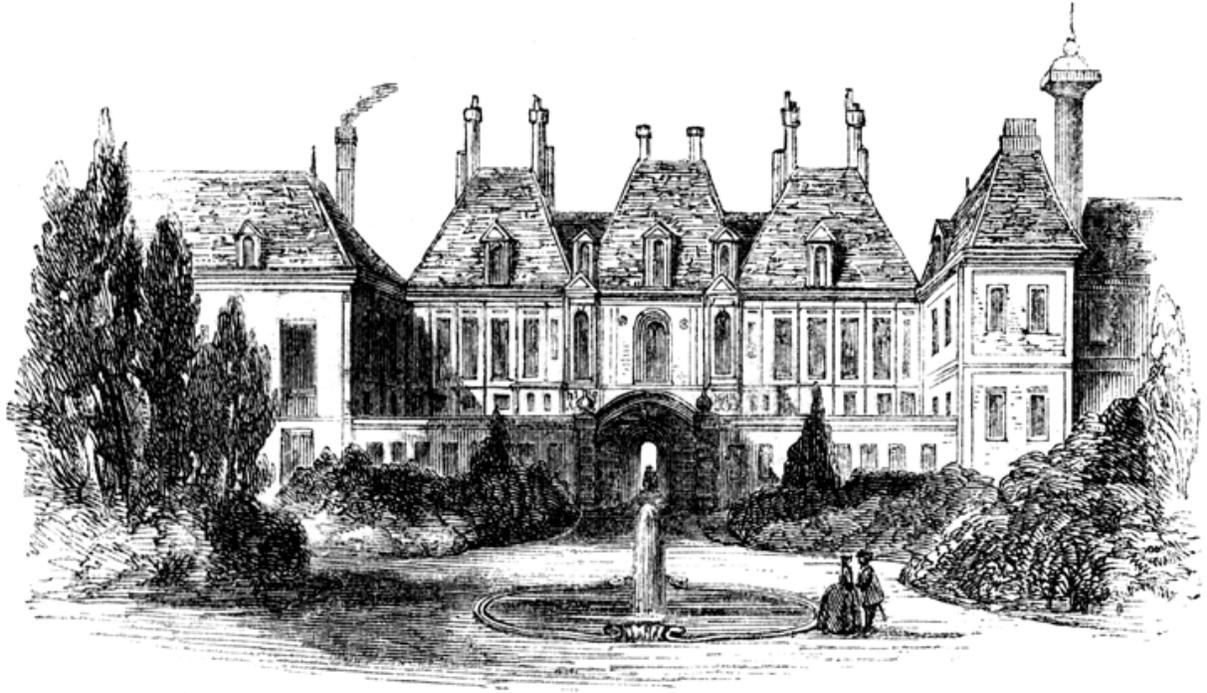
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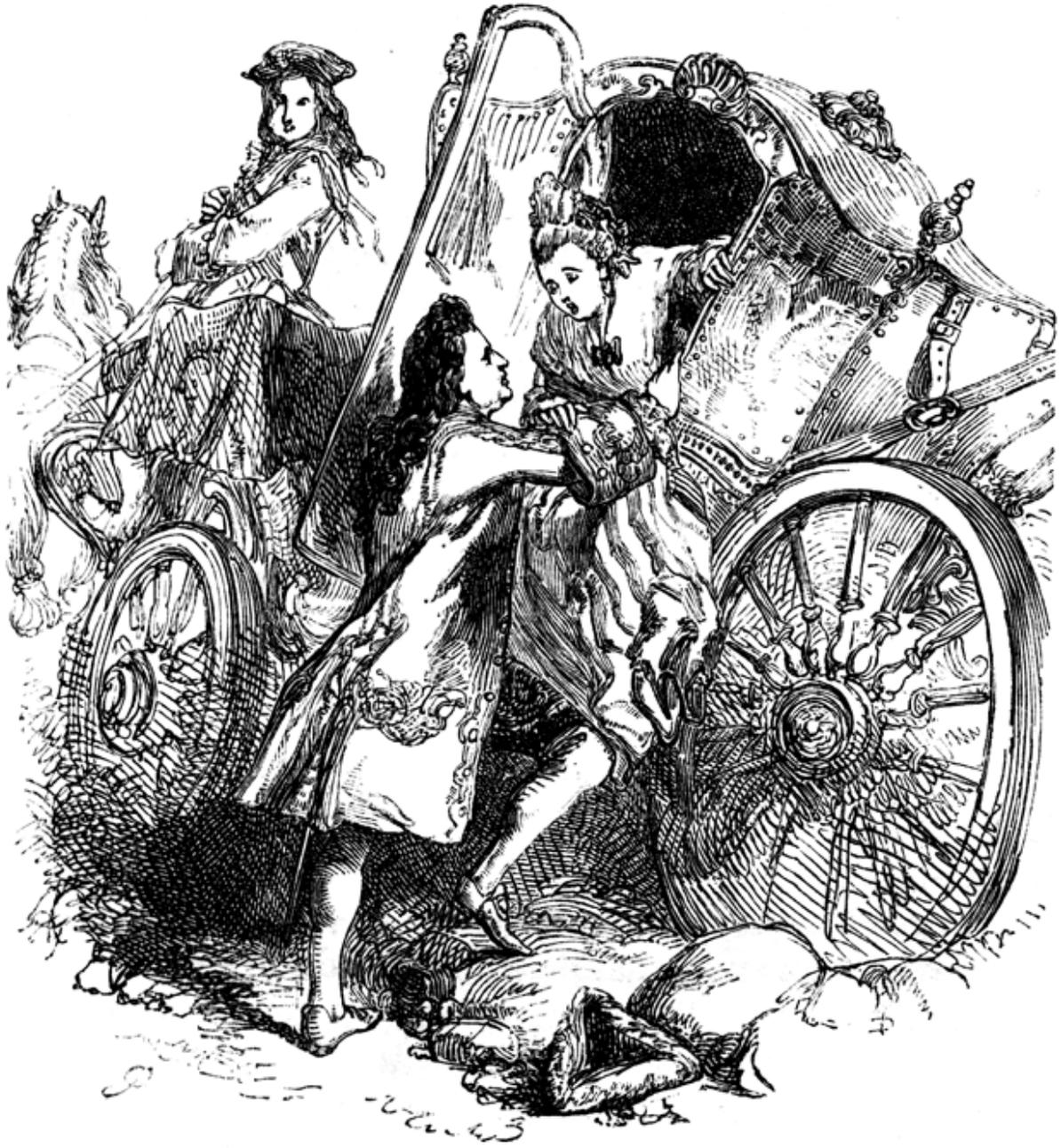
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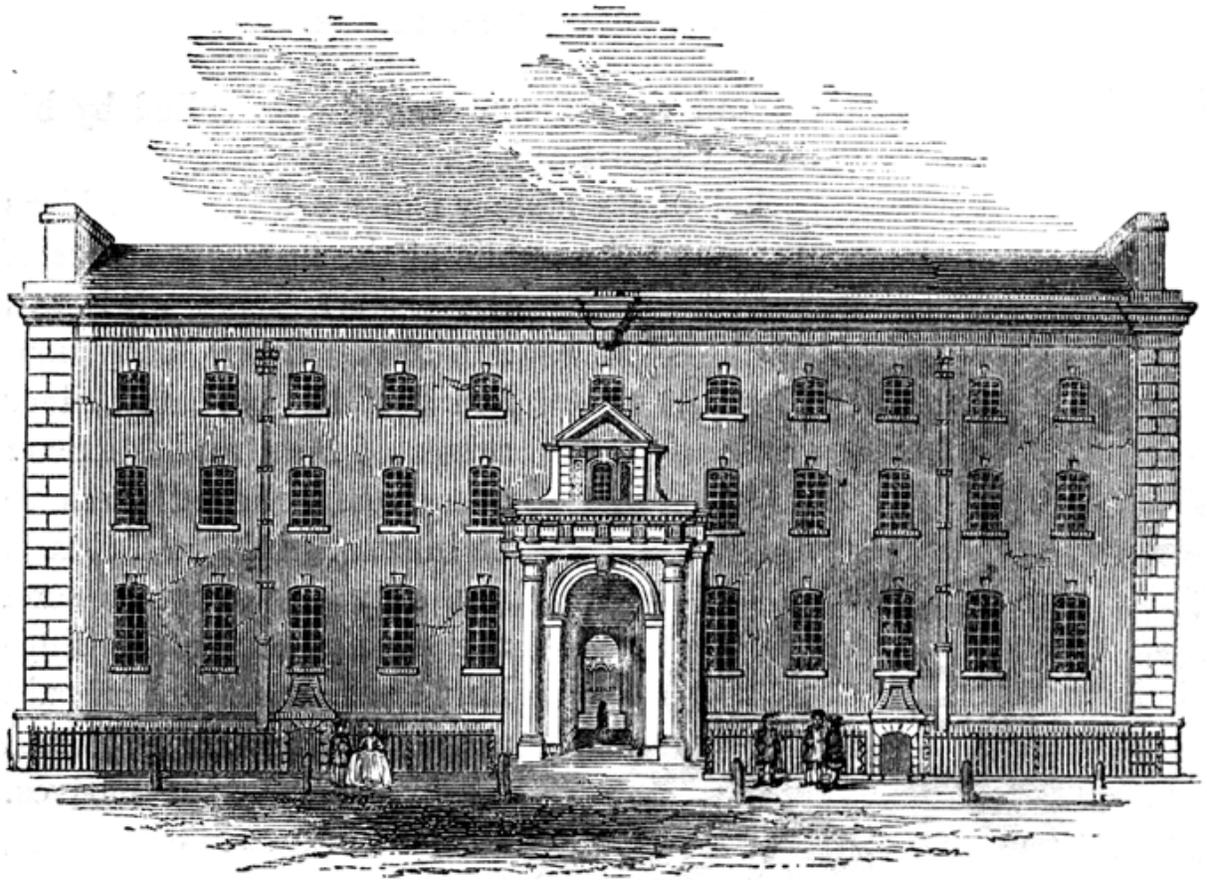
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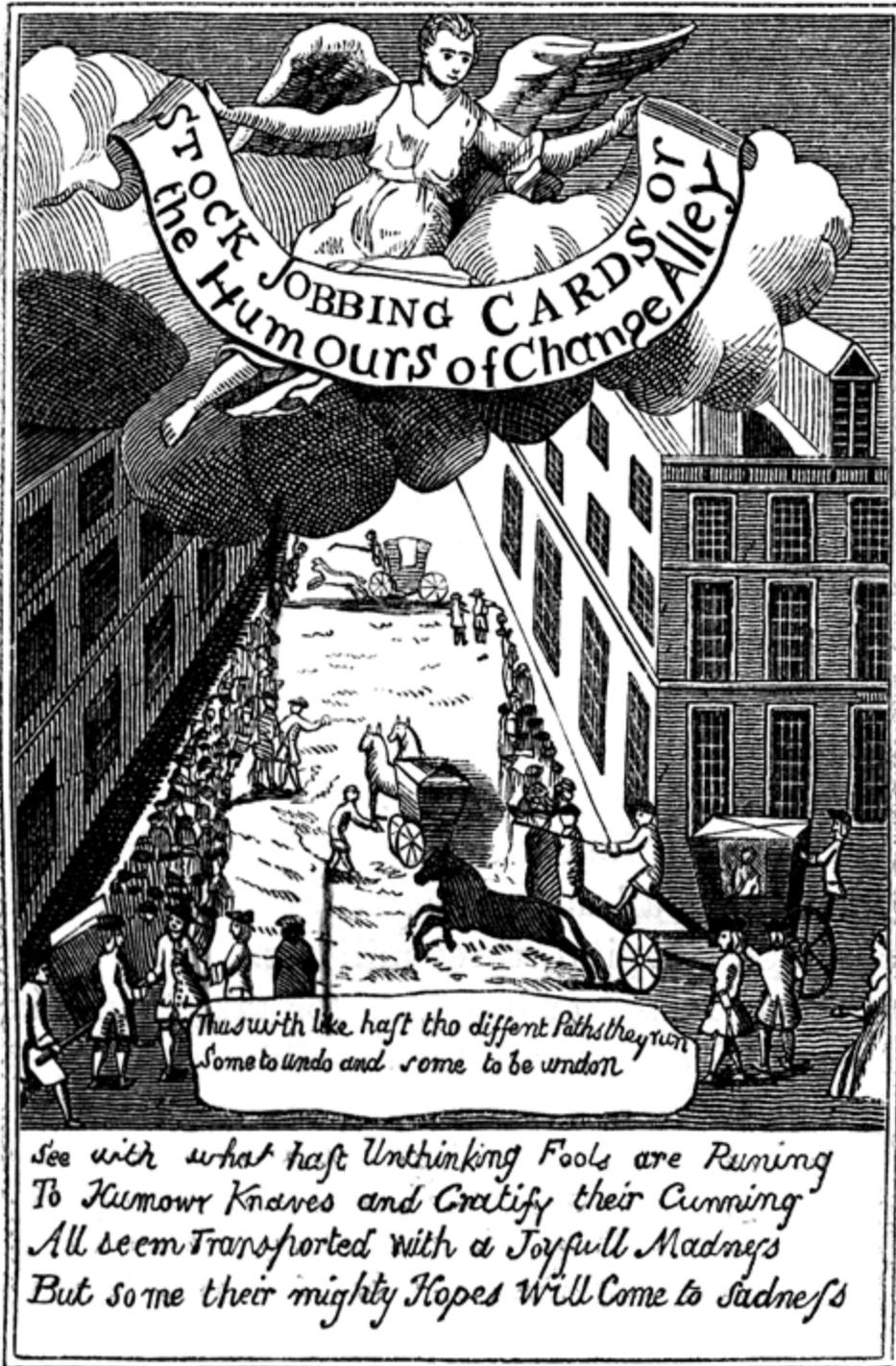
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BUBBLE CARDS



*The Headlong Fools Plunge into South Sea Water.
But the Sly Long-heads Wade with Caution a-ter.
The First are Drowning but the Wise Last—
Venture no Deeper than the Knees or Waist.*



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This evil Solomon espid
Among the Rabble rout
That beggers did on Horse back
Whilst Princes walke on foot^{ride}
South-Sea has verisy dy Same
For Mighty MEN of late
Are brought to Poverty & Shame
Whilst Scoundrels ride in state

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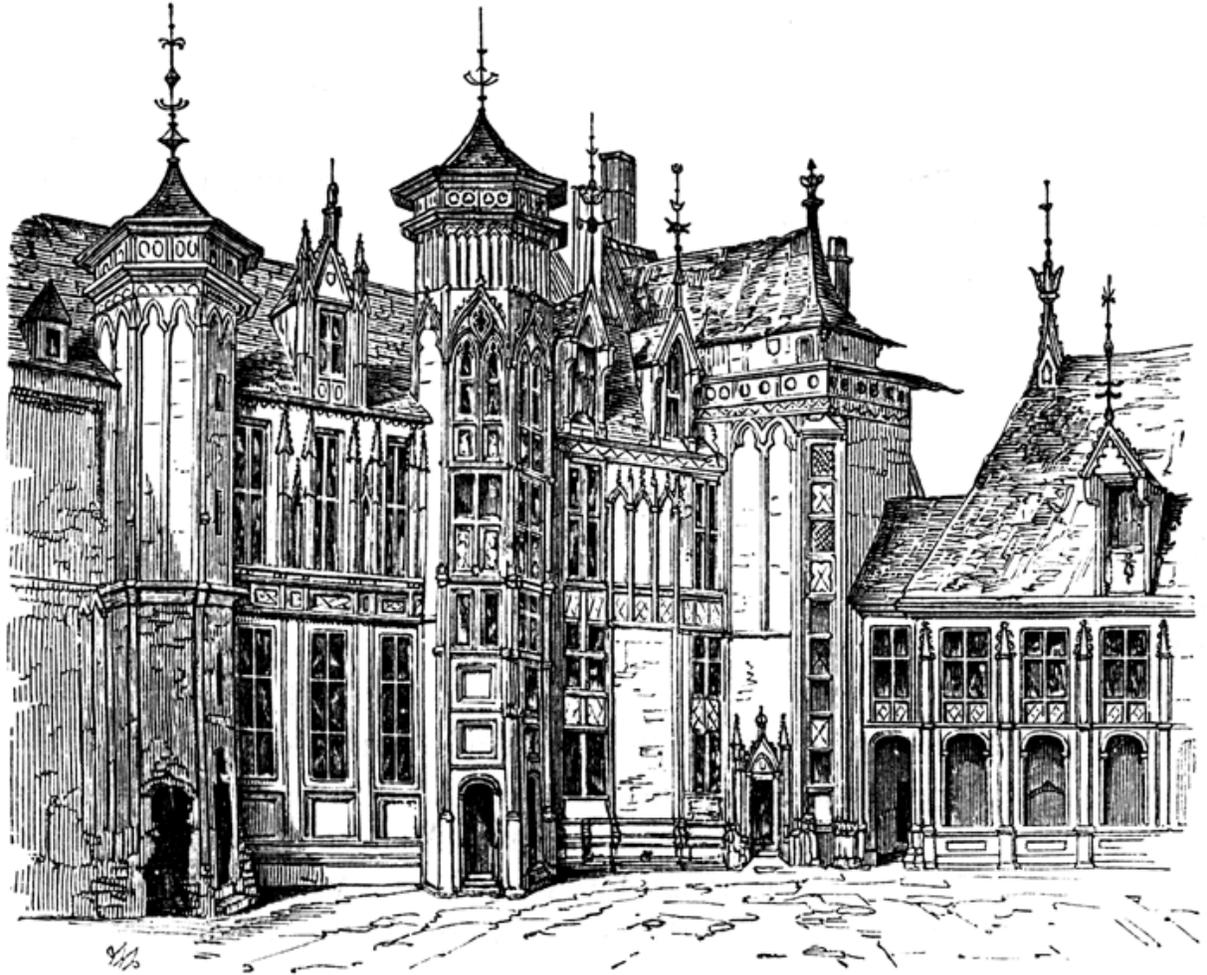
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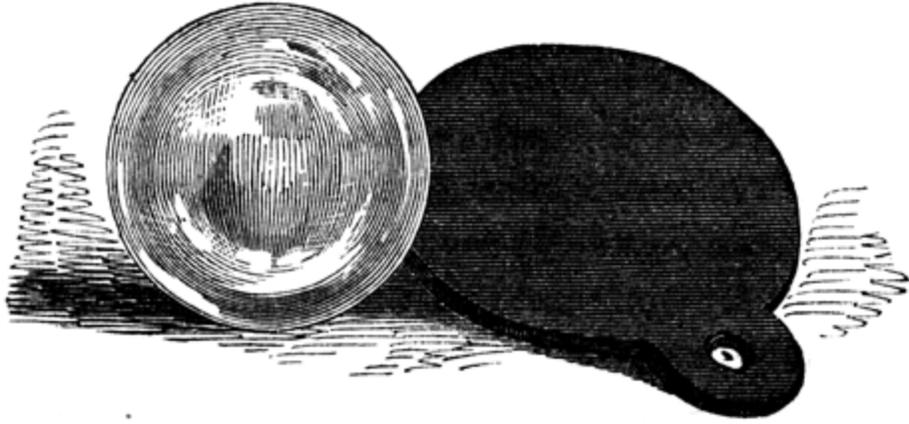
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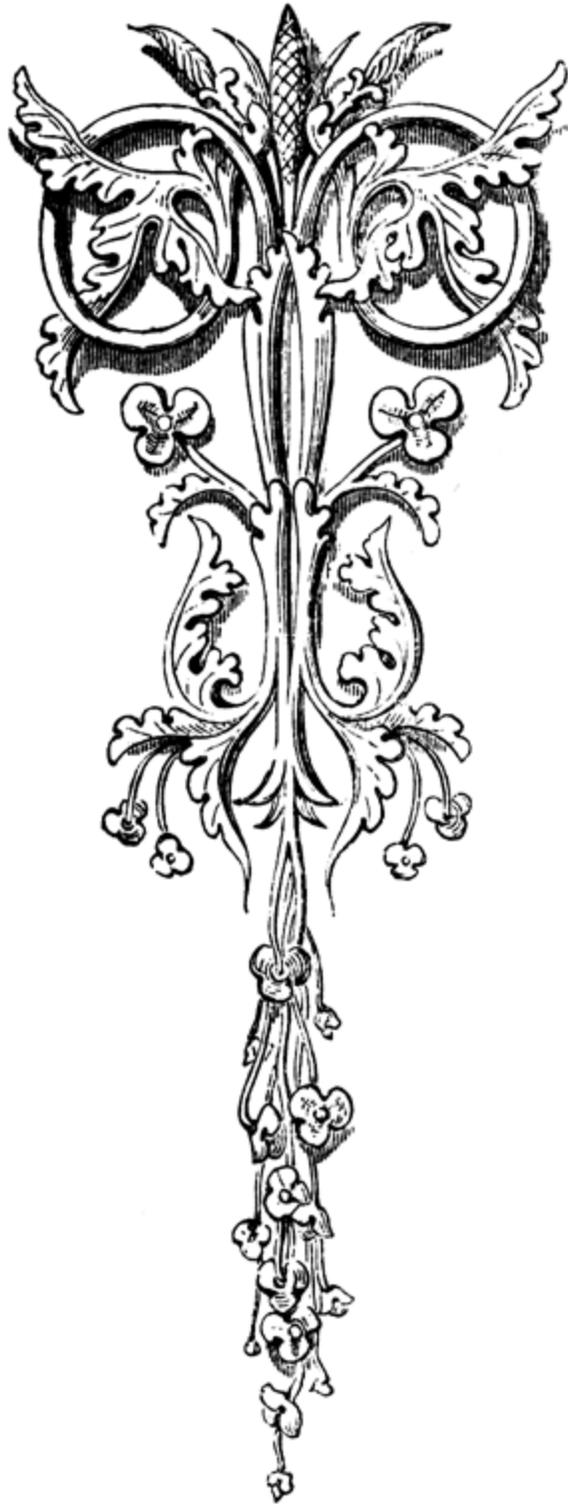
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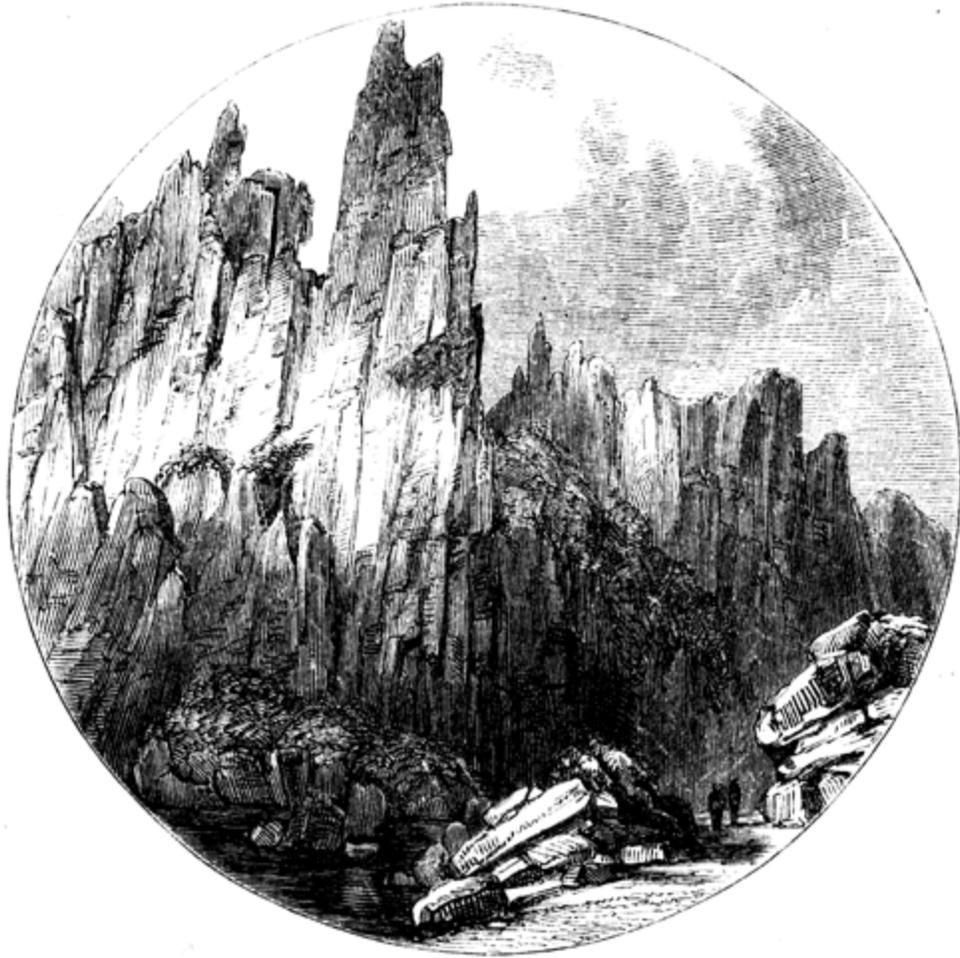
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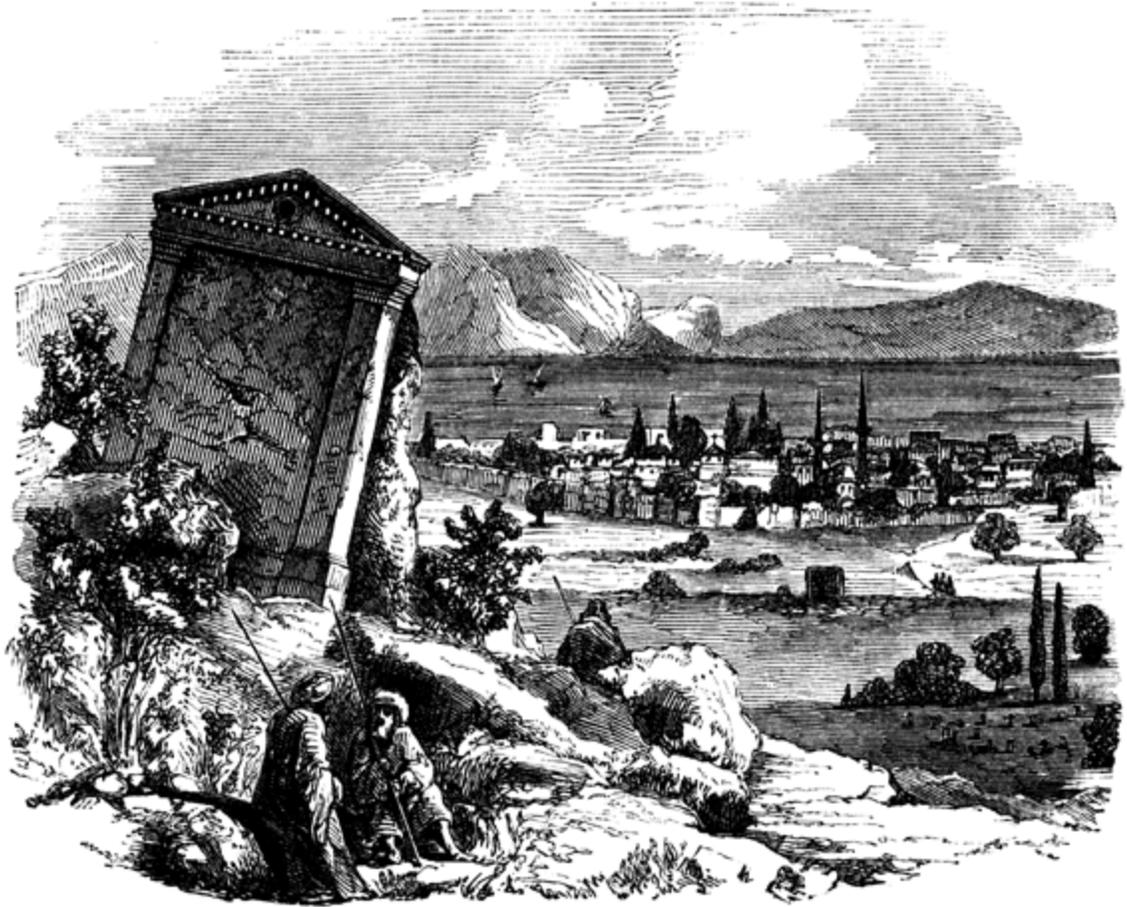
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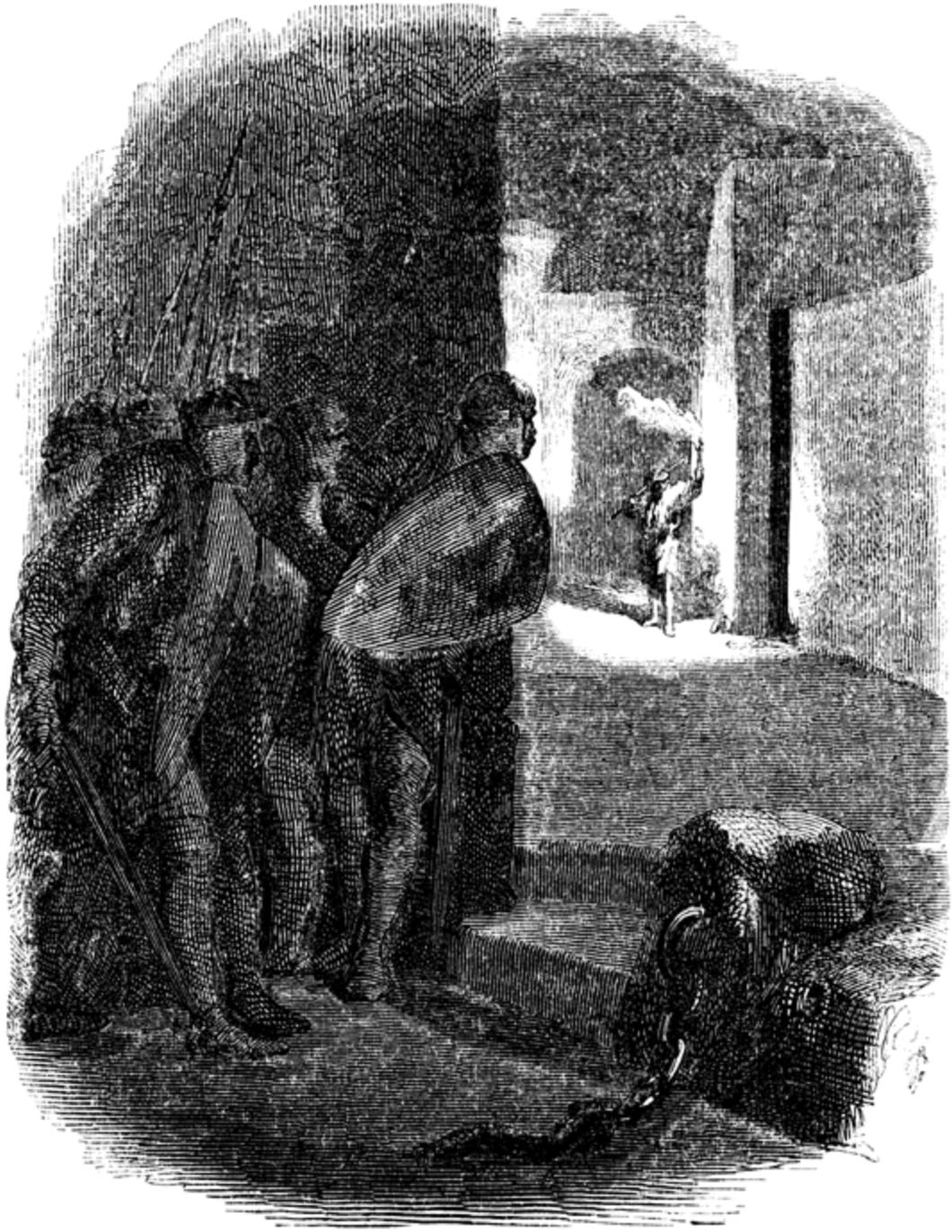
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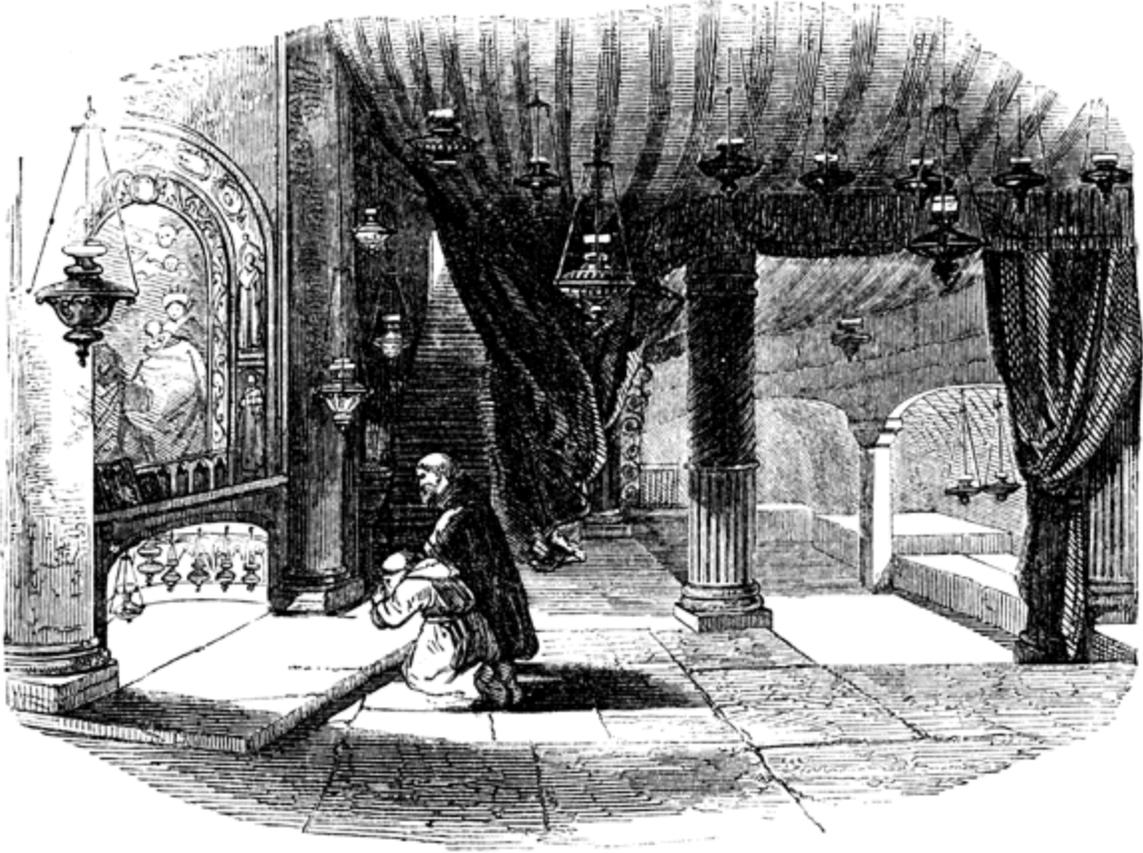
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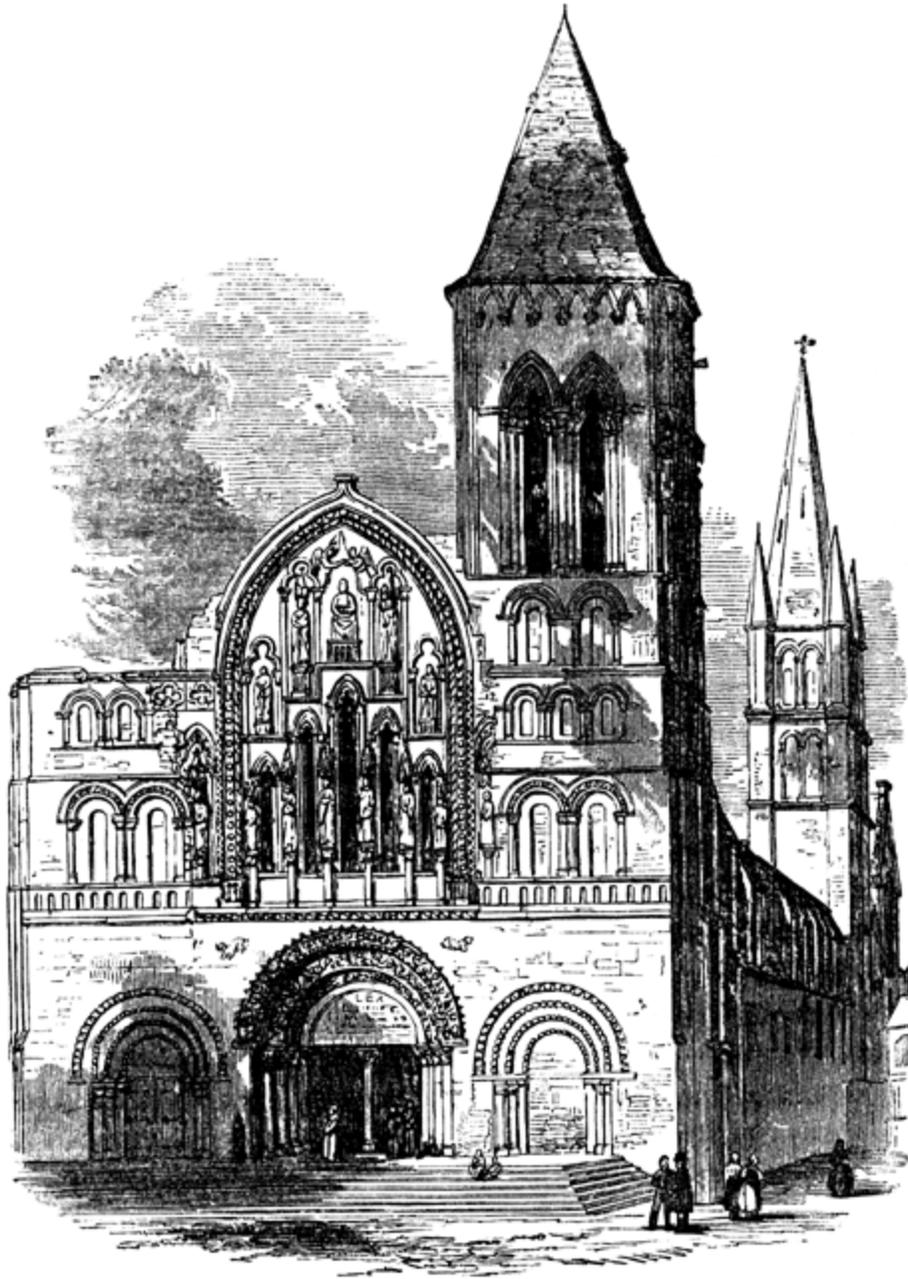
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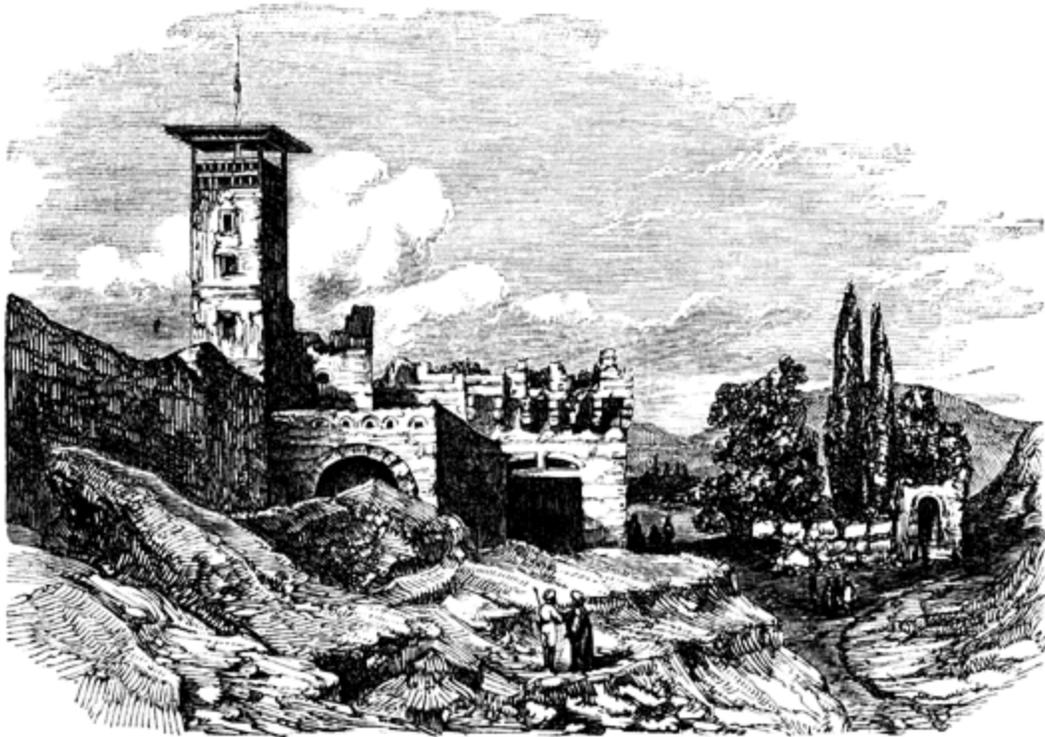
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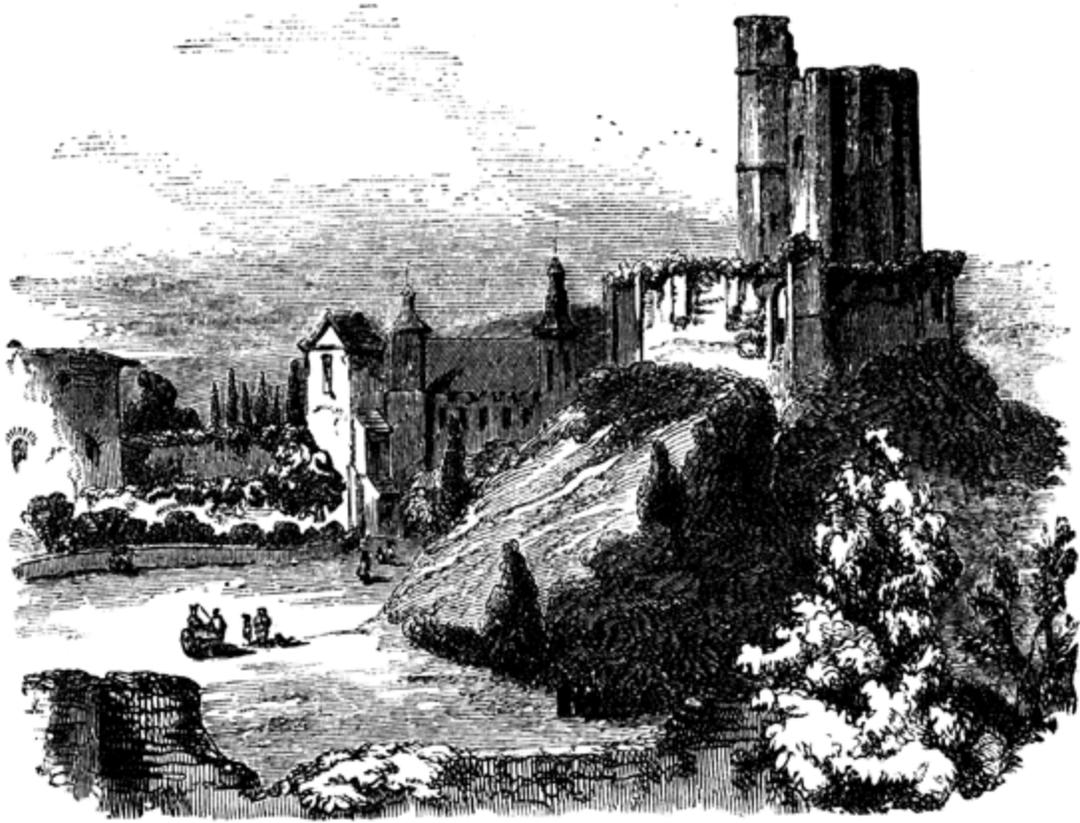
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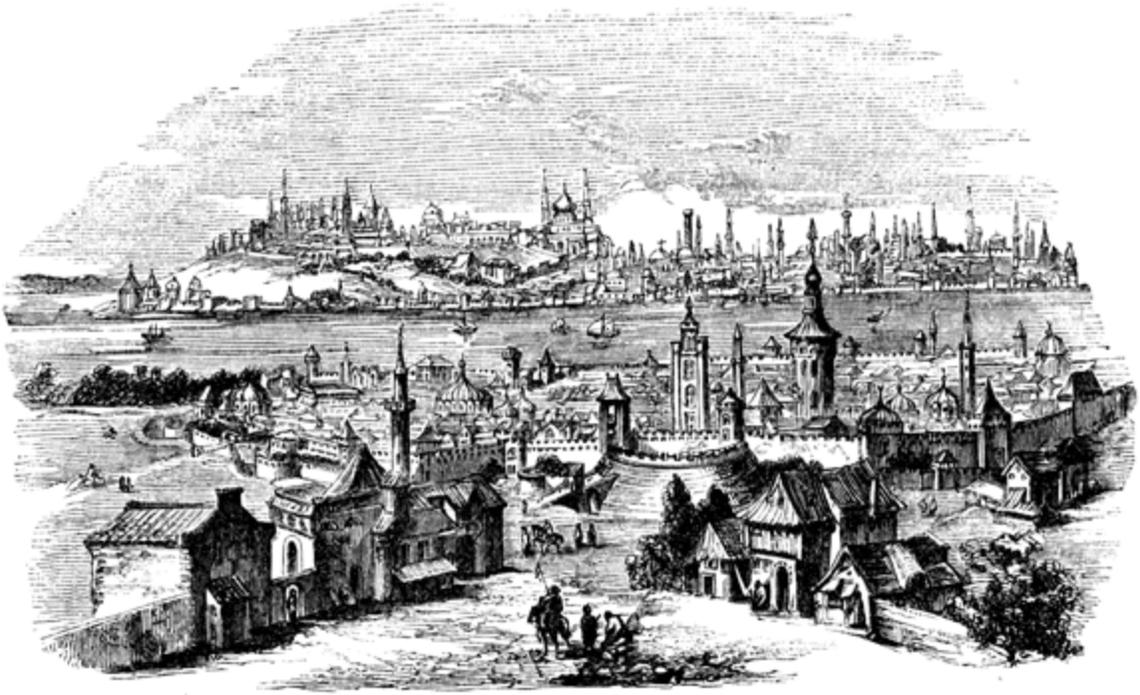
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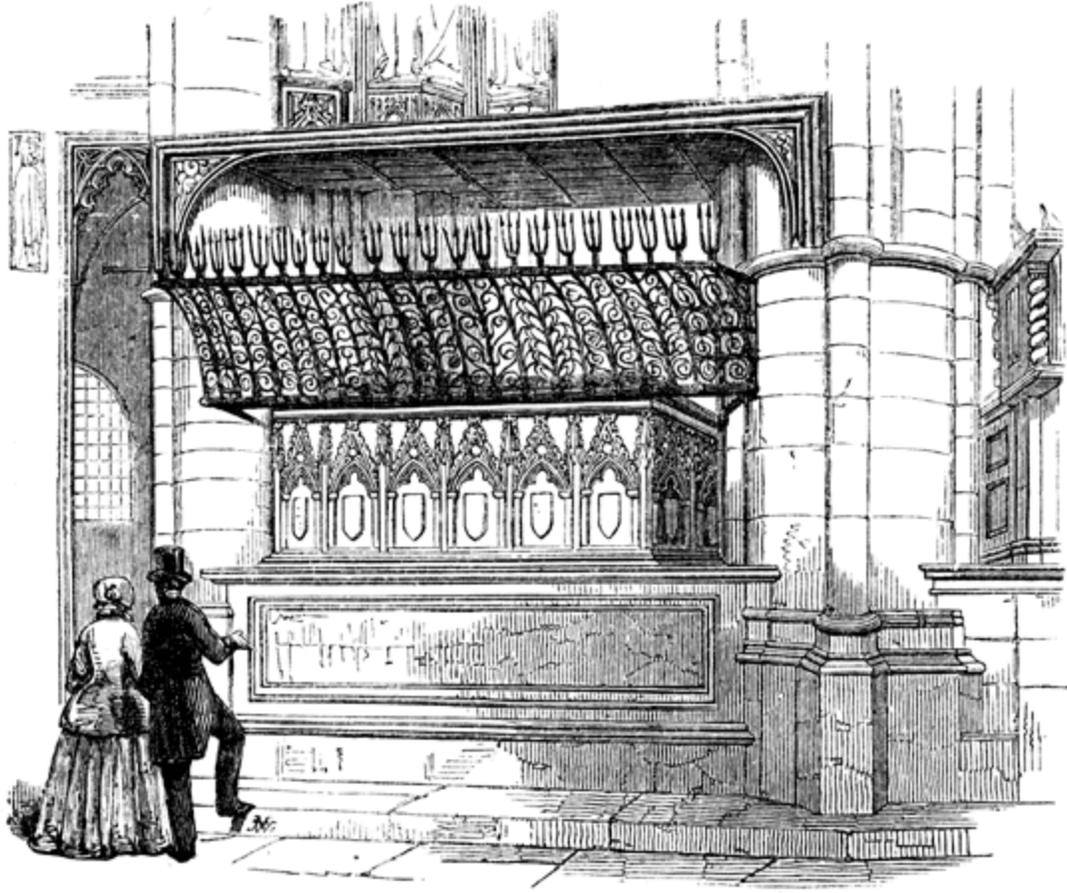
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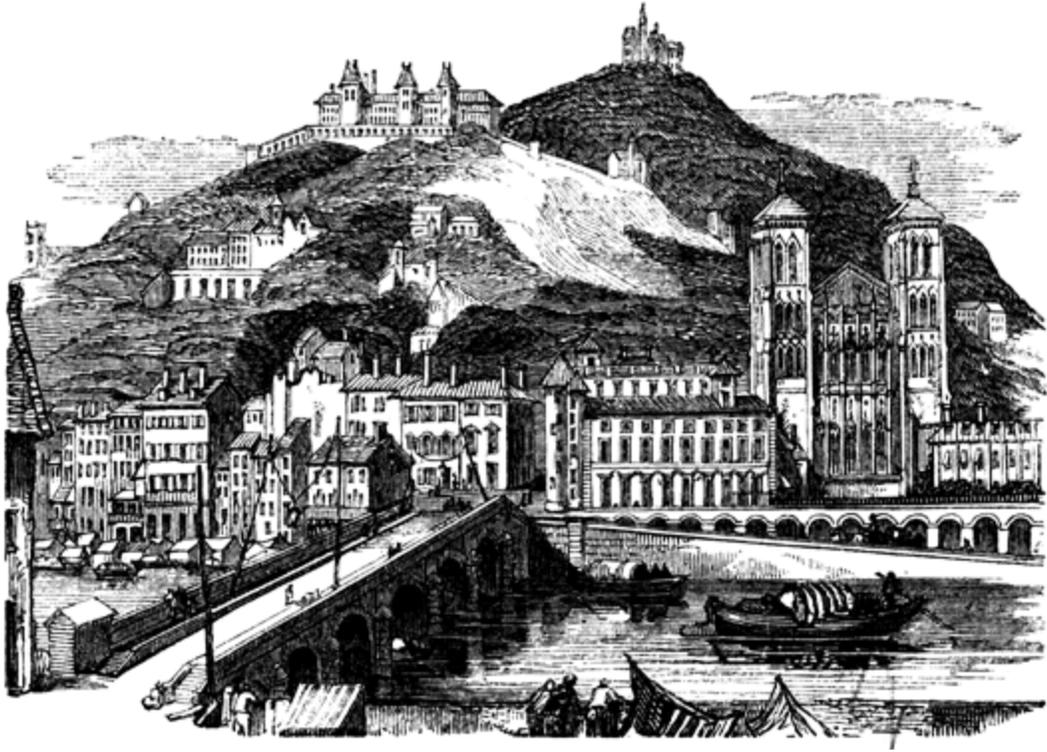
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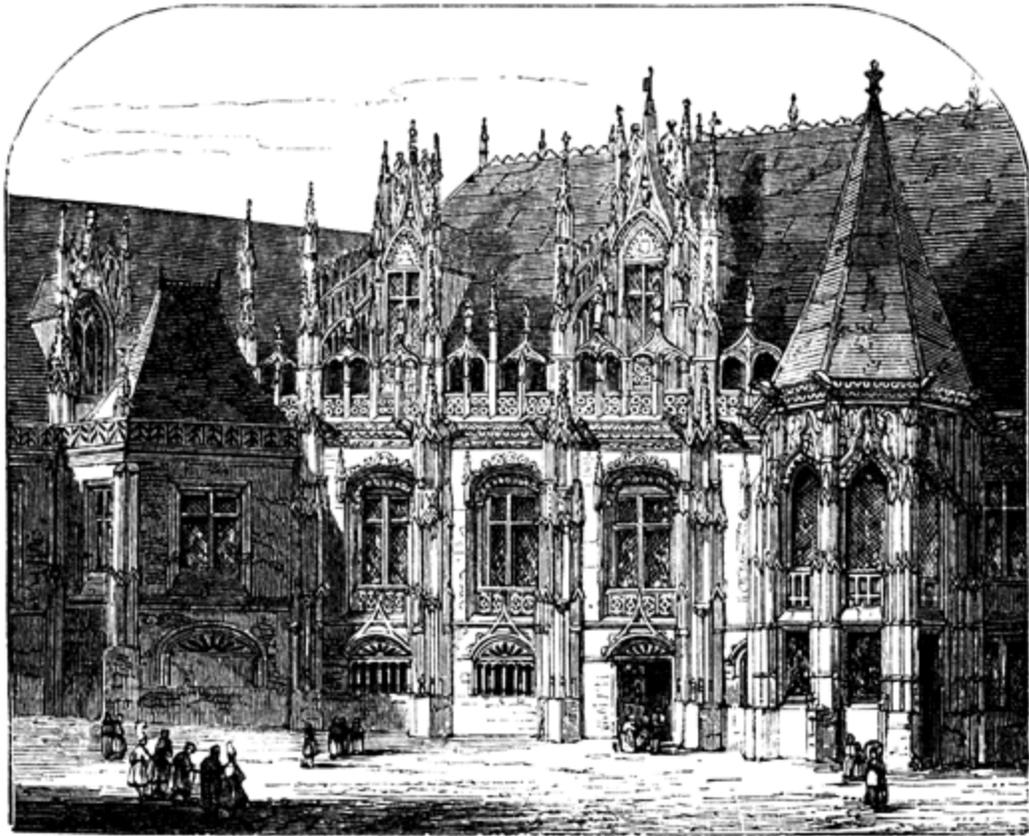
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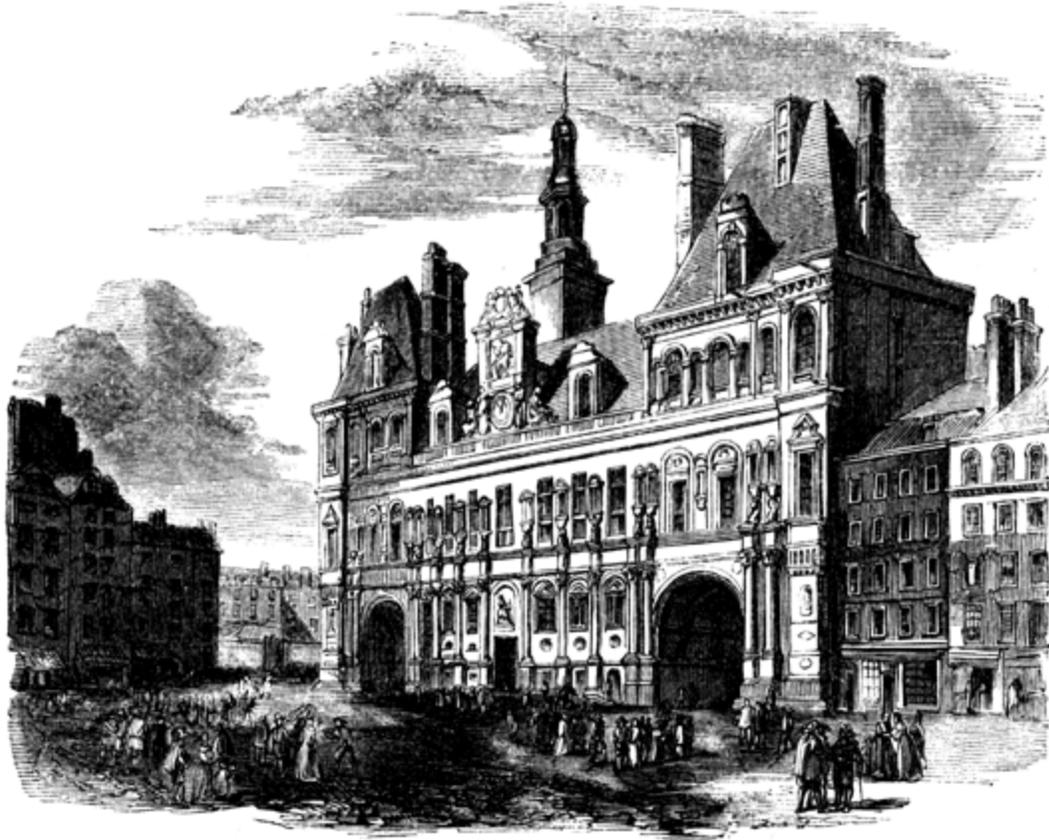
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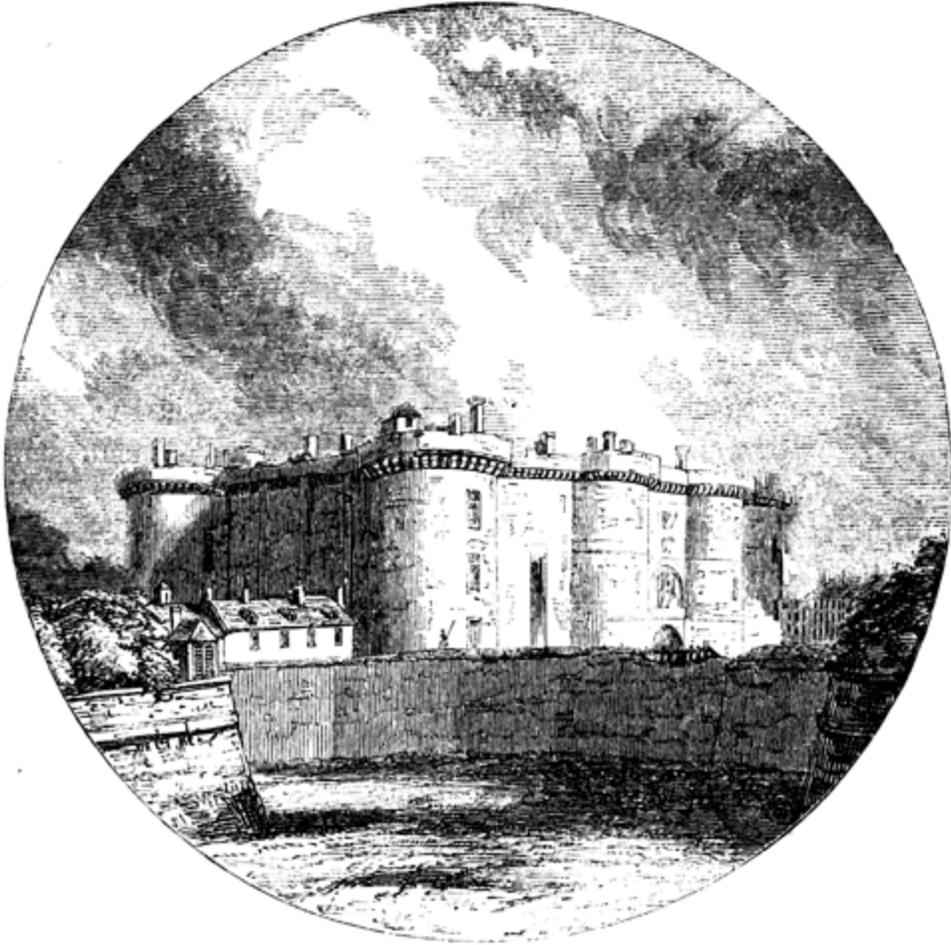
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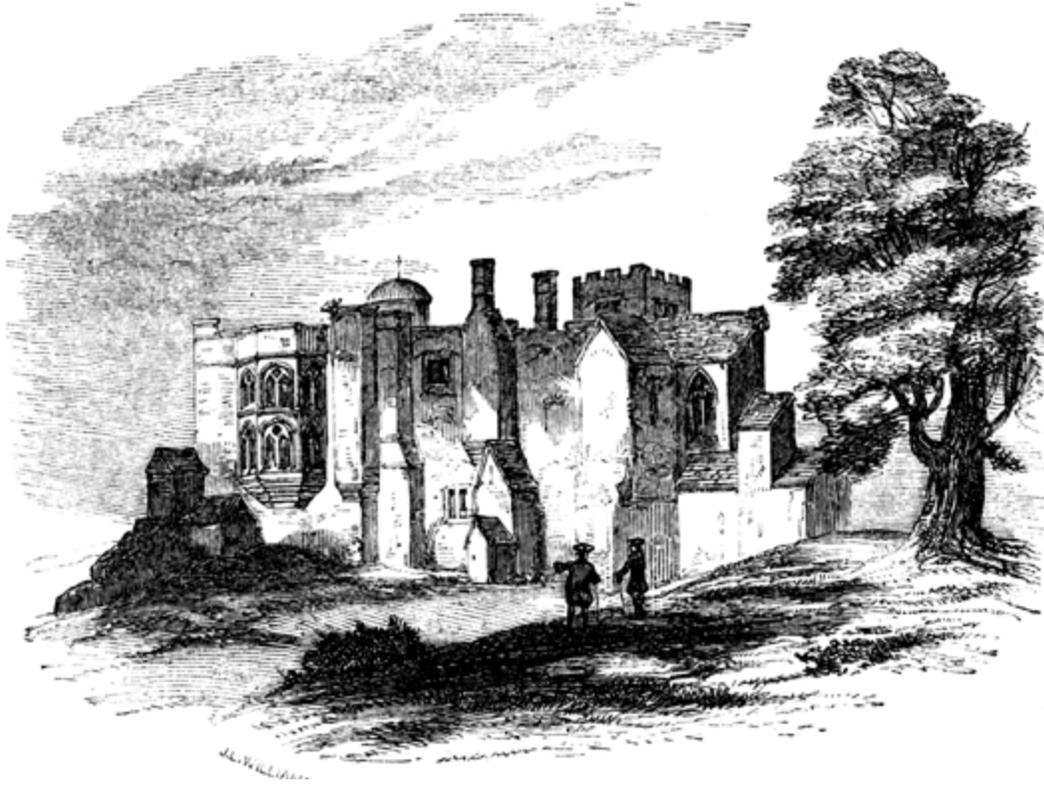
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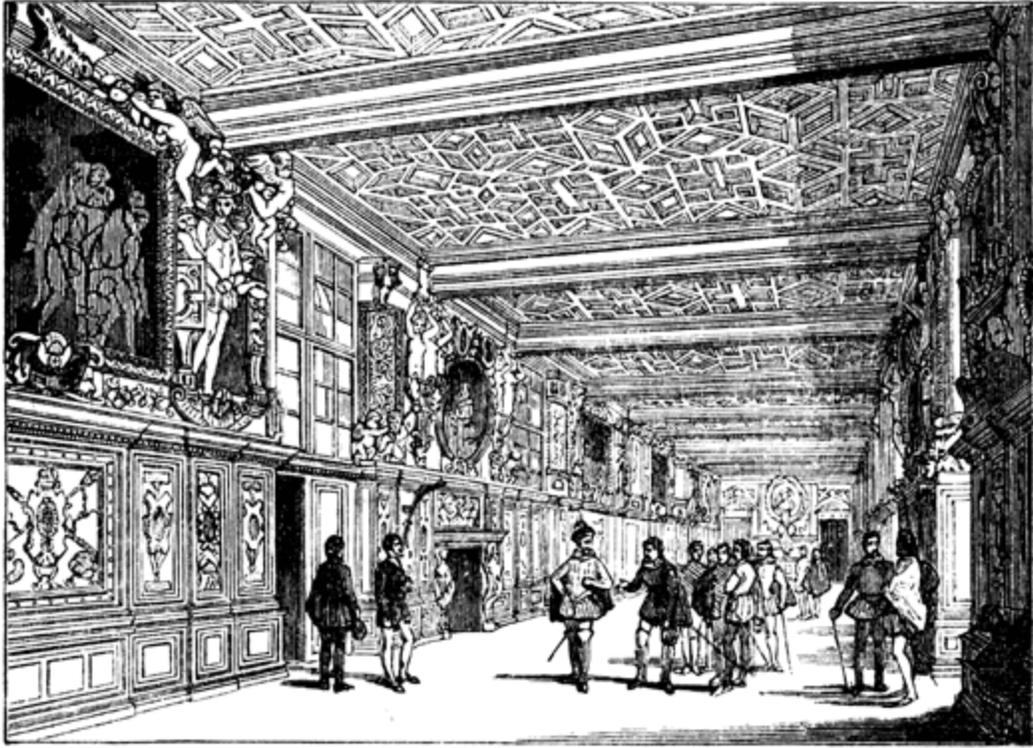
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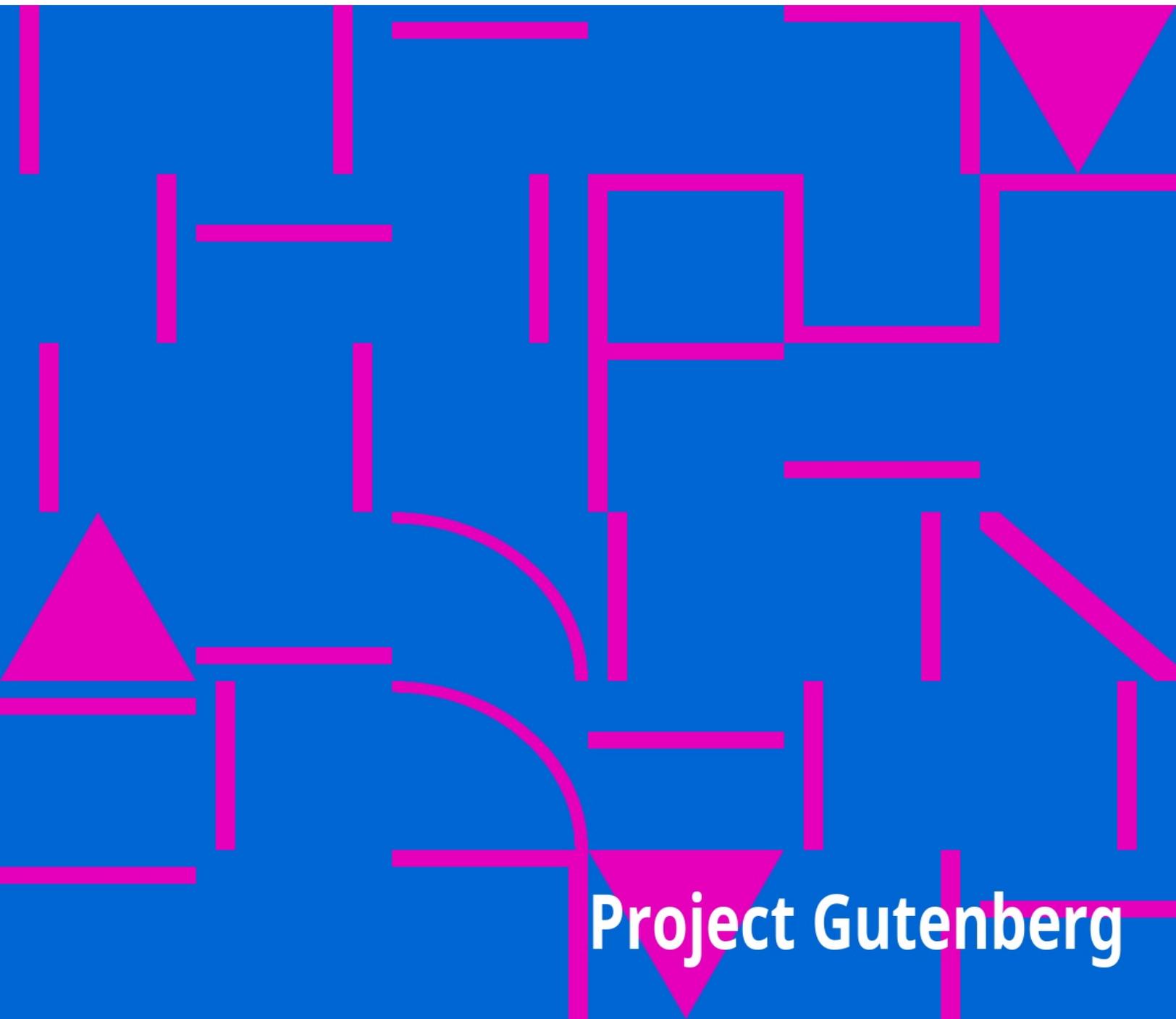
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The Psychology of Arithmetic

Edward L. Thorndike

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THE PSYCHOLOGY OF ARITHMETIC

BY

EDWARD L. THORNDIKE

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PREFACE

Within recent years there have been three lines of advance in psychology which are of notable significance for teaching. The first is the new point of view concerning the general process of learning. We now understand that learning is essentially the formation of connections or bonds between situations and responses, that the satisfyingness of the result is the chief force that forms them, and that habit rules in the realm of thought as truly and as fully as in the realm of action.

The second is the great increase in knowledge of the amount, rate, and conditions of improvement in those organized groups or hierarchies of habits which we call abilities, such as ability to add or ability to read. Practice and improvement are no longer vague generalities, but concern changes which are definable and measurable by standard tests and scales.

The third is the better understanding of the so-called "higher processes" of analysis, abstraction, the formation of general notions, and reasoning. The older view of a mental chemistry whereby sensations were compounded into percepts, percepts were duplicated by images, percepts and images were amalgamated into abstractions and concepts, and these were manipulated by reasoning, has given way to the understanding of the laws of response to elements or aspects of situations and to many situations or elements thereof in combination. James' view of reasoning as "selection of essentials" and "thinking things together" in a revised and clarified form has important applications in the teaching of all the school subjects.

This book presents the applications of this newer dynamic psychology to the teaching of arithmetic. Its contents are substantially what have been included in a course of lectures on the psychology of the elementary school subjects given by the author for some years to students of elementary education at Teachers College. Many of these former students, now in supervisory charge of elementary schools, have urged that these lectures be made available to teachers in general. So they are now published in spite of

the author's desire to clarify and reinforce certain matters by further researches.

A word of explanation is necessary concerning the exercises and problems cited to illustrate various matters, especially erroneous pedagogy. These are all genuine, having their source in actual textbooks, courses of study, state examinations, and the like. To avoid any possibility of invidious comparisons they are not quotations, but equivalent problems such as represent accurately the spirit and intent of the originals.

I take pleasure in acknowledging the courtesy of Mr. S. A. Curtis, Ginn and Company, D. C. Heath and Company, The Macmillan Company, The Oxford University Press, Rand, McNally and Company, Dr. C. W. Stone, The Teachers College Bureau of Publications, and The World Book Company, in permitting various quotations.

EDWARD L. THORNDIKE.

TEACHERS COLLEGE
COLUMBIA UNIVERSITY
April 1, 1920

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GENERAL INTRODUCTION

THE PSYCHOLOGY OF THE ELEMENTARY SCHOOL SUBJECTS

The psychology of the elementary school subjects is concerned with the connections whereby a child is able to respond to the sight of printed words by thoughts of their meanings, to the thought of "six and eight" by thinking "fourteen," to certain sorts of stories, poems, songs, and pictures by appreciation thereof, to certain situations by acts of skill, to certain others by acts of courtesy and justice, and so on and on through the series of situations and responses which are provided by the systematic training of the school subjects and the less systematic training of school life during their study. The aims of elementary education, when fully defined, will be found to be the production of changes in human nature represented by an almost countless list of connections or bonds whereby the pupil thinks or feels or acts in certain ways in response to the situations the school has organized and is influenced to think and feel and act similarly to similar situations when life outside of school confronts him with them.

We are not at present able to define the work of the elementary school in detail as the formation of such and such bonds between certain detached situations and certain specified responses. As elsewhere in human learning, we are at present forced to think somewhat vaguely in terms of mental functions, like "ability to read the vernacular," "ability to spell common words," "ability to add, subtract, multiply, and divide with integers," "knowledge of the history of the United States," "honesty in examinations," and "appreciation of good music," defined by some general results obtained rather than by the elementary bonds which constitute them.

The psychology of the school subjects begins where our common sense knowledge of these functions leaves off and tries to define the knowledge, interest, power, skill, or ideal in question more adequately, to measure improvement in it, to analyze it into its constituent bonds, to decide what bonds need to be formed and in what order as means to the most

economical attainment of the desired improvement, to survey the original tendencies and the tendencies already acquired before entrance to school which help or hinder progress in the elementary school subjects, to examine the motives that are or may be used to make the desired connections satisfying, to examine any other special conditions of improvement, and to note any facts concerning individual differences that are of special importance to the conduct of elementary school work.

Put in terms of problems, the task of the psychology of the elementary school subjects is, in each case:—

(1) *What is the function?* For example, just what is "ability to read"? Just what does "the understanding of decimal notation" mean? Just what are "the moral effects to be sought from the teaching of literature"?

(2) *How are degrees of ability or attainment, and degrees of progress or improvement in the function or a part of the function measured?* For example, how can we determine how well a pupil should write, or how hard words we expect him to spell, or what good taste we expect him to show? How can we define to ourselves what knowledge of the meaning of a fraction we shall try to secure in grade 4?

(3) *What can be done toward reducing the function to terms of particular situation-response connections, whose formation can be more surely and easily controlled?* For example, how far does ability to spell involve the formation one by one of bonds between the thought of almost every word in the language and the thought of that word's letters in their correct order; and how far does, say, the bond leading from the situation of the sound of *ceive* in *receive* and *deceive* to their correct spelling insure the correct spelling of that part of *perceive*? Does "ability to add" involve special bonds leading from "27 and 4" to "31," from "27 and 5" to "32," and "27 and 6" to "33"; or will the bonds leading from "7 and 4" to "11," "7 and 5" to "12" and "7 and 6" to "13" (each plus a simple inference) serve as well? What are the situations and responses that represent in actual behavior the quality that we call school patriotism?

(4) *In almost every case a certain desired change of knowledge or skill or power can be attained by any one of several sets of bonds. Which of them is the best? What are the advantages of each?* For example, learning to add

may include the bonds "0 and 0 are 0," "0 and 1 are 1," "0 and 2 are 2," "1 and 0 are 1," "2 and 0 are 2," etc.; or these may be all left unformed, the pupil being taught the habits of entering 0 as the sum of a column that is composed of zeros and otherwise neglecting 0 in addition. Are the rules of usage worth teaching as a means toward correct speech, or is the time better spent in detailed practice in correct speech itself?

(5) *A bond to be formed may be formed in any one of many degrees of strength. Which of these is, at any given stage of learning the subject, the most desirable, all things considered?* For example, shall the dates of all the early settlements of North America be learned so that the exact year will be remembered for ten years, or so that the exact date will be remembered for ten minutes and the date with an error plus or minus of ten years will be remembered for a year or two? Shall the tables of inches, feet, and yards, and pints, quarts, and gallons be learned at their first appearance so as to be remembered for a year, or shall they be learned only well enough to be usable in the work of that week, which in turn fixes them to last for a month or so? Should a pupil in the first year of study of French have such perfect connections between the sounds of French words and their meanings that he can understand simple sentences containing them spoken at an ordinary rate of speaking? Or is slow speech permissible, and even imperative, on the part of the teacher, with gradual increase of rate?

(6) *In almost every case, any set of bonds may produce the desired change when presented in any one of several orders. Which is the best order? What are the advantages of each?* Certain systems for teaching handwriting perfect the elementary movements one at a time and then teach their combination in words and sentences. Others begin and continue with the complex movement-series that actual words require. What do the latter lose and gain? The bonds constituting knowledge of the metric system are now formed late in the pupil's course. Would it be better if they were formed early as a means of facilitating knowledge of decimal fractions?

(7) *What are the original tendencies and pre-school acquisitions upon which the connection-forming of the elementary school may be based or which it has to counteract?* For example, if a pupil knows the meaning of a heard word, he may read it understandingly from getting its sound, as by phonic reconstruction. What words does the average beginner so know?

What are the individual differences in this respect? What do the instincts of gregariousness, attention-getting, approval, and helpfulness recommend concerning group-work *versus* individual-work, and concerning the size of a group that is most desirable? The original tendency of the eyes is certainly not to move along a line from left to right of a page, then back in one sweep and along the next line. What is their original tendency when confronted with the printed page, and what must we do with it in teaching reading?

(8) *What armament of satisfiers and annoyers, of positive and negative interests and motives, stands ready for use in the formation of the intrinsically uninteresting connections between black marks and meanings, numerical exercises and their answers, words and their spelling, and the like?* School practice has tried, more or less at random, incentives and deterrents from quasi-physical pain to the most sentimental fondling, from sheer cajolery to philosophical argument, from appeals to assumed savage and primitive traits to appeals to the interest in automobiles, flying-machines, and wireless telegraphy. Can not psychology give some rules for guidance, or at least limit experimentation to its more hopeful fields?

(9) *The general conditions of efficient learning are described in manuals of educational psychology. How do these apply in the case of each task of the elementary school?* For example, the arrangement of school drills in addition and in short division in the form of practice experiments has been found very effective in producing interest in the work and in improvement at it. In what other arithmetical functions may we expect the same?

(10) *Beside the general principles concerning the nature and causation of individual differences, there must obviously be, in existence or obtainable as a possible result of proper investigation, a great fund of knowledge of special differences relevant to the learning of reading, spelling, geography, arithmetic, and the like. What are the facts as far as known? What are the means of learning more of them?* Curtis finds that a child may be specially strong in addition and yet be specially weak in subtraction in comparison with others of his age and grade. It even seems that such subtle and intricate tendencies are inherited. How far is such specialization the rule? Is it, for example, the case that a child may have a special gift for spelling certain sorts of words, for drawing faces rather than flowers, for learning ancient history rather than modern?

Such are our problems: this volume discusses them in the case of arithmetic. The student who wishes to relate the discussion to the general pedagogy of arithmetic may profitably read, in connection with this volume: *The Teaching of Elementary Mathematics*, by D. E. Smith ['01], *The Teaching of Primary Arithmetic*, by H. Suzzallo ['11], *How to Teach Arithmetic*, by J. C. Brown and L. D. Coffman ['14], *The Teaching of Arithmetic*, by Paul Klapper ['16], and *The New Methods in Arithmetic*, by the author ['21].

**THE PSYCHOLOGY OF
ARITHMETIC**

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CHAPTER I

THE NATURE OF ARITHMETICAL ABILITIES

According to common sense, the task of the elementary school is to teach:—(1) the meanings of numbers, (2) the nature of our system of decimal notation, (3) the meanings of addition, subtraction, multiplication, and division, and (4) the nature and relations of certain common measures; to secure (5) the ability to add, subtract, multiply, and divide with integers, common and decimal fractions, and denominate numbers, (6) the ability to apply the knowledge and power represented by (1) to (5) in solving problems, and (7) certain specific abilities to solve problems concerning percentage, interest, and other common occurrences in business life.

This statement of the functions to be developed and improved is sound and useful so far as it goes, but it does not go far enough to make the task entirely clear. If teachers had nothing but the statement above as a guide to what changes they were to make in their pupils, they would often leave out important features of arithmetical training, and put in forms of training that a wise educational plan would not tolerate. It is also the case that different leaders in arithmetical teaching, though they might all subscribe to the general statement of the previous paragraph, certainly do not in practice have identical notions of what arithmetic should be for the elementary school pupil.

The ordinary view of the nature of arithmetical learning is obscure or inadequate in four respects. It does not define what 'knowledge of the meanings of numbers' is; it does not take account of the very large amount of teaching of *language* which is done and should be done as a part of the teaching of arithmetic; it does not distinguish between the ability to meet certain quantitative problems as life offers them and the ability to meet the problems provided by textbooks and courses of study; it leaves 'the ability to apply arithmetical knowledge and power' as a rather mystical general

faculty to be improved by some educational magic. The four necessary amendments may be discussed briefly.

KNOWLEDGE OF THE MEANINGS OF NUMBERS

Knowledge of the meanings of the numbers from one to ten may mean knowledge that 'one' means a single thing of the sort named, that two means one more than one, that three means one more than two, and so on. This we may call the *series* meaning. To know the meaning of 'six' in this sense is to know that it is one more than five and one less than seven—that it is between five and seven in the number series. Or we may mean by knowledge of the meanings of numbers, knowledge that two fits a collection of two units, that three fits a collection of three units, and so on, each number being a name for a certain sized collection of discrete things, such as apples, pennies, boys, balls, fingers, and the other customary objects of enumeration in the primary school. This we may call the *collection* meaning. To know the meaning of six in this sense is to be able to name correctly any collection of six separate, easily distinguishable individual objects. In the third place, knowledge of the numbers from one to ten may mean knowledge that two is twice whatever is called one, that three is three times whatever is one, and so on. This is, of course, the *ratio* meaning. To know the meaning of six in this sense is to know that if _____ is one, a line half a foot long is six, that if [] is one, [_____] is about six, while if [] is one, [_____] is about six, and the like. In the fourth place, the meaning of a number may be a smaller or larger fraction of its *implications*—its numerical relations, facts about it. To know six in this sense is to know that it is more than five or four, less than seven or eight, twice three, three times two, the sum of five and one, or of four and two, or of three and three, two less than eight—that with four it makes ten, that it is half of twelve, and the like. This we may call the '*nucleus of facts*' or *relational* meaning of a number.

Ordinary school practice has commonly accepted the second meaning as that which it is the task of the school to teach beginners, but each of the other meanings has been alleged to be the essential one—the series idea by Phillips ['97], the ratio idea by McLellan and Dewey ['95] and Speer ['97], and the relational idea by Grube and his followers.

This diversity of views concerning what the function is that is to be improved in the case of learning the meanings of the numbers one to ten is not a trifling matter of definition, but produces very great differences in school practice. Consider, for example, the predominant value assigned to counting by Phillips in the passage quoted below, and the samples of the sort of work at which children were kept employed for months by too ardent followers of Speer and Grube.

THE SERIES IDEA OVEREMPHASIZED

"This is essentially the counting period, and any words that can be arranged into a series furnish all that is necessary. Counting is fundamental, and counting that is spontaneous, free from sensible observation, and from the strain of reason. A study of these original methods shows that multiplication was developed out of counting, and not from addition as nearly all textbooks treat it. Multiplication is counting. When children count by 4's, etc., they accent the same as counting gymnastics or music. When a child now counts on its fingers it simply reproduces a stage in the growth of the civilization of all nations.

I would emphasize again that during the counting period there is a somewhat spontaneous development of the number series-idea which Preyer has discussed in his *Arithmogenezis*; that an immense momentum is given by a systematic series of names; and that these names are generally first learned and applied to objects later. A lady teacher told me that the Superintendent did not wish the teachers to allow the children to count on their fingers, but she failed to see why counting with horse-chestnuts was any better. Her children could hardly avoid using their fingers in counting other objects yet they followed the series to 100 without hesitation or reference to their fingers. This spontaneous counting period, or naming and following the series, should precede its application to objects." [D.E. Phillips, '97, p. 238.]

THE RATIO IDEA OVEREMPHASIZED

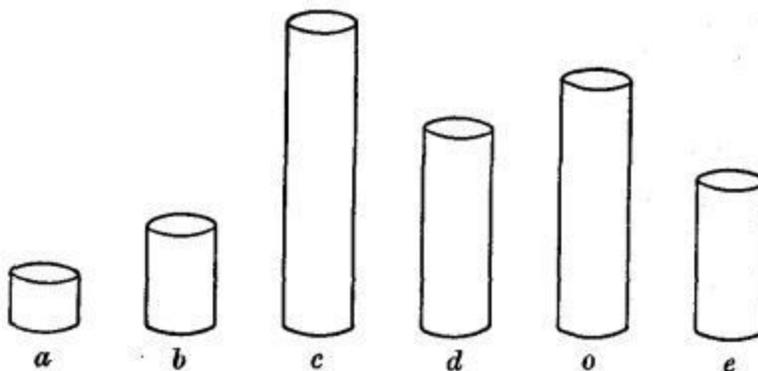


FIG. 1.

"Ratios.—1. Select solids having the relation, or ratio, of a, b, c, d, o, e .

2. Name the solids, a, b, c, d, o, e .

The means of expressing must be as freely supplied as the means of discovery. The pupil is not expected to invent terms.

3. Tell all you can about the relation of these units.

4. Unite units and tell what the sum equals.

5. Make statements like this: o less e equals b .

6. c can be separated into how many d 's? into how many b 's?

7. c can be separated into how many b 's? What is the name of the largest unit that can be found in both c and d an exact number of times?

8. Each of the other units equals what part of c ?

9. If b is 1, what is each of the other units?

10. If a is 1, what is each of the other units?

11. If b is 1, how many 1's are there in each of the other units?

12. If d is 1, how many 1's and parts of 1 in each of the other units?

13. 2 is the relation of what units?

14. 3 is the relation of what units?

15. $\frac{1}{2}$ is the relation of what units?

16. $\frac{2}{3}$ is the relation of what units?

17. Which units have the relation $\frac{3}{2}$?

18. Which unit is 3 times as large as $\frac{1}{2}$ of b ?

19. c equals 6 times $\frac{1}{3}$ of what unit?

20. $\frac{1}{3}$ of what unit equals $\frac{1}{6}$ of c ?

21. What equals $\frac{1}{2}$ of c ? d equals how many sixths of c ?

22. o equals 5 times $\frac{1}{3}$ of what unit?

23. $\frac{1}{3}$ of what unit equals $\frac{1}{5}$ of o ?

24. $\frac{2}{3}$ of d equals what unit? b equals how many thirds of d ?

25. 2 is the ratio of d to $\frac{1}{3}$ of what unit? 3 is the ratio of d to $\frac{1}{2}$ of what unit?

26. d equals $\frac{3}{4}$ of what unit? $\frac{3}{4}$ is the ratio of what units?" [Speer, '97, p. 9f.]

THE RELATIONAL IDEA OVEREMPHASIZED

An inspection of books of the eighties which followed the "Grube method" (for example, the *New Elementary Arithmetic* by E.E. White ['83]) will show undue emphasis on the relational ideas. There will be over a hundred and fifty successive tasks all, or nearly all, on + 7 and - 7. There will be much written work of the sort shown below:

Add:

4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	4	4
4	1	2
_____	_____	_____

which must have sorely tried the eyes of all concerned. Pupils are taught to "give the analysis and synthesis of each of the nine digits." Yet the author states that he does not carry the principle of the Grube method "to the extreme of useless repetition and mechanism."

It should be obvious that all four meanings have claims upon the attention of the elementary school. Four is the thing between three and five

in the number series; it is the name for a certain sized collection of discrete objects; it is also the name for a continuous magnitude equal to four units—for four quarts of milk in a gallon pail as truly as for four separate quart-pails of milk; it is also, if we know it well, the thing got by adding one to three or subtracting six from ten or taking two two's or half of eight. To know the meaning of a number means to know somewhat about it in all of these respects. The difficulty has been the narrow vision of the extremists. A child must not be left interminably counting; in fact the one-more-ness of the number series can almost be had as a by-product. A child must not be restricted to exercises with collections objectified as in Fig. 2 or stated in words as so many apples, oranges, hats, pens, etc., when work with measurement of continuous quantities with varying units—inches, feet, yards, glassfuls, pints, quarts, seconds, minutes, hours, and the like—is so easy and so significant. On the other hand, the elaboration of artificial problems with fictitious units of measure just to have relative magnitudes as in the exercises on page 5 is a wasteful sacrifice. Similarly, special drills emphasizing the fact that eighteen is eleven and seven, twelve and six, three less than twenty-one, and the like, are simply idolatrous; these facts about eighteen, so far as they are needed, are better learned in the course of actual column-addition and -subtraction.

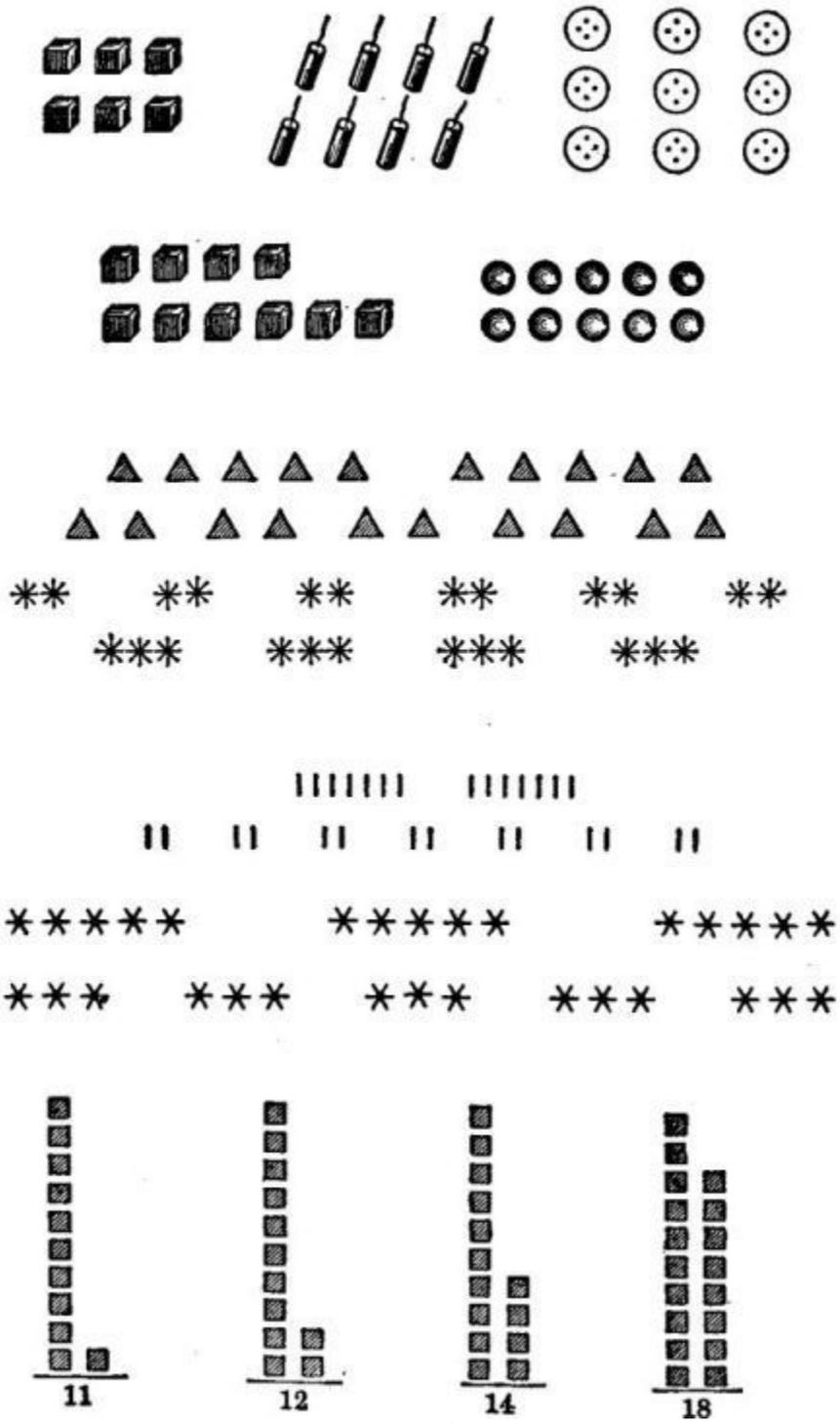


FIG. 2.

ARITHMETICAL LANGUAGE

The second improvement to be made in the ordinary notion of what the functions to be improved are in the case of arithmetic is to include among these functions the knowledge of certain words. The understanding of such words as *both, all, in all, together, less, difference, sum, whole, part, equal, buy, sell, have left, measure, is contained in*, and the like, is necessary in arithmetic as truly as is the understanding of numbers themselves. It must be provided for by the school; for pre-school and extra-school training does not furnish it, or furnishes it too late. It can be provided for much better in connection with the teaching of arithmetic than in connection with the teaching of English.

It has not been provided for. An examination of the first fifty pages of eight recent textbooks for beginners in arithmetic reveals very slight attention to this matter at the best and no attention at all in some cases. Three of the books do not even use the word *sum*, and one uses it only once in the fifty pages. In all the four hundred pages the word *difference* occurs only twenty times. When the words are used, no great ingenuity or care appears in the means of making sure that their meanings are understood.

The chief reason why it has not been provided for is precisely that the common notion of what the functions are that arithmetic is to develop has left out of account this function of intelligent response to quantitative terms, other than the names of the numbers and processes.

Knowledge of language over a much wider range is a necessary element in arithmetical ability in so far as the latter includes ability to solve verbally stated problems. As arithmetic is now taught, it does include that ability, and a large part of the time of wise teaching is given to improving the function 'knowing what a problem states and what it asks for.' Since, however, this understanding of verbally stated problems may not be an absolutely necessary element of arithmetic, it is best to defer its consideration until we have seen what the general function of problem-solving is.

PROBLEM-SOLVING

The third respect in which the function, 'ability in arithmetic,' needs clearer definition, is this 'problem-solving.' The aim of the elementary

school is to provide for correct and economical response to genuine problems, such as knowing the total due for certain real quantities at certain real prices, knowing the correct change to give or get, keeping household accounts, calculating wages due, computing areas, percentages, and discounts, estimating quantities needed of certain materials to make certain household or shop products, and the like. Life brings these problems usually either with a real situation (as when one buys and counts the cost and his change), or with a situation that one imagines or describes to himself (as when one figures out how much money he must save per week to be able to buy a forty-dollar bicycle before a certain date). Sometimes, however, the problem is described in words to the person who must solve it by another person (as when a life insurance agent says, 'You pay only 25 cents a week from now till—and you get \$250 then'; or when an employer says, 'Your wages would be 9 dollars a week, with luncheon furnished and bonuses of such and such amounts'). Sometimes also the problem is described in printed or written words to the person who must solve it (as in an advertisement or in the letter of a customer asking for an estimate on this or that). The problem may be in part real, in part imagined or described to oneself, and in part described to one orally or in printed or written words (as when the proposed articles for purchase lie before one, the amount of money one has in the bank is imagined, the shopkeeper offers 10 percent discount, and the printed price list is there to be read).

To fit pupils to solve these real, personally imagined, or self-described problems, and 'described-by-another' problems, schools have relied almost exclusively on training with problems of the last sort only. The following page taken almost at random from one of the best recent textbooks could be paralleled by thousands of others; and the oral problems put by teachers have, as a rule, no real situation supporting them.

1. At 70 cents per 100 pounds, what will be the amount of duty on an invoice of 3622 steel rails, each rail being 27 feet long and weighing 60 pounds to the yard?
2. A man had property valued at \$6500. What will be his taxes at the rate of \$10.80 per \$1000?
3. Multiply seventy thousand fourteen hundred-thousandths by one hundred nine millionths, and divide the product by five hundred forty-five.
4. What number multiplied by $43\frac{3}{4}$ will produce $265\frac{5}{8}$?
5. What decimal of a bushel is 3 quarts?
6. A man sells $\frac{5}{8}$ of an acre of land for \$93.75. What would be the value of his farm of $150\frac{3}{4}$ acres at the same rate?
7. A coal dealer buys 375 tons coal at \$4.25 per ton of 2240 pounds. He sells it at \$4.50 per ton of 2000 pounds. What is his profit?
8. Bought 60 yards of cloth at the rate of 2 yards for \$5, and 80 yards more at the rate of 4 yards for \$9. I immediately sold the whole of it at the rate of 5 yards for \$12. How much did I gain?
9. A man purchased 40 bushels of apples at \$1.50 per bushel. Twenty-five hundredths of them were damaged, and he sold them at 20 cents per peck. He sold the remainder at 50 cents per peck. How much did he gain or lose?
10. If oranges are $37\frac{1}{2}$ cents per dozen, how many boxes, each containing 480, can be bought for \$60?
11. A man can do a piece of work in $18\frac{3}{4}$ days. What part of it can he do in $6\frac{2}{3}$ days?
12. How old to-day is a boy that was born Oct. 29, 1896? [Walsh, '06, Part I, p. 165.]

As a result, teachers and textbook writers have come to think of the functions of solving arithmetical problems as identical with the function of solving the described problems which they give in school in books, examination papers, and the like. If they do not think explicitly that this is so, they still act in training and in testing pupils as if it were so.

It is not. Problems should be solved in school to the end that pupils may solve the problems which life offers. To know what change one should receive after a given real purchase, to keep one's accounts accurately, to adapt a recipe for six so as to make enough of the article for four persons, to estimate the amount of seed required for a plot of a given size from the statement of the amount required per acre, to make with surety the applications that the household, small stores, and ordinary trades require—such is the ability that the elementary school should develop. Other things being equal, the school should set problems in arithmetic which life then and later will set, should favor the situations which life itself offers and the responses which life itself demands.

Other things are not always equal. The same amount of time and effort will often be more productive toward the final end if directed during school to 'made-up' problems. The keeping of personal financial accounts as a school exercise is usually impracticable, partly because some of the children have no earnings or allowance—no accounts to keep, and partly because the task of supervising work when each child has a different problem is too great for the teacher. The use of real household and shop problems will be easy only when the school program includes the household arts and industrial education, and when these subjects themselves are taught so as to improve the functions used by real life. Very often the most efficient course is to make sure that arithmetical procedures are applied to the real and personally initiated problems which they fit, by having a certain number of such problems arise and be solved; then to make sure that the similarity between these real problems and certain described problems of the textbook or teacher's giving is appreciated; and then to give the needed drill work with described problems. In many cases the school practice is fairly well justified in assuming that solving described problems will prepare the pupil to solve the corresponding real problems actually much better than the same amount of time spent on the real problems themselves.

All this is true, yet the general principle remains that, other things being equal, the school should favor real situations, should present issues as life will present them.

Where other things make the use of verbally described problems of the ordinary type desirable, these should be chosen so as to give a maximum of preparation for the real applications of arithmetic in life. We should not, for example, carelessly use any problem that comes to mind in applying a certain principle, but should stop to consider just what the situations of life really require and show clearly the application of that principle. For example, contrast these two problems applying cancellation:—

A. A man sold 24 lambs at \$18 apiece on each of six days, and bought 8 pounds of metal with the proceeds. How much did he pay per ounce for the metal?

B. How tall must a rectangular tank 16" long by 8" wide be to hold as much as a rectangular tank 24" by 18" by 6"?

The first problem not only presents a situation that would rarely or never occur, but also takes a way to find the answer that would not, in that situation, be taken since the price set by another would determine the amount.

Much thought and ingenuity should in the future be expended in eliminating problems whose solution does not improve the real function to be improved by applied arithmetic, or improves it at too great cost, and in devising problems which prepare directly for life's demands and still can fit into a curriculum that can be administered by one teacher in charge of thirty or forty pupils, under the limitations of school life.

The following illustrations will to some extent show concretely what the ability to apply the knowledge and power represented by abstract or pure arithmetic—the so-called fundamentals—in solving problems should mean and what it should not mean.

Samples of Desirable Applications of Arithmetic in Problems where the Situation is Actually Present to Sense in Whole or in Part

Keeping the scores and deciding which side beat and by how much in appropriate classroom games, spelling matches, and the like.

Computing costs, making and inspecting change, taking inventories, and the like with a real or play store.

Mapping the school garden, dividing it into allotments, planning for the purchase of seeds, and the like.

Measuring one's own achievement and progress in tests of word-knowledge, spelling, addition, subtraction, speed of writing, and the like. Measuring the rate of improvement per hour of practice or per week of school life, and the like.

Estimating costs of food cooked in the school kitchen, articles made in the school shops, and the like.

Computing the cost of telegrams, postage, expressage, for a real message or package, from the published tariffs.

Computing costs from mail order catalogues and the like.

Samples of Desirable Applications of Arithmetic where the Situation is Not Present to Sense

The samples given here all concern the subtraction of fractions. Samples concerning any other arithmetical principle may be found in the appropriate pages of any text which contains problem-material selected with consideration of life's needs.

A

1. Dora is making jelly. The recipe calls for 24 cups of sugar and she has only $21\frac{1}{2}$. She has no time to go to the store so she has to borrow the sugar from a neighbor. How much must she get?

Subtract

$$\begin{array}{r} 24 \\ 21\frac{1}{2} \\ \hline 2\frac{1}{2} \end{array} \quad \begin{array}{l} \text{Think } \frac{1}{2} \text{ and } \frac{1}{2} = 1. \text{ Write } \frac{1}{2}. \\ \text{Think } 2 \text{ and } 2 = 4. \text{ Write the } 2. \end{array}$$

2. A box full of soap weighs $29\frac{1}{2}$ lb. The empty box weighs $3\frac{1}{2}$ lb. How much does the soap alone weigh?

3. On July 1, Mr. Lewis bought a 50-lb. bag of ice-cream salt. On July 15 there were just $11\frac{1}{2}$ lb. left. How much had he used in the two weeks?

4. Grace promised to pick 30 qt. blueberries for her mother. So far she has picked $18\frac{1}{2}$ qt. How many more quarts must she pick?

B

This table of numbers tells what Nell's baby sister Mary weighed every two months from the time she was born till she was a year old.

**Weight of Mary
Adams**

When born	$7\frac{3}{8}$ lb.
2 months old	$11\frac{1}{4}$ lb.
4 months old	$14\frac{1}{8}$ lb.
6 months old	$15\frac{3}{4}$ lb.
8 months old	$17\frac{5}{8}$ lb.
10 months old	$19\frac{1}{2}$ lb.
12 months old	$21\frac{3}{8}$ lb.

1. How much did the Adams baby gain in the first two months?
2. How much did the Adams baby gain in the second two months?
3. In the third two months?
4. In the fourth two months?
5. From the time it was 8 months old till it was 10 months old?
6. In the last two months?
7. From the time it was born till it was 6 months old?

C

1. Helen's exact average for December was $87\frac{1}{3}$. Kate's was $84\frac{1}{2}$. How much higher was Helen's than Kate's?

$$\begin{array}{r} 87\frac{1}{3} \\ 84\frac{1}{2} \\ \hline \end{array}$$

How do you think of $\frac{1}{2}$ and $\frac{1}{3}$?

How do you think of $1\frac{2}{6}$?

How do you change the 4?

2. Find the exact average for each girl in the following list. Write the answers clearly so that you can see them easily. You will use them in solving problems 3, 4, 5, 6, 7, and 8.

	Alice	Dora	Emma	Grace	Louise	Mary
Reading	91	87	83	81	79	77
Language	88	78	82	79	73	78
Arithmetic	89	85	79	75	84	87
Spelling	90	79	75	80	82	91
Geography	91	87	83	75	78	85
Writing	90	88	75	72	93	92

3. Which girl had the highest average?
4. How much higher was her average than the next highest?
5. How much difference was there between the highest and the lowest girl?
6. Was Emma's average higher or lower than Louise's? How much?
7. How much difference was there between Alice's average and Dora's?
8. How much difference was there between Mary's average and Nell's?
9. Write five other problems about these averages, and solve each of them.

Samples of Undesirable Applications of Arithmetic^[1]

Will has XXI marbles, XII jackstones, XXXVI pieces of string. How many things had he?

George's kite rose CDXXXV feet and Tom's went LXIII feet higher. How high did Tom's kite rise?

If from DCIV we take CCIV the result will be a number IV times as large as the number of dollars Mr. Dane paid for his horse. How much did he pay for his horse?

Hannah has $\frac{5}{8}$ of a dollar, Susie $\frac{7}{25}$, Nellie $\frac{3}{4}$, Norah $\frac{13}{16}$. How much money have they all together?

A man saves $3\frac{17}{80}$ dollars a week. How much does he save in a year?

A tree fell and was broken into 4 pieces, $13\frac{1}{6}$ feet, $10\frac{3}{7}$ feet, $8\frac{1}{2}$ feet, and $7\frac{16}{21}$ feet long. How tall was the tree?

Annie's father gave her 20 apples to divide among her friends. She gave each one $2\frac{2}{9}$ apples apiece. How many playmates had she?

John had $17\frac{2}{5}$ apples. He divided his whole apples into fifths. How many pieces had he in all?

A landlady has $3\frac{3}{7}$ pies to be divided among her 8 boarders. How much will each boarder receive?

There are twenty columns of spelling words in Mary's lesson and 16 words in each column. How many words are in her lesson?

There are 9 nuts in a pint. How many pints in a pile of 5,888,673 nuts?

The Adams school contains eight rooms; each room contains 48 pupils; if each pupil has eight cents, how much have they together?

A pile of wood in the form of a cube contains $15\frac{1}{2}$ cords. What are the dimensions to the nearest inch?

A man 6 ft. high weighs 175 lb. How tall is his wife who is of similar build, and weighs 125 lb.?

A stick of timber is in the shape of the frustum of a square pyramid, the lower base being 22 in. square and the upper 14 in. square. How many cubic feet in the log, if it is 22 ft. long?

Mr. Ames, being asked his age, replied: "If you cube one half of my age and add 41,472 to the result, the sum will be one half the cube of my age. How old am I?"

These samples, just given, of the kind of problem-solving that should not be emphasized in school training refer in some cases to books of forty years back, but the following represent the results of a collection made in 1910 from books then in excellent repute. It required only about an hour to collect them; and I am confident that a thousand such problems describing situations that the pupil will never encounter in real life, or putting questions that he will never be asked in real life, could easily be found in any ten textbooks of the decade from 1900 to 1910.

If there are 250 kernels of corn on one ear, how many are there on 24 ears of corn the same size?

Maud is four times as old as her sister, who is 4 years old. What is the sum of their ages?

If the first century began with the year 1, with what year does it end?

Every spider has 8 compound eyes. How many eyes have 21 spiders?

A nail 4 inches long is driven through a board so that it projects 1.695 inches on one side and 1.428 on the other. How thick is the board?

Find the perimeter of an envelope 5 in. by $3\frac{1}{4}$ in.

How many minutes in $\frac{5}{9}$ of $\frac{9}{4}$ of an hour?

Mrs. Knox is $\frac{3}{4}$ as old as Mr. Knox, who is 48 years old. Their son Edward is $\frac{4}{9}$ as old as his mother. How old is Edward?

Suppose a pie to be exactly round and $10\frac{1}{2}$ miles in diameter. If it were cut into 6 equal pieces, how long would the curved edge of each piece be?

$8\frac{1}{3}\%$ of a class of 36 boys were absent on a rainy day. $33\frac{1}{3}\%$ of those present went out of the room to the school yard. How many were left in the room?

Just after a ton of hay was weighed in market, a horse ate one pound of it. What was the ratio of what he ate to what was left?

If a fan having 15 rays opens out so that the outer rays form a straight line, how many degrees are there between any two adjacent rays?

One half of the distance between St. Louis and New Orleans is 280 miles more than $\frac{1}{10}$ of the distance; what is the distance between these places?

If the pressure of the atmosphere is 14.7 lb. per square inch what is the pressure on the top of a table $1\frac{1}{4}$ yd. long and $\frac{2}{3}$ yd. wide?

$\frac{13}{28}$ of the total acreage of barley in 1900 was 100,000 acres; what was the total acreage?

What is the least number of bananas that a mother can exactly divide between her 2 sons, or among her 4 daughters, or among all her children?

If Alice were two years older than four times her actual age she would be as old as her aunt, who is 38 years old. How old is Alice?

Three men walk around a circular island, the circumference of which is 360 miles. A walks 15 miles a day, B 18 miles a day, and C 24 miles a day. If they start together and walk in the same direction, how many days will elapse before they will be together again?

With only thirty or forty dollars a year to spend on a pupil's education, of which perhaps eight dollars are spent on improving his arithmetical abilities, the immediate guidance of his responses to real situations and personally initiated problems has to be supplemented largely by guidance of his responses to problems described in words, diagrams, pictures, and the like. Of these latter, words will be used most often. As a consequence the understanding of the words used in these descriptions becomes a part of the ability required in arithmetic. Such word knowledge is also required in so far as the problems to be solved in real life are at times described, as in advertisements, business letters, and the like.

This is recognized by everybody in the case of words like *remainder, profit, loss, gain, interest, cubic capacity, gross, net, and discount*, but holds equally of *let, suppose, balance, average, total, borrowed, retained*, and many such semi-technical words, and may hold also of hundreds of other words unless the textbook and teacher are careful to use only words and sentence structures which daily life and the class work in English have made well known to the pupils. To apply arithmetic to a problem a pupil must understand what the problem is; problem-solving depends on problem-reading. In actual school practice training in problem-reading will be less and less necessary as we get rid of problems to be solved simply for the sake of solving them, unnecessarily unreal problems, and clumsy descriptions, but it will remain to some extent as an important joint task for the 'arithmetical' and 'reading' of the elementary school.

ARITHMETICAL REASONING

The last respect in which the nature of arithmetical abilities requires definition concerns arithmetical reasoning. An adequate treatment of the reasoning that may be expected of pupils in the elementary school and of the most efficient ways to encourage and improve it cannot be given until we have studied the formation of habits. For reasoning is essentially the organization and control of habits of thought. Certain matters may, however, be decided here. The first concerns the use of computation and problems merely for discipline,—that is, the emphasis on training in reasoning regardless of whether the problem is otherwise worth reasoning about. It used to be thought that the mind was a set of faculties or abilities or powers which grew strong and competent by being exercised in a certain way, no matter on what they were exercised. Problems that could not occur in life, and were entirely devoid of any worthy interest, save the intellectual interest in solving them, were supposed to be nearly or quite as useful in training the mind to reason as the genuine problems of the home, shop, or trade. Anything that gave the mind a chance to reason would do; and pupils labored to find when the minute hand and hour hand would be together, or how many sheep a shepherd had if half of what he had plus ten was one third of twice what he had!

We now know that the training depends largely on the particular data used, so that efficient discipline in reasoning requires that the pupil reason about matters of real importance. There is no magic essence or faculty of reasoning that works in general and irrespective of the particular facts and relations reasoned about. So we should try to find problems which not only stimulate the pupil to reason, but also direct his reasoning in useful channels and reward it by results that are of real significance. We should replace the purely disciplinary problems by problems that are also valuable as special training for important particular situations of life. Reasoning sought for reasoning's sake alone is too wasteful an expenditure of time and is also likely to be inferior as reasoning.

The second matter concerns the relative merits of 'catch' problems, where the pupil has to go against some customary habit of thinking, and what we may call 'routine' problems, where the regular ways of thinking that have served him in the past will, except for some blunder, guide him rightly.

Consider, for example, these four problems:

1. "A man bought ten dozen eggs for \$2.50 and sold them for 30 cents a dozen. How many cents did he lose?"
2. "I went into Smith's store at 9 A.M. and remained until 10 A.M. I bought six yards of gingham at 40 cents a yard and three yards of muslin at 20 cents a yard and gave a \$5.00 bill. How long was I in the store?"
3. "What must you divide 48 by to get half of twice 6?"
4. "What must you add to 19 to get 30?"

The 'catch' problem is now in disrepute, the wise teacher feeling by a sort of intuition that to willfully require a pupil to reason to a result sharply contrary to that to which previous habits lead him is risky. The four illustrations just given show, however, that mere 'catchiness' or 'contra-previous-habit-ness' in a problem is not enough to condemn it. The fourth problem is a catch problem, but so useful a one that it has been adopted in many modern books as a routine drill! The first problem, on the contrary, all, save those who demand no higher criterion for a problem than that it make the pupil 'think,' would reject. It demands the reversal of fixed habits *to no valid purpose*; for in life the question in such case would never (or almost never) be 'How many cents did he lose?' but 'What was the result?' or simply 'What of it?' This problem weakens without excuse the child's confidence in the training he has had. Problems like (2) are given by teachers of excellent reputation, but probably do more harm than good. If a pupil should interrupt his teacher during the recitation in arithmetic by saying, "I got up at 7 o'clock to multiply 9 by $2\frac{3}{4}$ and got $24\frac{3}{4}$ for my answer; was that the right time to get up?" the teacher would not thank fortune for the stimulus to thought but would think the child a fool. Such catch questions may be fairly useful as an object lesson on the value of search for the essential element in a situation if a great variety of them are given one after another with routine problems intermixed and with warning of the general nature of the exercise at the beginning. Even so, it should be remembered that reasoning should be chiefly a force organizing habits, not opposing them; and also that there are enough bad habits to be opposed to give all necessary training. Fabricated puzzle situations wherein a peculiar hidden element of the situation makes the good habits called up by the situation misleading are useful therefore rather as a relief and amusing variation in arithmetical work than as stimuli to thought.

Problems like the third quoted above we might call puzzling rather than 'catch' problems. They have value as drills in analysis of a situation into its elements that will amuse the gifted children, and as tests of certain abilities. They also require that of many confusing habits, the right one be chosen, rather than that ordinary habits be set aside by some hidden element in the situation. Not enough is known about their effect to enable us to decide whether or not the elementary school should include special facility with them as one of the arithmetical functions that it specially trains.

The fourth 'catch' quoted above, which all would admit is a good problem, is good because it opposes a good habit for the sake of another good habit, forces the analysis of an element whose analysis life very much requires, and does it with no obvious waste. It is not safe to leave a child with the one habit of responding to 'add, 19, 30' by 49, for in life the 'have 19, must get to have 30' situation is very frequent and important.

On the whole, the ordinary problems which ordinary life proffers seem to be the sort that should be reasoned out, though the elementary school may include the less noxious forms of pure mental gymnastics for those pupils who like them.

SUMMARY

These discussions of the meanings of numbers, the linguistic demands of arithmetic, the distinction between scholastic and real applications of arithmetic, and the possible restrictions of training in reasoning,—may serve as illustrations of the significance of the question, "What are the functions that the elementary school tries to improve in its teaching of arithmetic?" Other matters might well be considered in this connection, but the main outline of the work of the elementary school is now fairly clear. The arithmetical functions or abilities which it seeks to improve are, we may say:—

- (1) Working knowledge of the meanings of numbers as names for certain sized collections, for certain relative magnitudes, the magnitude of unity being known, and for certain centers or nuclei of relations to other numbers.
- (2) Working knowledge of the system of decimal notation.
- (3) Working knowledge of the meanings of addition, subtraction, multiplication, and division.
- (4) Working knowledge of the nature and relations of certain common measures.
- (5) Working ability to add, subtract, multiply, and divide with integers, common and decimal fractions, and denominate numbers, all being real positive numbers.
- (6) Working knowledge of words, symbols, diagrams, and the like as required by life's simpler arithmetical demands or by economical preparation therefor.
- (7) The ability to apply all the above as required by life's simpler arithmetical demands or by economical preparation therefor, including (7 a) certain specific abilities to solve problems concerning areas of rectangles, volumes of rectangular solids, percents, interest, and certain other common occurrences in household, factory, and business life.

THE SOCIOLOGY OF ARITHMETIC

The phrase 'life's simpler arithmetical demands' is necessarily left vague. Just what use is being made of arithmetic in this country in 1920 by each person therein, we know only very roughly. What may be called a 'sociology' of arithmetic is very much needed to investigate this matter. For rare or difficult demands the elementary school should not prepare; there are too many other desirable abilities that it should improve.

A most interesting beginning at such an inventory of the actual uses of arithmetic has been made by Wilson [19] and Mitchell.^[2] Although their studies need to be much extended and checked by other methods of inquiry, two main facts seem fairly certain.

First, the great majority of people in the great majority of their doings use only very elementary arithmetical processes. In 1737 cases of addition reported by Wilson, seven eighths were of five numbers or less. Over half of the multipliers reported were one-figure numbers. Over 95 per cent of the fractions operated with were included in this list: $\frac{1}{2}$ $\frac{1}{4}$ $\frac{3}{4}$ $\frac{1}{3}$ $\frac{2}{3}$ $\frac{1}{8}$ $\frac{3}{8}$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{4}{5}$. Three fourths of all the cases reported were simple one-step computations with integers or United States money.

Second, they often use these very elementary processes, not because such are the quickest and most convenient, but because they have lost, or maybe never had, mastery of the more advanced processes which would do the work better. The 5 and 10 cent stores, the counter with "Anything on this counter for 25¢," and the arrangements for payments on the installment plan are familiar instances of human avoidance of arithmetic. Wilson found very slight use of decimals; and Mitchell found men computing with 49ths as common fractions when the use of decimals would have been more efficient. If given 120 seconds to do a test like that shown below, leading lawyers, physicians, manufacturers, and business men and their wives will, according to my experience, get only about half the work right. Many women, finding on their meat bill "7 $\frac{3}{8}$ lb. roast beef \$2.36," will spend time and money to telephone the butcher asking how much roast beef was per pound, because they have no sure power in dividing by a mixed number.

Test

Perform the operations indicated. Express all fractions in answers in lowest terms.

Add:

$$\frac{3}{4} + \frac{1}{6} + .25$$

4 yr. 6 mo.
1 yr. 2 mo.
6 yr. 9 mo.
3 yr. 6 mo.
4 yr. 5 mo.

Subtract:

$$8.6 - 6.05007 \quad \frac{7}{8} - \frac{2}{3} = \quad 5\frac{7}{16} - 2\frac{3}{16} =$$

Multiply:

$$7 \times 8 \times 4\frac{1}{2} =$$

29 ft.	6 in.
8	

Divide:

$$4\frac{1}{2} \div 7 =$$

It seems probable that the school training in arithmetic of the past has not given enough attention to perfecting the more elementary abilities. And we shall later find further evidence of this. On the other hand, the fact that people in general do not at present use a process may not mean that they ought not to use it.

Life's simpler arithmetical demands certainly do not include matters like the rules for finding cube root or true discount, which no sensible person uses. They should not include matters like computing the lateral surface or volume of pyramids and cones, or knowing the customs of plasterers and paper hangers, which are used only by highly specialized trades. They should not include matters like interest on call loans, usury, exact interest, and the rediscounting of notes, which concern only brokers, bank clerks, and rich men. They should not include the technique of customs which are vanishing from efficient practice, such as simple interest on amount for times longer than a year, days of grace, or extremes and means in proportions. They should not include any elaborate practice with very large numbers, or decimals beyond thousandths, or the addition and subtraction of fractions which not one person in a hundred has to add or subtract oftener than once a year.

When we have an adequate sociology of arithmetic, stating accurately just who should use each arithmetical ability and how often, we shall be able to define the task of the elementary school in this respect. For the present, we may proceed by common sense, guided by two limiting rules. The first is,—"It is no more desirable for the elementary school to teach all the facts of arithmetic than to teach all the words in the English language, or all the topography of the globe, or all the details of human physiology." The second is,—"It is not desirable to eliminate any element of arithmetical training until you have something better to put in its place."

CHAPTER II

THE MEASUREMENT OF ARITHMETICAL ABILITIES

One of the best ways to clear up notions of what the functions are which schools should develop and improve is to get measures of them. If any given knowledge or skill or power or ideal exists, it exists in some amount. A series of amounts of it, varying from less to more, defines the ability itself in a way that no general verbal description can do. Thus, a series of weights, 1 lb., 2 lb., 3 lb., 4 lb., etc., helps to tell us what we mean by weight. By finding a series of words like *only*, *smoke*, *another*, *pretty*, *answer*, *taylor*, *circus*, *telephone*, *saucy*, and *beginning*, which are spelled correctly by known and decreasing percentages of children of the same age, or of the same school grade, we know better what we mean by 'spelling-difficulty.' Indeed, until we can measure the efficiency and improvement of a function, we are likely to be vague and loose in our ideas of what the function is.

A SAMPLE MEASUREMENT OF AN ARITHMETICAL ABILITY: THE ABILITY TO ADD INTEGERS

Consider first, as a sample, the measurement of ability to add integers.

The following were the examples used in the measurements made by Stone ['08]:

	596	4695
	428	872
2375	94	7948
4052	75	6786
6354	304	567
260	645	858
5041	984	9447
1543	897	7499
_____	_____	_____

The scoring was as follows: Credit of 1 for each column added correctly. Stone combined measures of other abilities with this in a total score for amount done correctly in 12 minutes. Stone also scored the correctness of the additions in certain work in multiplication.

Courtis uses a sheet of twenty-four tasks or 'examples,' each consisting of the addition of nine three-place numbers as shown below. Eight minutes is allowed. He scores the amount done by the number of examples, and also scores the number of examples done correctly, but does not suggest any combination of these two into a general-efficiency score.

927
379
756
837
924
110
854
965
344

The author long ago proposed that pupils be measured also with series like *a* to *g* shown below, in which the difficulty increases step by step.

g.					13			
		13		9	14	12	9	
		9		13	12	9	14	24
	23	19	19	29	9	9	13	21
	28	26	26	14	8	8	29	23
	29	16	15	19	17	19	19	22
	—	—	—	—	—	—	—	—

Woody [16] has constructed his well-known tests on this principle, though he uses only one example at each step of difficulty instead of eight or ten as suggested above. His test, so far as addition of integers goes, is:—

SERIES A. ADDITION SCALE (in part)

By Clifford Woody

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2	2	17	53	72	60		
3	4	2	45	26	37	3 + 1 =	2 + 5 + 1
—	3	—	—	—	—		=
—	—	—	—	—	—		
(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
21	32	43	23		100	9	199
33	59	1	25	25 + 42	33	24	194
35	17	2	16	=	45	12	295
—	—	13	—	—	201	15	156
		—			46	19	
					—	—	
(19)	(20)	(21)	(22)				
			547				
			197				
		\$8.00	685				
		5.75	678				
\$.75	\$12.50	2.33	456				
1.25	16.75	4.16	393				
.49	15.75	.94	525				
—	—	6.32	240				
		—	152				
			—				

In his original report, Woody gives no scheme for scoring an individual, wisely assuming that, with so few samples at each degree of difficulty, a pupil's score would be too unreliable for individual diagnosis. The test is reliable for a class; and for a class Woody used the degree of difficulty such that a stated fraction of the class can do the work correctly, if twenty minutes is allowed for the thirty-eight examples of the entire test.

The measurement of even so simple a matter as the efficiency of a pupil's responses to these tests in adding integers is really rather complex. There is first of all the problem of combining speed and accuracy into some single estimate. Stone gives no credit for a column unless it is correctly added. Curtis evades the difficulty by reporting both number done and number correct. The author's scheme, which gives specified weights to speed and accuracy at each step of the series, involves a rather intricate computation.

This difficulty of equating speed and accuracy in adding means precisely that we have inadequate notions of what the ability is that the elementary school should improve. Until, for example, we have decided whether, for a given group of pupils, fifteen Curtis attempts with ten right, is or is not a better achievement than ten Curtis

attempts with nine right, we have not decided just what the business of the teacher of addition is, in the case of that group of pupils.

There is also the difficulty of comparing results when short and long columns are used. Correctness with a short column, say of five figures, testifies to knowledge of the process and to the power to do four successive single additions without error. Correctness with a long column, say of ten digits, testifies to knowledge of the process and to the power to do nine successive single additions without error. Now if a pupil's precision was such that on the average he made one mistake in eight single additions, he would get about half of his five-digit columns right and almost none of his ten-digit columns right. (He would do this, that is, if he added in the customary way. If he were taught to check results by repeated addition, by adding in half-columns and the like, his percentages of accurate answers might be greatly increased in both cases and be made approximately equal.) Length of column in a test of addition under ordinary conditions thus automatically overweights precision in the single additions as compared with knowledge of the process, and ability at carrying.

Further, in the case of a column of whatever size, the result as ordinarily scored does not distinguish between one, two, three, or more (up to the limit) errors in the single additions. Yet, obviously, a pupil who, adding with ten-digit columns, has half of his answer-figures wrong, probably often makes two or more errors within a column, whereas a pupil who has only one column-answer in ten wrong, probably almost never makes more than one error within a column. A short-column test is then advisable as a means of interpreting the results of a long-column test.

Finally, the choice of a short-column or of a long-column test is indicative of the measurer's notion of the kind of efficiency the world properly demands of the school. Twenty years ago the author would have been readier to accept a long-column test than he now is. In the world at large, long-column addition is being more and more done by machine, though it persists still in great frequency in the bookkeeping of weekly and monthly accounts in local groceries, butcher shops, and the like.

The search for a measure of ability to add thus puts the problem of speed *versus* precision, and of short-column *versus* long-column additions clearly before us. The latter problem has hardly been realized at all by the ordinary definitions of ability to add.

It may be said further that the measurement of ability to add gives the scientific student a shock by the lack of precision found everywhere in schools. Of what value is it to a graduate of the elementary school to be able to add with examples like those of the Curtis test, getting only eight out of ten right? Nobody would pay a computer for that ability. The pupil could not keep his own accounts with it. The supposed disciplinary value of habits of precision runs the risk of turning negative in such a case. It appears, at least to the author, imperative that checking should be taught and required until a pupil can add single columns of ten digits with not over one wrong answer in twenty columns. Speed is useful, especially indirectly as an indication of control of the separate higher-decade additions, but the social demand for addition below a certain standard of precision is *nil*, and its disciplinary value is *nil* or negative. This will be made a matter of further study later.

MEASUREMENTS OF ABILITIES IN COMPUTATION

Measurements of these abilities may be of two sorts—(1) of the speed and accuracy shown in doing one same sort of task, as illustrated by the Curtis test for addition shown on page 28; and (2) of how hard a task can be done perfectly (or with some specified precision) within a certain assigned time or less, as illustrated by the author's rough test for addition shown on pages 28 and 29, and by the Woody tests, when extended to include alternative forms.

The Curtis tests, originated as an improvement on the Stone tests and since elaborated by the persistent devotion of their author, are a standard instrument of the first sort for measuring the so-called 'fundamental' arithmetical abilities with integers. They are shown on this and the following page.

Tests of the second sort are the Woody tests, which include operations with integers, common and decimal fractions, and denominate numbers, the Ballou test for common fractions [16], and the "Ladder" exercises of the Thorndike arithmetics. Some of these are shown on pages 36 to 41.

Curtis Test

Arithmetic. Test No. 1. Addition

Series B

You will be given eight minutes to find the answers to as many of these addition examples as possible. Write the answers on this paper directly underneath the examples. You are not expected to be able to do them all. You will be marked for both speed and accuracy, but it is more important to have your answers right than to try a great many examples.

927	297	136	486	384	176	277	837
379	925	340	765	477	783	445	882
756	473	988	524	881	697	682	959
837	983	386	140	266	200	594	603
924	315	353	812	679	366	481	118
110	661	904	466	241	851	778	781
854	794	547	355	796	535	849	756
965	177	192	834	850	323	157	222
344	124	439	567	733	229	953	525

and sixteen more addition examples of nine three-place numbers.

Courtis Test

Arithmetic. Test No. 2. Subtraction

Series B

You will be given four minutes to find the answers to as many of these subtraction examples as possible. Write the answers on this paper directly underneath the examples. You are not expected to be able to do them all. You will be marked for both speed and accuracy, but it is more important to have your answers right than to try a great many examples.

107795491	75088824	91500053	87939983
77197029	57406394	19901563	72207316

and twenty more tasks of the same sort.

Courtis Test

Arithmetic. Test No. 3. Multiplication

Series B

You will be given six minutes to work as many of these multiplication examples as possible. You are not expected to be able to do them all. Do your work directly on this paper; use no other. You will be marked for both speed and accuracy, but it is more important to get correct answers than to try a large number of examples.

8246	7843	4837	3478	6482
29	702	83	15	46

and twenty more multiplication examples of the same sort.

Courtis Test

Arithmetic. Test No. 4. Division

Series B

You will be given eight minutes to work as many of these division examples as possible. You are not expected to be able to do them all. Do your work directly on this paper; use no other. You will be marked for both speed and accuracy, but it is more important to get correct answers than to try a large number of examples.

$$25 \overline{)6775} \quad 94 \overline{)85352} \quad 37 \overline{)9990} \quad 86 \overline{)80066}$$

and twenty more division examples of the same sort.

SERIES B. MULTIPLICATION SCALE

By Clifford Woody

(1) $3 \times 7 =$	(3) $2 \times 3 =$	(4) $4 \times 8 =$	(5) $\begin{array}{r} 23 \\ 3 \\ \hline \end{array}$
(8) $\begin{array}{r} 50 \\ 3 \\ \hline \end{array}$	(9) $\begin{array}{r} 254 \\ 6 \\ \hline \end{array}$	(11) $\begin{array}{r} 1036 \\ 8 \\ \hline \end{array}$	(12) $\begin{array}{r} 5096 \\ 6 \\ \hline \end{array}$
(13) $\begin{array}{r} 8754 \\ 8 \\ \hline \end{array}$	(16) $\begin{array}{r} 7898 \\ 9 \\ \hline \end{array}$	(18) $\begin{array}{r} 24 \\ 234 \\ \hline \end{array}$	(20) $\begin{array}{r} 287 \\ .05 \\ \hline \end{array}$
(24) $\begin{array}{r} 16 \\ 2\frac{5}{8} \\ \hline \end{array}$	(26) $\begin{array}{r} 9742 \\ 59 \\ \hline \end{array}$	(27) $\begin{array}{r} 6.25 \\ 3.2 \\ \hline \end{array}$	(29) $\frac{1}{8} \times 2 =$
(33) $2\frac{1}{2} \times 3\frac{1}{2} =$	(35) $\begin{array}{r} 987\frac{3}{4} \\ 25 \\ \hline \end{array}$	(37) $2\frac{1}{4} \times 4\frac{1}{2} \times 1\frac{1}{2} =$	(38) $\begin{array}{r} .0963\frac{1}{8} \\ .084 \\ \hline \end{array}$

SERIES B. DIVISION SCALE

By Clifford Woody

(1) $3 \overline{)6}$	(2) $9 \overline{)27}$	(7) $4 \div 2 =$	(8) $9 \overline{)0}$
(11) $2 \overline{)13}$	(14) $8 \overline{)5856}$	(15) $\frac{1}{4} \text{ of } 128 =$	(17) $50 \div 7 =$
(19) $248 \div 7 =$	(23) $23 \overline{)469}$	(27) $\frac{7}{8} \text{ of } 624 =$	(28) $.003 \overline{).0936}$

(30) $\frac{3}{4} \div 5 =$

(34) $62.50 \div 1\frac{1}{4} =$

(36) $9 \overline{) 69 \text{ lbs. } 9 \text{ oz.}}$

Ballou Test

Addition of Fractions

<p>(1) $\frac{1}{4}$ $\frac{1}{4}$ —</p>	<p>Test 1</p>	<p>(2) $\frac{3}{14}$ $\frac{1}{14}$ —</p>	<p>(1) $\frac{1}{3}$ $\frac{1}{6}$ —</p>	<p>Test 2</p>	<p>(2) $\frac{2}{7}$ $\frac{3}{14}$ —</p>
<p>(1) $\frac{3}{5}$ $\frac{11}{15}$ —</p>	<p>Test 3</p>	<p>(2) $\frac{5}{6}$ $\frac{1}{2}$ —</p>	<p>(1) $\frac{1}{7}$ $\frac{9}{10}$ —</p>	<p>Test 4</p>	<p>(2) $\frac{7}{9}$ $\frac{1}{4}$ —</p>
<p>(1) $\frac{1}{10}$ $\frac{1}{6}$ —</p>	<p>Test 5</p>	<p>(2) $\frac{4}{9}$ $\frac{5}{12}$ —</p>	<p>(1) $\frac{1}{6}$ $\frac{9}{10}$ —</p>	<p>Test 6</p>	<p>(2) $\frac{5}{6}$ $\frac{3}{8}$ —</p>

An Addition Ladder [Thorndike, '17, III, 5]

Begin at the bottom of the ladder. See if you can climb to the top without making a mistake. Be sure to copy the numbers correctly.

- Step 6.** a. Add $1\frac{1}{3}$ yd., $\frac{7}{8}$ yd., $1\frac{1}{4}$ yd., $\frac{3}{4}$ yd., $\frac{7}{8}$ yd., and $1\frac{1}{2}$ yd.
 b. Add $62\frac{1}{2}\text{¢}$, $66\frac{2}{3}\text{¢}$, $56\frac{1}{4}\text{¢}$, 60¢ , and $62\frac{1}{2}\text{¢}$.
 c. Add $1\frac{5}{16}$, $1\frac{9}{32}$, $1\frac{3}{8}$, $1\frac{11}{32}$, and $1\frac{7}{16}$.
 d. Add $1\frac{1}{3}$ yd., $1\frac{1}{4}$ yd., $1\frac{1}{2}$ yd., 2 yd., $\frac{3}{4}$ yd., and $\frac{2}{3}$ yd.
- Step 5.** a. Add 4 ft. $6\frac{1}{2}$ in., $53\frac{1}{4}$ in., 5 ft. $\frac{1}{2}$ in., $56\frac{3}{4}$ in., and 5 ft.
 b. Add 7 lb., 6 lb. 11 oz., $7\frac{1}{2}$ lb., 6 lb. $4\frac{1}{2}$ oz., and $8\frac{1}{2}$ lb.
 c. Add 1 hr. 6 min. 20 sec., 58 min. 15 sec., 1 hr. 4 min., and 55 min.
 d. Add 7 dollars, 13 half dollars, 21 quarters, 17 dimes, and 19 nickels.
- Step 4.** a. Add $.05\frac{1}{2}$, $.06$, $.04\frac{3}{4}$, $.02\frac{3}{4}$, and $.05\frac{1}{4}$.
 b. Add $.33\frac{1}{3}$, $.12\frac{1}{2}$, $.18$, $.16\frac{2}{3}$, $.08\frac{1}{3}$ and $.15$.
 c. Add $.08\frac{1}{3}$, $.06\frac{1}{4}$, $.21$, $.03\frac{3}{4}$, and $.16\frac{2}{3}$.
 d. Add $.62$, $.64\frac{1}{2}$, $.66\frac{2}{3}$, $.10\frac{1}{4}$, and $.68$.
- Step 3.** a. Add $7\frac{1}{4}$, $6\frac{1}{2}$, $8\frac{3}{8}$, $5\frac{3}{4}$, $9\frac{5}{8}$ and $3\frac{7}{8}$.
 b. Add $4\frac{5}{8}$, 12, $7\frac{1}{2}$, $8\frac{3}{4}$, 6 and $5\frac{1}{4}$.
 c. Add $9\frac{3}{4}$, $5\frac{7}{8}$, $4\frac{1}{8}$, $6\frac{1}{2}$, 7, $3\frac{5}{8}$.
 d. Add 12, $8\frac{1}{2}$, $7\frac{1}{3}$, 5, $6\frac{2}{3}$, and $9\frac{1}{2}$.
- Step 2.** a. Add 12.04, .96, 4.7, 9.625, 3.25, and 20.
 b. Add .58, 6.03, .079, 4.206, 2.75, and 10.4.
 c. Add 52, 29.8, 41.07, 1.913, 2.6, and 110.
 d. Add 29.7, 315, 26.75, 19.004, 8.793, and 20.05.

- Step 1.**
- a. Add $10\frac{3}{5}$, $11\frac{1}{5}$, $10\frac{4}{5}$, 11, $11\frac{2}{5}$, $10\frac{3}{5}$, and 11.
 - b. Add $7\frac{3}{8}$, $6\frac{5}{8}$, 8, $9\frac{1}{8}$, $7\frac{7}{8}$, $5\frac{3}{8}$, and $8\frac{1}{8}$.
 - c. Add $21\frac{1}{2}$, $18\frac{3}{4}$, $31\frac{1}{2}$, $19\frac{1}{4}$, $17\frac{1}{4}$, 22, and $16\frac{1}{2}$.
 - d. Add $14\frac{5}{12}$, $12\frac{7}{12}$, $9\frac{11}{12}$, $6\frac{1}{12}$, and 5.

A Subtraction Ladder [Thorndike, '17, III, 11]

Step 9.

- a. 2.16 mi. – $1\frac{3}{4}$ mi.
- b. 5.72 ft. – 5 ft. 3 in.
- c. 2 min. $10\frac{1}{2}$ sec. – 93.4 sec.
- d. 30.28 A. – $10\frac{1}{5}$ A.
- e. 10 gal. $2\frac{1}{2}$ qt. – 4.623 gal.

Step 8.	a	b	c	d	e
	$25\frac{7}{12}$	$10\frac{1}{4}$	$9\frac{5}{16}$	$5\frac{7}{16}$	$4\frac{2}{3}$
	$12\frac{3}{4}$	$7\frac{1}{3}$	$6\frac{3}{8}$	$2\frac{3}{4}$	$1\frac{3}{4}$
	_____	_____	_____	_____	_____

Step 7.	a	b	c	d	e
	$28\frac{3}{4}$	$40\frac{1}{2}$	$10\frac{1}{4}$	$24\frac{1}{3}$	$37\frac{1}{2}$
	$16\frac{1}{8}$	$14\frac{3}{8}$	$6\frac{1}{2}$	$11\frac{1}{2}$	$14\frac{3}{4}$
	_____	_____	_____	_____	_____

Step 6.	a	b	c	d	e
	$10\frac{1}{3}$	$7\frac{1}{4}$	$15\frac{1}{8}$	$12\frac{1}{5}$	$4\frac{1}{16}$
	$4\frac{2}{3}$	$2\frac{3}{4}$	$6\frac{3}{8}$	$11\frac{4}{5}$	$2\frac{7}{16}$
	_____	_____	_____	_____	_____

Step 5.	a	b	c	d	e
	$58\frac{4}{5}$	$66\frac{2}{3}$	$28\frac{7}{8}$	$62\frac{1}{2}$	$9\frac{7}{12}$
	$52\frac{1}{5}$	$33\frac{1}{3}$	$7\frac{5}{8}$	$37\frac{1}{2}$	$4\frac{5}{12}$
	_____	_____	_____	_____	_____

Step 4.

- a. 4 hr. – 2 hr. 17 min.
- b. 4 lb. 7 oz. – 2 lb. 11 oz.
- c. 1 lb. 5 oz. – 13 oz.
- d. 7 ft. – 2 ft. 8 in.
- e. 1 bu. – 1 pk.

Step 3.	a	b	c	d	e
	92 mi.	6735 mi.	\$3 – 89¢	28.4 mi.	\$508.40
	84.15 mi.	6689 mi.		18.04 mi.	208.62
	_____	_____	_____	_____	_____

Step 2.	a	b	c	d	e
	\$25.00	\$100.00	\$750.00	6124 sq. mi.	7846 sq. mi.
	9.36	71.28	736.50	2494 sq. mi.	2789 sq. mi.
	_____	_____	_____	_____	_____

Step 1.	a	b	c	d	e
	\$18.64	\$25.39	\$56.70	819.4 mi.	67.55 mi.

7.40

13.37

45.60

209.2 mi.

36.14 mi.

An Average Ladder [Thorndike, '17, III, 132]

Find the average of the quantities on each line. Begin with **Step 1**. Climb to the top without making a mistake. Be sure to copy the numbers correctly. Extend the division to two decimal places if necessary.

- Step 6.** a. $2\frac{2}{3}$, $1\frac{7}{8}$, $2\frac{3}{4}$, $4\frac{1}{4}$, $3\frac{5}{8}$, $3\frac{1}{2}$
b. $62\frac{1}{2}\text{¢}$, $66\frac{2}{3}\text{¢}$, 40¢ , $83\frac{1}{3}\text{¢}$, \$1.75, \$2.25
c. $3\frac{11}{16}$, $3\frac{9}{32}$, $3\frac{3}{8}$, $3\frac{17}{32}$, $3\frac{7}{16}$
d. .17, 19, $.16\frac{2}{3}$, $.15\frac{1}{2}$, $.23\frac{1}{4}$, .18

- Step 5.** a. 5 ft. $3\frac{1}{2}$ in., $61\frac{1}{4}$ in., $58\frac{3}{4}$ in., 4 ft. 11 in.
b. 6 lb. 9 oz., 6 lb. 11 oz., $7\frac{1}{4}$ lb., $7\frac{3}{8}$ lb.
c. 1 hr. 4 min. 40 sec., 58 min. 35 sec., $1\frac{1}{4}$ hr.
d. 2.8 miles, $3\frac{1}{2}$ miles, 2.72 miles

- Step 4.** a. $.03\frac{1}{2}$, .06, $.04\frac{3}{4}$, $.05\frac{1}{2}$, $.05\frac{1}{4}$
b. .043, .045, .049, .047, .046, .045
c. 2.20, $.87\frac{1}{2}$, 1.18, $.93\frac{3}{4}$, 1.2925, .80
d. $.14\frac{1}{2}$, $.12\frac{1}{2}$, $.33\frac{1}{3}$, $.16\frac{2}{3}$, .15, .17

- Step 3.** a. $5\frac{1}{4}$, $4\frac{1}{2}$, $8\frac{3}{8}$, $7\frac{3}{4}$, $6\frac{5}{8}$, $9\frac{3}{8}$
b. $9\frac{5}{8}$, 12, $8\frac{1}{2}$, $8\frac{3}{4}$, 6, $5\frac{1}{4}$, 9
c. $9\frac{3}{8}$, $5\frac{3}{4}$, $4\frac{1}{8}$, $7\frac{1}{2}$, 6
d. 11, $9\frac{1}{2}$, $10\frac{1}{3}$, 13, $16\frac{2}{3}$, $9\frac{1}{2}$

- Step 2.** a. 13.05, .97, 4.8, 10.625, 3.37
b. 1.48, 7.02, .93, 5.307, 4.1, 7, 10.4
c. 68, 71.4, 59.8, 112, 96.1, 79.8
d. 2.079, 3.908, 4.165, 2.74

- Step 1.** a. 4, $9\frac{1}{2}$, 6, 5, $7\frac{1}{2}$, 8, 10, 9
b. 6, 5, 3.9, 7.1, 8
c. 1086, 1141, 1059, 1302, 1284
d. \$100.82, \$206.49, \$317.25, \$244.73

As such tests are widened to cover the whole task of the elementary school in respect to arithmetic, and accepted by competent authorities as adequate measures of achievement in computing, they will give, as has been said, a working definition of the task. The reader will observe, for example, that work such as the following, though still found in many textbooks and classrooms, does not, in general, appear in the modern tests and scales.

Reduce the following improper fractions to mixed numbers:—

$$\frac{19}{13} \quad \frac{43}{21} \quad \frac{176}{25} \quad \frac{198}{14}$$

Reduce to integral or mixed numbers:—

$$\frac{61381}{37} \quad \frac{2134}{67} \quad \frac{413}{413} \quad \frac{697}{225}$$

Simplify:—

$\frac{3}{4}$ of $\frac{8}{9}$ of $\frac{3}{5}$ of $\frac{15}{22}$

Reduce to lowest terms:—

$\frac{357}{527}$ $\frac{264}{312}$ $\frac{492}{779}$ $\frac{418}{874}$ $\frac{854}{1769}$ $\frac{30}{735}$ $\frac{44}{242}$ $\frac{77}{847}$ $\frac{18}{243}$ $\frac{96}{224}$

Find differences:—

$\frac{6^2}{7}$ $8\frac{5}{11}$ $8\frac{4}{13}$ $5\frac{1}{4}$ $7\frac{1}{8}$
 $3\frac{1}{14}$ $5\frac{1}{7}$ $3\frac{7}{13}$ $2\frac{11}{14}$ $2\frac{1}{7}$

Square:—

$\frac{2}{3}$ $\frac{4}{5}$ $\frac{5}{7}$ $\frac{6}{9}$ $\frac{10}{11}$ $\frac{12}{13}$ $\frac{2}{7}$ $\frac{15}{16}$ $\frac{19}{20}$ $\frac{17}{18}$ $\frac{25}{30}$ $\frac{41}{53}$

Multiply:—

$\frac{2}{11} \times 33$ $32 \times \frac{3}{14}$ $39 \times \frac{2}{13}$ $60 \times \frac{11}{28}$ $77 \times \frac{4}{11}$ $63 \times \frac{2}{27}$
 $54 \times \frac{8}{45}$ $65 \times \frac{3}{13}$ $344\frac{16}{21}$ $432\frac{2}{7}$

MEASUREMENTS OF ABILITY IN APPLIED ARITHMETIC: THE SOLUTION OF PROBLEMS

Stone ['08] measured achievement with the following problems, fifteen minutes being the time allowed.

"Solve as many of the following problems as you have time for; work them in order as numbered:

1. If you buy 2 tablets at 7 cents each and a book for 65 cents, how much change should you receive from a two-dollar bill?
2. John sold 4 Saturday Evening Posts at 5 cents each. He kept $\frac{1}{2}$ the money and with the other $\frac{1}{2}$ he bought Sunday papers at 2 cents each. How many did he buy?
3. If James had 4 times as much money as George, he would have \$16. How much money has George?
4. How many pencils can you buy for 50 cents at the rate of 2 for 5 cents?'
5. The uniforms for a baseball nine cost \$2.50 each. The shoes cost \$2 a pair. What was the total cost of uniforms and shoes for the nine?
6. In the schools of a certain city there are 2200 pupils; $\frac{1}{2}$ are in the primary grades, $\frac{1}{4}$ in the grammar grades, $\frac{1}{8}$ in the high school, and the rest in the night school. How many pupils are there in the night school?
7. If $3\frac{1}{2}$ tons of coal cost \$21, what will $5\frac{1}{2}$ tons cost?
8. A news dealer bought some magazines for \$1. He sold them for \$1.20, gaining 5 cents on each magazine. How many magazines were there?
9. A girl spent $\frac{1}{8}$ of her money for car fare, and three times as much for clothes. Half of what she had left was 80 cents. How much money did she have at first?
10. Two girls receive \$2.10 for making buttonholes. One makes 42, the other 28. How shall they divide the money?
11. Mr. Brown paid one third of the cost of a building; Mr. Johnson paid $\frac{1}{2}$ the cost. Mr. Johnson received \$500 more annual rent than Mr. Brown. How much did each receive?
12. A freight train left Albany for New York at 6 o'clock. An express left on the same track at 8 o'clock. It went at the rate of 40 miles an hour. At what time of day will it overtake the freight train if the freight train stops after it has gone 56 miles?"

The criteria he had in mind in selecting the problems were as follows:—

"The main purpose of the reasoning test is the determination of the ability of VI A children to reason in arithmetic. To this end, the problems, as selected and arranged, are meant to embody the following conditions:—

1. Situations equally concrete to all VI A children.
2. Graduated difficulties.
 - a. As to arithmetical thinking.

In the blank space below, work as many of the following examples as possible in the time allowed. Work them in order as numbered, entering each answer in the "answer" column before commencing a new example. Do not work on any other paper.

1. The children in a certain school gave a Christmas party. One of the presents was a box of candy. In filling the boxes, one grade used 16 pounds of candy, another 17 pounds, a third 12 pounds, and a fourth 13 pounds. What did the candy cost at 26¢. a pound?

2. A school in a certain city used 2516 pieces of chalk in 37 school days. Three new rooms were opened, each room holding 50 children, and the school was then found to use 84 sticks of chalk per day. How many more sticks of chalk were used per day than at first?

3. Several boys went on a bicycle trip of 1500 miles. The first week they rode 374 miles, the second week 264 miles, the third 423 miles, the fourth 401 miles. They finished the trip the next week. How many miles did they ride the last week?

4. Forty-five boys were hired to pick apples from 15 trees in an apple orchard. In 50 minutes each boy had picked 48 choice apples. If all the apples picked were packed away carefully in 8 boxes of equal size, how many apples were put in each box?

5. In a certain school 216 children gave a sleigh-ride party. They rented 7 sleighs at a cost of \$30.00 and paid \$24.00 for the refreshments. The party travelled 15 miles in 2½ hours and had a very pleasant time. What was each child's share of the expense?

6. A girl found, by careful counting, that there

ANSWER	

were 2400 letters on one page of her history, and only 2295 letters on a page of her reader. How many more letters had she read in one book than in the other if she had read 47 pages in each of the books?

7. Each of 59 rooms in the schools of a certain city contributed 25 presents to a Christmas entertainment for poor children. The stores of the city gave 1986 other articles for presents. What was the total number of presents given away at the entertainment?

8. Forty-eight children from a certain school paid 10¢ apiece to ride 7 miles on the cars to a woods. There in a few hours they gathered 2765 nuts. 605 of these were bad, but the rest were shared equally among the children. How many good nuts did each one get?

Total

These proposed measures of ability to apply arithmetic illustrate very nicely the differences of opinion concerning what applied arithmetic and arithmetical reasoning should be. The thinker who emphasizes the fact that in life out of school the situation demanding quantitative treatment is usually real rather than described, will condemn a test all of whose constituents are *described* problems. Unless we are excessively hopeful concerning the transfer of ideas of method and procedure from one mental function to another we shall protest against the artificiality of No. 3 of the Stone series, and of the entire Curtis Test 8 except No. 4. The Curtis speed-reasoning test (No. 6) is a striking example of the mixture of ability to understand quantitative relations with the ability to understand words. Consider these five, for example, in comparison with the revised versions attached.^[3]

1. The children of a school gave a sleigh-ride party. There were 9 sleighs, and each sleigh held 30 children. How many children were there in the party?

REVISION. *If one sleigh holds 30 children, 9 sleighs hold children.*

2. Two school-girls played a number-game. The score of the girl that lost was 57 points and she was beaten by 16 points. What was the score of the girl that won?

REVISION. *Mary and Nell played a game. Mary had a score of 57. Nell beat Mary by 16. Nell had a score of*

3. A girl counted the automobiles that passed a school. The total was 60 in two hours. If the girl saw 27 pass the first hour how many did she see the second?

REVISION. *In two hours a girl saw 60 automobiles. She saw 27 the first hour. She saw the second hour.*

4. On a playground there were five equal groups of children each playing a different game. If there were 75 children all together, how many were there in each group?

REVISION. *75 pounds of salt just filled five boxes. The boxes were exactly alike. There were pounds in a box.*

5. A teacher weighed all the children in a certain grade. One girl weighed 70 pounds. Her older sister was 49 pounds heavier. How many pounds did the sister weigh?

REVISION. *Mary weighs 70 lb. Jane weighs 49 pounds more than Mary. Jane weighs pounds.*

The distinction between a problem described as clearly and simply as possible and the same problem put awkwardly or in ill-known words or willfully obscured should be regarded; and as a rule measurements of ability to apply arithmetic should eschew all needless obscurity or purely linguistic difficulty. For example,

A boy bought a two-cent stamp. He gave the man in the store 10 cents. The right change was cents.

is better as a test than

If a boy, purchasing a two-cent stamp, gave a ten-cent stamp in payment, what change should he be expected to receive in return?

The distinction between the description of a *bona fide* problem that a human being might be called on to solve out of school and the description of imaginary possibilities or puzzles should also be considered. Nos. 3 and 9 of Stone are bad because to frame the problems one must first know the answers, so that in reality there could never be any point in solving them. It is probably safe to say that nobody in the world ever did or ever will or ever should find the number of apples in a box by the task of No. 4 of the Courtis Test 8.

This attaches no blame to Dr. Stone or to Mr. Courtis. Until very recently we were all so used to the artificial problems of the traditional sort that we did not expect anything better; and so blind to the language demands of described problems that we did not see their very great influence. Courtis himself has been active in reform and has pointed out ('13, p. 4 f.) the defects in his Tests 6 and 8.

"Tests Nos. 6 and 8, the so-called reasoning tests, have proved the least satisfactory of the series. The judgments of various teachers and superintendents as to the inequalities of the units in any one test, and of the differences between the different editions of the same test, have proved the need of investigating these questions. Tests of adults in many lines of commercial work have yielded in many cases lower scores than those of the average eighth grade children. At the same time the scores of certain individuals of marked ability have been high, and there appears to be a general relation between ability in these tests and accuracy in the abstract work. The most significant facts, however, have been the difficulties experienced by teachers in attempting to remedy the defects in reasoning. It is certain that the tests measure abilities of value but the abilities are probably not what they seem to be. In an attempt to measure the value of different units, for instance, as many problems as possible were constructed based upon a single situation. Twenty-one varieties were secured by varying the relative form of the question and the relative position of the different phrases. One of these proved nineteen times as hard as another as measured by the number of mistakes made by the children; yet the cause of the difference was merely the changes in the phrasing. This and other facts of the same kind seem to show that Tests 6 and 8 measure mainly the ability to read."

The scientific measurement of the abilities and achievements concerned with applied arithmetic or problem-solving is thus a matter for the future. In the case of described problems a beginning has been made in the series which form a part of the National Intelligence Tests ['20], one of which is shown on page 49 f. In the case of problems with real situations, nothing in systematic form is yet available.

Systematic tests and scales, besides defining the abilities we are to establish and improve, are of very great service in measuring the status and

improvement of individuals and of classes, and the effects of various methods of instruction and of study. They are thus helpful to pupils, teachers, supervisors, and scientific investigators; and are being more and more widely used every year. Information concerning the merits of the different tests, the procedure to follow in giving and scoring them, the age and grade standards to be used in interpreting results, and the like, is available in the manuals of Educational Measurement, such as Curtis, *Manual of Instructions for Giving and Scoring the Curtis Standard Tests in the Three R's* ['14]; Starch, *Educational Measurements* ['16]; Chapman and Rush, *Scientific Measurement of Classroom Products* ['17]; Monroe, DeVoss, and Kelly, *Educational Tests and Measurements* ['17]; Wilson and Hoke, *How to Measure* ['20]; and McCall, *How to Measure in Education* ['21].

National Intelligence Tests.
Scale A. Form 1, Edition 1

TEST 1

Find the answers as quickly as you can.
Write the answers on the dotted lines.
Use the side of the page to figure on.

Begin here

- 1 Five cents make 1 nickel. How many nickels make a dime? *Answer.....*
- 2 John paid 5 dollars for a watch and 3 dollars for a chain. How many dollars did he pay for the watch and chain? *Answer.....*
- 3 Nell is 13 years old. Mary is 9 years old. How much younger is Mary than Nell? *Answer.....*
- 4 One quart of ice cream is enough for 5 persons. How many quarts of ice cream are needed for 25 persons? *Answer.....*
- 5 John's grandmother is 86 years old. If she lives, in how many years will she be 100 years old? *Answer.....*

- 6 If a man gets \$2.50 a day, what will he be paid for six days' work? *Answer.....*
- 7 How many inches are there in a foot and a half? *Answer.....*
- 8 What is the cost of 12 cakes at 6 for 5 cents? *Answer.....*
- 9 The uniforms for a baseball team of nine boys cost \$2.50 each. The shoes cost \$2 a pair. What was the total cost of uniforms and shoes for the nine? *Answer.....*
- 10 A train that usually arrives at half-past ten was 17 minutes late. When did it arrive? *Answer.....*
- 11 At 10¢ a yard, what is the cost of a piece 10½ ft. long? *Answer.....*
- 12 A man earns \$6 a day half the time, \$4.50 a day one fourth of the time, and nothing on the remaining days for a total period of 40 days. What did he earn in all in the 40 days? *Answer.....*
- 13 What per cent of \$800 is 4% of \$1000? *Answer.....*
- 14 If 60 men need 1500 lb. flour per month, what is the requirement per man per day counting a month as 30 days? *Answer.....*
- 15 A car goes at the rate of a mile a minute. A truck goes 20 miles an hour. How many times as far will the car go as the truck in 10 seconds? *Answer.....*
- 16 The area of the base (inside measure) of a cylindrical tank is 90 square feet. How tall must it be to hold 100 cubic yards? *Answer.....*

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CHAPTER III

THE CONSTITUTION OF ARITHMETICAL ABILITIES

THE ELEMENTARY FUNCTIONS OF ARITHMETICAL LEARNING

It would be a useful work for some one to try to analyze arithmetical learning into the unitary abilities which compose it, showing just what, in detail, the mind has to do in order to be prepared to pass a thorough test on the whole of arithmetic. These unitary abilities would make a very long list. Examination of a well-planned textbook will show that such an ability as multiplication is treated as a composite of the following: knowledge of the multiplications up to 9×9 ; ability to multiply two (or more)-place numbers by 2, 3, and 4 when 'carrying' is not required and no zeros occur in the multiplicand; ability to multiply by 2, 3, ... 9, with carrying; the ability to handle zeros in the multiplicand; the ability to multiply with two-place numbers not ending in zero; the ability to handle zero in the multiplier as last number; the ability to multiply with three (or more)-place numbers not including a zero; the ability to multiply with three- and four-place numbers with zero in second or third, or second and third, as well as in last place; the ability to save time by annexing zeros; and so on and on through a long list of further abilities required to multiply with United States money, decimal fractions, common fractions, mixed numbers, and denominate numbers.

The units or 'steps' thus recognized by careful teaching would make a long list, but it is probable that a still more careful study of arithmetical ability as a hierarchy of mental habits or connections would greatly increase the list. Consider, for example, ordinary column addition. The majority of teachers probably treat this as a simple application of the knowledge of the

additions to $9 + 9$, plus understanding of 'carrying.' On the contrary there are at least seven processes or minor functions involved in two-place column addition, each of which is psychologically distinct and requires distinct educational treatment.

These are:—

- A. Learning to keep one's place in the column as one adds.
- B. Learning to keep in mind the result of each addition until the next number is added to it.
- C. Learning to add a seen to a thought-of number.
- D. Learning to neglect an empty space in the columns.
- E. Learning to neglect 0s in the columns.
- F. Learning the application of the combinations to higher decades may for the less gifted pupils involve as much time and labor as learning all the original addition tables. And even for the most gifted child the formation of the connection ' $8 \text{ and } 7 = 15$ ' probably never quite insures the presence of the connections ' $38 \text{ and } 7 = 45$ ' and ' $18 + 7 = 25$.'
- G. Learning to write the figure signifying units rather than the total sum of a column. In particular, learning to write 0 in the cases where the sum of the column is 10, 20, etc. Learning to 'carry' also involves in itself at least two distinct processes, by whatever way it is taught.

We find evidence of such specialization of functions in the results with such tests as Woody's. For example, $2 + 5 + 1 = \dots$ surely involves abilities in part different from

$$\begin{array}{r} 2 \\ 4 \\ 3 \\ \hline \end{array}$$

because only 77 percent of children in grade 3 do the former correctly, whereas 95 percent of children in that grade do the latter correctly. In grade

2 the difference is even more marked. In the case of subtraction

$$\begin{array}{r} 4 \\ 4 \\ \hline \end{array}$$

involves abilities different from those involved in

$$\begin{array}{r} 9 \\ 3 \\ \hline \end{array},$$

being much less often solved correctly in grades 2 and 4.

$$\begin{array}{r} 6 \\ 0 \\ \hline \end{array}$$

is much harder than either of the above.

$$\begin{array}{r} 43 \\ 1 \\ 2 \\ 13 \\ \hline \end{array} \quad \text{is much harder than} \quad \begin{array}{r} 21 \\ 33 \\ 35 \\ \hline \end{array}$$

It may be said that these differences in difficulty are due to different amounts of practice. This is probably not true, but if it were, it would not change the argument; if the two abilities were identical, the practice of one would improve the other equally.

I shall not undertake here this task of listing and describing the elementary functions which constitute arithmetical learning, partly because what they are is not fully known, partly because in many cases a final ability may be constituted in several different ways whose descriptions become necessarily tedious, and partly because an adequate statement of what is known would far outrun the space limits of this chapter. Instead, I shall illustrate the results by some samples.

KNOWLEDGE OF THE MEANING OF A FRACTION

As a first sample, consider knowledge of the meaning of a fraction. Is the ability in question simply to understand that a fraction is a statement of the number of parts, each of a certain size, the upper number or numerator telling how many parts are taken and the lower number or denominator telling what fraction of unity each part is? And is the educational treatment required simply to describe and illustrate such a statement and have the pupils apply it to the recognition of fractions and the interpretation of each of them? And is the learning process (1) the formation of the notions of part, size of part, number of part, (2) relating the last two to the numbers in a fraction, and, as a necessary consequence, (3) applying these notions adequately whenever one encounters a fraction in operation?

Precisely this was the notion a few generations ago. The nature of fractions was taught as one principle, in one step, and the habits of dealing with fractions were supposed to be deduced from the general law of a fraction's nature. As a result the subject of fractions had to be long delayed, was studied at great cost of time and effort, and, even so, remained a mystery to all save gifted pupils. These gifted pupils probably of their own accord built up the ability piecemeal out of constituent insights and habits.

At all events, scientific teaching now does build up the total ability as a fusion or organization of lesser abilities. What these are will be seen best by examining the means taken to get them. (1) First comes the association of $\frac{1}{2}$ of a pie, $\frac{1}{2}$ of a cake, $\frac{1}{2}$ of an apple, and such like with their concrete meanings so that a pupil can properly name a clearly designated half of an obvious unit like an orange, pear, or piece of chalk. The same degree of understanding of $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{3}$, $\frac{1}{6}$, and $\frac{1}{5}$ is secured. The pupil is taught that 1 pie = 2 $\frac{1}{2}$ s, 3 $\frac{1}{3}$ s, 4 $\frac{1}{4}$ s, 5 $\frac{1}{5}$ s, 6 $\frac{1}{6}$ s, and 8 $\frac{1}{8}$ s; similarly for 1 cake, 1 apple, and the like.

So far he understands $\frac{1}{x}$ of y in the sense of certain simple parts of obviously unitary y s.

(2) Next comes the association with $\frac{1}{2}$ of an inch, $\frac{1}{2}$ of a foot, $\frac{1}{2}$ of a glassful and other cases where y is not so obviously a unitary object whose pieces still show their derivation from it. Similarly for $\frac{1}{4}$, $\frac{1}{3}$, etc.

(3) Next comes the association with $\frac{1}{2}$ of a collection of eight pieces of candy, $\frac{1}{3}$ of a dozen eggs, $\frac{1}{5}$ of a squad of ten soldiers, etc., until $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, and $\frac{1}{8}$ are understood as names of certain parts of a collection of objects.

(4) Next comes the similar association when the nature of the collection is left undefined, the pupil responding to

$\frac{1}{2}$ of 6 is ..., $\frac{1}{4}$ of 8 is ..., 2 is $\frac{1}{5}$ of ...,

$\frac{1}{3}$ of 6 is ..., $\frac{1}{3}$ of 9 is ..., 2 is $\frac{1}{3}$ of ..., and the like.

Each of these abilities is justified in teaching by its intrinsic merits, irrespective of its later service in helping to constitute the general understanding of the meaning of a fraction. The habits thus formed in grades 3 or 4 are of constant service then and thereafter in and out of school.

(5) With these comes the use of $\frac{1}{5}$ of 10, 15, 20, etc., $\frac{1}{6}$ of 12, 18, 42, etc., as a useful variety of drill on the division tables, valuable in itself, and a means of making the notion of a unit fraction more general by adding $\frac{1}{7}$ and $\frac{1}{9}$ to the scheme.

(6) Next comes the connection of $\frac{3}{4}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, $\frac{2}{3}$, $\frac{1}{6}$, $\frac{5}{6}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$, $\frac{3}{10}$, $\frac{7}{10}$, and $\frac{9}{10}$, each with its meaning as a certain part of some conveniently divisible unit, and, (7) and (8), connections between these fractions and their meanings as parts of certain magnitudes (7) and collections (8) of convenient size, and (9) connections between these fractions and their meanings when the nature of the magnitude or collection is unstated, as in $\frac{4}{5}$ of 15 = ..., $\frac{5}{8}$ of 32 = ...

(10) That the relation is general is shown by using it with numbers requiring written division and multiplication, such as $\frac{7}{8}$ of 1736 = ..., and with United States money.

Elements (6) to (10) again are useful even if the pupil never goes farther in arithmetic. One of the commonest uses of fractions is in calculating the

cost of fractions of yards of cloth, and fractions of pounds of meat, cheese, etc.

The next step (11) is to understand to some extent the principle that the value of any of these fractions is unaltered by multiplying or dividing the numerator and denominator by the same number. The drills in expressing fractions in lower and higher terms which accomplish this are paralleled by (12) and (13) simple exercises in adding and subtracting fractions to show that fractions are quantities that can be operated on like any quantities, and by (14) simple work with mixed numbers (addition and subtraction and reductions), and (15) improper fractions. All that is done with improper fractions is (*a*) to have the pupil use a few of them as he would any fractions and (*b*) to note their equivalent mixed numbers. In (12), (13), and (14) only fractions of the same denominators are added or subtracted, and in (12) (13), (14), and (15) only fractions with 2, 3, 4, 5, 6, 8, or 10 in the denominator are used. As hitherto, the work of (11) to (15) is useful in and of itself. (16) Definitions are given of the following type:—

Numbers like 2, 3, 4, 7, 11, 20, 36, 140, 921 are called whole numbers.

Numbers like $\frac{7}{8}$, $\frac{1}{5}$, $\frac{2}{3}$, $\frac{3}{4}$, $\frac{11}{8}$, $\frac{7}{6}$, $\frac{1}{3}$, $\frac{4}{3}$, $\frac{1}{8}$, $\frac{1}{6}$ are called fractions.

Numbers like $5\frac{1}{4}$, $7\frac{3}{8}$, $9\frac{1}{2}$, $16\frac{4}{5}$, $315\frac{7}{8}$, $1\frac{1}{3}$, $1\frac{2}{3}$ are called mixed numbers.

(17) The terms numerator and denominator are connected with the upper and lower numbers composing a fraction.

Building this somewhat elaborate series of minor abilities seems to be a very roundabout way of getting knowledge of the meaning of a fraction, and is, if we take no account of what is got along with this knowledge. Taking account of the intrinsically useful habits that are built up, one might retort that the pupil gets his knowledge of the meaning of a fraction at zero cost.

KNOWLEDGE OF THE SUBTRACTION AND DIVISION TABLES

Consider next the knowledge of the subtraction and division 'Tables.' The usual treatment presupposes that learning them consists of forming independently the bonds:—

$$\begin{array}{rcl}
 3 - 1 = 2 & & 4 \div 2 = 2 \\
 3 - 2 = 1 & & 6 \div 2 = 3 \\
 4 - 1 = 3 & & 6 \div 3 = 2 \\
 & \cdot & \cdot \\
 & \cdot & \cdot \\
 & \cdot & \cdot \\
 18 - 9 = 9 & & 81 \div 9 = 9
 \end{array}$$

In fact, however, these 126 bonds are not formed independently. Except perhaps in the case of the dullest twentieth of pupils, they are somewhat facilitated by the already learned additions and multiplications. And by proper arrangement of the learning they may be enormously facilitated thereby. Indeed, we may replace the independent memorizing of these facts by a set of instructive exercises wherein the pupil derives the subtractions from the corresponding additions by simple acts of reasoning or selective thinking. As soon as the additions giving sums of 9 or less are learned, let the pupil attack an exercise like the following:—

Write the missing numbers:—

A	B	C	D
3 and ... are 5.	5 and ... are 8.	4 and ... are 5.	4 and ... are 8.
3 and ... are 9.	3 and ... are 6.	5 and ... are 6.	1 and ... are 7.
4 and ... are 7.	4 and ... are 9.	6 and ... are 9.	6 and ... are 7.
5 and ... are 7.	2 and ... = 6.	1 and ... are 8.	8 and ... are 9.
6 and ... are 8.	5 and ... = 9.	3 and ... are 7.	3 + ... are 4.
4 and ... are 6.	2 and ... = 7.	1 + ... are 3.	7 + ... are 8.

2 and ... are 5.	3 and ... = 8.	1 + ... are 5.	4 + ... are 9.
2 and ... = 8.	1 and ... = 4.	4 + ... are 8.	2 + ... are 3.
3 and ... = 6.	2 and ... = 4.	7 + ... are 9.	1 + ... are 9.
6 and ... = 9.	3 and ... = 8.	2 + ... = 4.	3 + ... = 6.
4 and ... = 6.	6 and ... = 7.	3 + ... = 8.	5 + ... = 9.
4 and ... = 7.	2 and ... = 5.	4 + ... = 5.	1 + ... = 3.

The task for reasoning is only to try, one after another, numbers that seem promising and to select the right one when found. With a little stimulus and direction children can thus derive the subtractions up to those with 9 as the larger number. Let them then be taught to do the same with the printed forms:—

Subtract

9	7	8	5	8	6	
3	5	6	2	2	4	etc.
—	—	—	—	—	—	

and $9 - 7 = \dots$, $9 - 5 = \dots$, $7 - 5 = \dots$, etc.

In the case of the divisions, suppose that the pupil has learned his first table and gained surety in such exercises as:—

4 5s =	$6 \times 5 = \dots$	9 nickels = cents.
8 5s =	$4 \times 5 = \dots$	6 " = "
3 5s =	$2 \times 5 = \dots$	5 " = "
7 5s =	$9 \times 5 = \dots$	7 " = "

If one ball costs 5 cents,
 two balls cost cents,
 three balls cost cents, etc.

He may then be set at once to work at the answers to exercises like the following:—

Write the answers and the missing numbers:—

A	B	C	D
.... 5s = 15	40 = 5s	.... × 5 = 25	20 cents = nickels.
.... 5s = 20	20 = 5s	.... × 5 = 50	30 cents = nickels.
.... 5s = 40	15 = 5s	.... × 5 = 35	15 cents = nickels.
.... 5s = 25	45 = 5s	.... × 5 = 10	40 cents = nickels.
.... 5s = 30	50 = 5s	.... × 5 = 40	
.... 5s = 35	25 = 5s	.... × 5 = 45	

E

For 5 cents you can buy 1 small loaf of bread.
 For 10 cents you can buy 2 small loaves of bread.
 For 25 cents you can buy small loaves of bread.
 For 45 cents you can buy small loaves of bread.
 For 35 cents you can buy small loaves of bread.

F

5 cents pays 1 car fare.
 15 cents pays car fares.
 10 cents pays car fares.
 20 cents pays car fares.

G

How many 5 cent balls can you buy with 30 cents?
 How many 5 cent balls can you buy with 35 cents?
 How many 5 cent balls can you buy with 25 cents?
 How many 5 cent balls can you buy with 15 cents?

In the case of the meaning of a fraction, the ability, and so the learning, is much more elaborate than common practice has assumed; in the case of the subtraction and division tables the learning is much less so. In neither case is the learning either mere memorizing of facts or the mere understanding of a principle *in abstracto* followed by its application to concrete cases. It is (and this we shall find true of almost all efficient learning in arithmetic) the formation of connections and their use in such an order that each helps the others to the maximum degree, and so that each will do the maximum amount for arithmetical abilities other than the one specially concerned, and for the general competence of the learner.

LEARNING THE PROCESSES OF COMPUTATION

As another instructive topic in the constitution of arithmetical abilities, we may take the case of the reasoning involved in understanding the manipulations of figures in two (or more)-place addition and subtraction, multiplication and division involving a two (or more)-place number, and the manipulations of decimals in all four operations. The psychology of these is of special interest and importance. For there are two opposite explanations possible here, leading to two opposite theories of teaching.

The common explanation is that these methods of manipulation, if understood at all, are understood as deductions from the properties of our system of decimal notation. The other is that they are understood partly as inductions from the experience that they always give the right answer. The first explanation leads to the common preliminary deductive explanations of the textbooks. The other leads to explanations by verification; *e.g.*, of addition by counting, of subtraction by addition, of multiplication by addition, of division by multiplication. Samples of these two sorts of explanation are given below.

SHORT MULTIPLICATION WITHOUT CARRYING: DEDUCTIVE EXPLANATION

MULTIPLICATION is the process of taking one number as many times as there are units in another number.

The PRODUCT is the result of the multiplication.

The MULTIPLICAND is the number to be taken.

The MULTIPLIER is the number denoting how many times the multiplicand is to be taken.

The multiplier and multiplicand are the FACTORS.

Multiply 623 by 3

OPERATION

<i>Multiplicand</i>	623
<i>Multiplier</i>	<u>3</u>
<i>Product</i>	1869

EXPLANATION.—For convenience we write the multiplier under the multiplicand, and begin with units to multiply. 3 times 3 units are 9 units. We write the nine units in units' place in the product. 3 times 2 tens are 6 tens. We write the 6 tens in tens' place in the product. 3 times 6 hundreds are 18 hundreds, or 1 thousand and 8 hundreds. The 1 thousand we write in thousands' place and the 8

hundreds in hundreds' place in the product. Therefore, the product is 1 thousand 8 hundreds, 6 tens and 9 units, or 1869.

SHORT MULTIPLICATION WITHOUT CARRYING: INDUCTIVE EXPLANATION

1. The children of the third grade are to have a picnic. 32 are going. How many sandwiches will they need if each of the 32 children has four sandwiches?

Here is a quick way to find out:—

32 *Think "4 × 2," write 8 under the 2 in the ones column.*
4 *Think "4 × 3," write 12 under the 3 in the tens column.*

2. How many bananas will they need if each of the 32 children has two bananas? 32×2 or 2×32 will give the answer.

3. How many little cakes will they need if each child has three cakes? 32×3 or 3×32 will give the answer.

32 $3 \times 2 = \dots$ *Where do you write the 6?*
3 $3 \times 3 = \dots$ *Where do you write the 9?*

4. Prove that 128, 64, and 96 are right by adding four 32s, two 32s, and three 32s.

32
32 32
32 32 32
32 32 32

Multiplication

You **multiply** when you find the answers to questions like

How many are 9×3 ?
How many are 3×32 ?
How many are 8×5 ?
How many are 4×42 ?

1. Read these lines. Say the right numbers where the dots are:
If you **add** 3 to 32, you have 35 is the **sum**.
If you **subtract** 3 from 32, the result is 29 is the **difference** or **remainder**.
If you **multiply** 3 by 32 or 32 by 3, you have 96 is the **product**.

Find the products. Check your answers to the first line by adding.

2.	3.	4.	5.	6.	7.	8.	9.
41	33	42	44	53	43	34	24
<u>3</u>	<u>2</u>	<u>4</u>	<u>2</u>	<u>3</u>	<u>2</u>	<u>2</u>	<u>2</u>

10.	11.	12.	13.	14.	15.	16.
43	52	32	23	41	51	14
<u> 3</u>	<u> 3</u>	<u> 3</u>	<u> 3</u>	<u> 2</u>	<u> 4</u>	<u> 2</u>

17.

$\begin{array}{r} 213 \\ \underline{3} \end{array}$	<p><i>Write the 9 in the ones column.</i></p> <p><i>Write the 6 in the hundreds column.</i></p> <p><i>Write the 3 in the tens column.</i></p>	<p><i>Check your answer by adding.</i></p>	<p>Add</p> $\begin{array}{r} 213 \\ 213 \\ \underline{213} \end{array}$
--	---	--	---

18.	19.	20.	21.	22.	23.	24.
214	312	432	231	132	314	243
<u> 2</u>	<u> 3</u>	<u> 2</u>	<u> 3</u>	<u> 3</u>	<u> 2</u>	<u> 2</u>

SHORT DIVISION: DEDUCTIVE EXPLANATION

Divide 1825 by 4

Divisor 4 | 1825 Dividend
 456¼
 Quotient

EXPLANATION.—For convenience we write the divisor at the left of the dividend, and the quotient below it, and begin at the left to divide. 4 is not contained in 1 thousand any thousand times, therefore the quotient contains no unit of any order higher than hundreds. Consequently we find how many times 4 is contained in the hundreds of the dividend. 1 thousand and 8 hundreds are 18 hundreds. 4 is contained in 18 hundreds 4 hundred times and 2 hundreds remaining. We write the 4 hundreds in the quotient. The 2 hundreds we consider as united with the 2 tens, making 22 tens. 4 is contained in 22 tens 5 tens times, and 2 tens remaining. We write the 5 tens in the quotient, and the remaining 2 tens we consider as united with the 5 units, making 25 units. 4 is contained in 25 units 6 units times and 1 unit remaining. We write the 6 units in the quotient and indicate the division of the remainder, 1 unit, by the divisor 4.

Therefore the quotient of 1825 divided by 4 is 456¼, or 456 and 1 remainder.

SHORT DIVISION: INDUCTIVE EXPLANATION

Dividing Large Numbers

1. Tom, Dick, Will, and Fred put in 2 cents each to buy an eight-cent bag of marbles. There are 128 marbles in it. How many should each boy have, if they divide the marbles equally among the four boys?

4 | 128

Think "12 = three 4s." Write the 3 over the 2 in the tens column.

Think "8 = two 4s." Write the 2 over the 8 in the ones column.

32 is right, because $4 \times 32 = 128$.

2. Mary, Nell, and Alice are going to buy a book as a present for their Sunday-school teacher. The present costs 69 cents. How much should each girl pay, if they divide the cost equally among the three girls?

$$3 \overline{)69}$$

Think "6 = 3s." Write the 2 over the 6 in the tens column.

Think "9 = 3s." Write the 3 over the 9 in the ones column.

23 is right, for $3 \times 23 = 69$.

3. Divide the cost of a 96-cent present equally among three girls. How much should each girl pay? girls. How much should each girl pay? $3 \overline{)96}$

4. Divide the cost of an 84-cent present equally among 4 girls. How much should each girl pay?

5. Learn this: (Read \div as "divided by.")

12 + 4 = 16.	16 is the sum.
12 - 4 = 8.	8 is the difference or remainder.
12 \times 4 = 48.	48 is the product.
12 \div 4 = 3.	3 is the quotient.

6. Find the quotients. Check your answers by multiplying.

$$3 \overline{)99} \quad 2 \overline{)86} \quad 5 \overline{)155} \quad 6 \overline{)246} \quad 4 \overline{)168} \quad 3 \overline{)219}$$

[Uneven division is taught by the same general plan, extended.]

LONG DIVISION: DEDUCTIVE EXPLANATION

To Divide by Long Division

1. Let it be required to divide 34531 by 15.

Operation

	Divided		
Divisor	15) 34531 (	2302 $\frac{1}{15}$	Quotient
	<u>30</u>		
	<u>45</u>		
	<u>45</u>		
	31		
	<u>30</u>		
	1		
	Remainder		

For convenience we write the divisor at the left and the quotient at the right of the dividend, and begin to divide as in Short Division.

15 is contained in 3 ten-thousands 0 ten-thousands times; therefore, there will be 0 ten-thousands in the quotient. Take 34 thousands; 15 is contained in 34 thousands 2 thousands times; we write the 2 thousands in the quotient. 15×2 thousands = 30 thousands, which, subtracted from 34 thousands, leaves 4 thousands = 40 hundreds. Adding the 5 hundreds, we have 45 hundreds.

15 in 45 hundreds 3 hundreds times; we write the 3 hundreds in the quotient. 15×3 hundreds = 45 hundreds, which subtracted from 45 hundreds, leaves nothing. Adding the 3 tens, we have 3 tens.

15 in 3 tens 0 tens times; we write 0 tens in the quotient. Adding to the three tens, which equal 30 units, the 1 unit, we have 31 units.

15 in 31 units 2 units times; we write the 2 units in the quotient. 15×2 units = 30 units, which, subtracted from 31 units, leaves 1 unit as a remainder. Indicating the division of the 1 unit, we annex the fractional expression, $\frac{1}{15}$ unit, to the integral part of the quotient.

Therefore, 34531 divided by 15 is equal to $2302\frac{1}{15}$.

[B. Greenleaf, *Practical Arithmetic*, '73, p. 49.]

LONG DIVISION: INDUCTIVE EXPLANATION

Dividing by Large Numbers

1. Just before Christmas Frank's father sent 360 oranges to be divided among the children in Frank's class. There are 29 children. How many oranges should each child receive? How many oranges will be left over?

Here is the best way to find out:

$$\begin{array}{r} 12 \\ 29 \overline{)360} \\ \underline{29} \\ 70 \\ \underline{58} \\ 12 \end{array}$$

*and 12
remainder*

Think how many 29s there are in 36. 1 is right.

Write 1 over the 6 of 36. Multiply 29 by 1.

Write the 29 under the 36. Subtract 29 from 36.

Write the 0 of 360 after the 7.

Think how many 29s there are in 70. 2 is right.

Write 2 over the 0 of 360. Multiply 29 by 2.

Write the 58 under 70. Subtract 58 from 70.

There is 12 remainder.

Each child gets 12 oranges, and there are 12 left over. This is right, for 12 multiplied by 29 = 348, and 348 + 12 = 360.

$$\begin{array}{r} 8. \\ 31 \overline{) 99,587} \end{array}$$

In No. 8, keep on dividing by 31 until you have used the 5, the 8, and the 7, and have four figures in the quotient.

$$\begin{array}{r} 9. \\ 22 \overline{) 253} \end{array}$$

$$\begin{array}{r} 10. \\ 22 \overline{) 2895} \end{array}$$

$$\begin{array}{r} 11. \\ 21 \overline{) 8891} \end{array}$$

$$\begin{array}{r} 12. \\ 22 \overline{) 290} \end{array}$$

$$\begin{array}{r} 13. \\ 32 \overline{) 16,368} \end{array}$$

Check your results for 9, 10, 11, 12, and 13.

1. The boys and girls of the Welfare Club plan to earn money to buy a victrola. There are 23 boys and girls. They can get a good second-hand victrola for \$5.75. How much must each earn if they divide the cost equally?

Here is the best way to find out:

$$\begin{array}{r} \$.25 \\ 23 \overline{) \$5.75} \\ \underline{46} \\ 115 \\ \underline{115} \end{array}$$

Think how many 23s there are in 57. 2 is right.

Write 2 over the 7 of 57. Multiply 23 by 2.

Write 46 under 57 and subtract. Write the 5 of 575 after the 11.

Think how many 23s there are in 115. 5 is right.

Write 5 over the 5 of 575. Multiply 23 by 5.

Write the 115 under the 115 that is there and subtract.

There is no remainder.

Put \$ and the decimal point where they belong.

Each child must earn 25 cents. This is right, for \$.25 multiplied by 23 = \$5.75.

2. Divide \$71.76 equally among 23 persons. How much is each person's share?

3. Check your result for No. 2 by multiplying the quotient by the divisor.

Find the quotients. Check each quotient by multiplying it by the divisor.

$$\begin{array}{r} 4. \\ 23 \overline{) \$99.13} \end{array}$$

$$\begin{array}{r} 5. \\ 25 \overline{) \$18.50} \end{array}$$

$$\begin{array}{r} 6. \\ 21 \overline{) \$129.15} \end{array}$$

$$\begin{array}{r} 7. \\ 13 \overline{) \$29.25} \end{array}$$

$$\begin{array}{r} 8. \\ 32 \overline{) \$73.92} \end{array}$$

1 bushel = 32 qt.

9. How many bushels are there in 288 qt.? 10. In 192 qt.? 11. In 416 qt.?

Crucial experiments are lacking, but there are several lines of well-attested evidence. First of all, there can be no doubt that the great majority of pupils learn these manipulations at the start from the placing of units under units, tens under tens, etc., in addition, to the placing of the decimal point in division with decimals, by imitation and blind following of specific instructions, and that a very large proportion of the pupils do not to the end, that is to the fifth school-year, understand them as necessary deductions from decimal notation. It also seems probable that this proportion would not be much reduced no matter how ingeniously and carefully the deductions were explained by textbooks and teachers. Evidence of this fact will appear abundantly to any one who will observe schoolroom life. It also appears in the fact that after the properties of the decimal notation have been thus used again and again; *e.g.*, for deducing 'carrying' in addition, 'borrowing' in subtraction, 'carrying' in multiplication, the value of the digits in the partial product, the value of each remainder in short division, the value of the quotient figures in division, the addition, subtraction, multiplication, and division of United States money, and the placing of the decimal point in multiplication, no competent teacher dares to rely upon the pupil, even though he now has four or more years' experience with decimal notation, to deduce the placing of the decimal point in division with decimals. It may be an illusion, but one seems to sense in the better textbooks a recognition of the futility of the attempt to secure deductive derivations of those manipulations. I refer to the brevity of the explanations and their insertion in such a form that they will influence the pupils' thinking as little as possible. At any rate the fact is sure that most pupils do not learn the manipulations by deductive reasoning, or understand them as necessary consequences of abstract principles.

It is a common opinion that the only alternative is knowing them by rote. This, of course, is one common alternative, but the other explanation suggests that understanding the manipulations by inductive reasoning from their results is another and an important alternative. The manipulations of 'long' multiplication, for instance, learned by imitation or mechanical drill, are found to give for $25 \times A$ a result about twice as large as for $13 \times A$, for 38 or $39 \times A$ a result about three times as large; for $115 \times A$ a result about ten times as large as for $11 \times A$. With even the very dull pupils the procedure is verified at least to the extent that it gives a result which the

scientific expert in the case—the teacher—calls right. With even the very bright pupils, who can appreciate the relation of the procedure to decimal notation, this relation may be used not as the sole deduction of the procedure beforehand, but as one partial means of verifying it afterward. Or there may be the condition of half-appreciation of the relation in which the pupil uses knowledge of the decimal notation to convince himself that the procedure *does*, but not that it *must* give the right answer, the answer being 'right' because the teacher, the answer-list, and collateral evidence assure him of it.

I have taken the manipulation of the partial products as an illustration because it is one of the least favored cases for the explanation I am presenting. If we take the first case where a manipulation may be deduced from decimal notation, known merely by rote, or verified inductively, namely, the addition of two-place numbers, it seems sure that the mental processes just described are almost the universal rule.

Surely in our schools at present children add the 3 of 23 to the 3 of 53 and the 2 of 23 to the 5 of 53 at the start, in nine cases out of ten because they see the teacher do so and are told to do so. They are protected from adding $3 + 3 + 2 + 5$ not by any deduction of any sort but because they do not know how to add 8 and 5, because they have been taught the habit of adding figures that stand one above the other, or with a + between them; and because they are shown or told what they are to do. They are protected from adding $3 + 5$ and $2 + 3$, again, by no deductive reasoning but for the second and third reasons just given. In nine cases out of ten they do not even think of the possibility of adding in any other way than the '3 + 3, 2 + 5' way, much less do they select that way on account of the facts that $53 = 50 + 3$ and $23 = 20 + 3$, that $50 + 20 = 70$, that $3 + 3 = 6$, and that $(a + b) + (c + d) = (a + c) + (b + d)$!

Just as surely all but the very dullest twentieth or so of children come in the end to something more than rote knowledge,—to *understand*, to *know* that the procedure in question is right.

Whether they know *why* 76 is right depends upon what is meant by *why*. If it means that 76 is the result which competent people agree upon, they do. If it means that 76 is the result which would come from accurate

counting they perhaps know why as well as they would have, had they been given full explanations of the relation of the procedure in two-place addition to decimal notation. If *why* means because $53 = 50 + 3$, $23 = 20 + 3$, $50 + 20 = 70$, and $(a + b) + (c + d) = (a + c) + (b + d)$, they do not. Nor, I am tempted to add, would most of them by any sort of teaching whatever.

I conclude, therefore, that school children may and do reason about and understand the manipulations of numbers in this inductive, verifying way without being able to, or at least without, under present conditions, finding it profitable to derive them deductively. I believe, in fact, that pure arithmetic *as it is learned and known* is largely an *inductive science*. At one extreme is a minority to whom it is a series of deductions from principles; at the other extreme is a minority to whom it is a series of blind habits; between the two is the great majority, representing every gradation but centering about the type of the inductive thinker.

CHAPTER IV

THE CONSTITUTION OF ARITHMETICAL ABILITIES (CONTINUED): THE SELECTION OF THE BONDS TO BE FORMED

When the analysis of the mental functions involved in arithmetical learning is made thorough it turns into the question, 'What are the elementary bonds or connections that constitute these functions?' and when the problem of teaching arithmetic is regarded, as it should be in the light of present psychology, as a problem in the development of a hierarchy of intellectual habits, it becomes in large measure a problem of the choice of the bonds to be formed and of the discovery of the best order in which to form them and the best means of forming each in that order.

THE IMPORTANCE OF HABIT-FORMATION

The importance of habit-formation or connection-making has been grossly underestimated by the majority of teachers and writers of textbooks. For, in the first place, mastery by deductive reasoning of such matters as 'carrying' in addition, 'borrowing' in subtraction, the value of the digits in the partial products in multiplication, the manipulation of the figures in division, the placing of the decimal point after multiplication or division with decimals, or the manipulation of the figures in the multiplication and division of fractions, is impossible or extremely unlikely in the case of children of the ages and experience in question. They do not as a rule deduce the method of manipulation from their knowledge of decimal notation. Rather they learn about decimal notation by carrying, borrowing, writing the last figure of each partial product under the multiplier which gives that product, etc. They learn the method of manipulating numbers by

seeing them employed, and by more or less blindly acquiring them as associative habits.

In the second place, we, who have already formed and long used the right habits and are thereby protected against the casual misleadings of unfortunate mental connections, can hardly realize the force of mere association. When a child writes sixteen as 61, or finds 428 as the sum of

15
19
16
18

or gives 642 as an answer to 27×36 , or says that 4 divided by $\frac{1}{4} = 1$, we are tempted to consider him mentally perverse, forgetting or perhaps never having understood that he goes wrong for exactly the same general reason that we go right; namely, the general law of habit-formation. If we study the cases of 61 for 16, we shall find them occurring in the work of pupils who after having been drilled in writing 26, 36, 46, 62, 63, and so on, in which the order of the six in writing is the same as it is in speech, return to writing the 'teen numbers. If our language said onety-one for eleven and onety-six for sixteen, we should probably never find such errors except as 'lapses' or as the results of misperception or lack of memory. They would then be more frequent *before* the 20s, 30s, etc., were learned.

If pupils are given much drill on written single column addition involving the higher decades (each time writing the two-figure sum), they are forming a habit of writing 28 after the sum of 8, 6, 9, and 5 is reached; and it should not surprise us if the pupil still occasionally writes the two-figure sum for the first column though a second column is to be added also. On the contrary, unless some counter force influences him, he is absolutely sure to make this mistake.

The last mistake quoted ($4 \div \frac{1}{4} = 1$) is interesting because here we have possibly one of the cases where deduction from psychology alone can give constructive aid to teaching. Multiplication and division by fractions have been notorious for their difficulty. The former is now alleviated by using *of* instead of \times until the new habit is fixed. The latter is still approached with

elaborate caution and with various means of showing why one must 'invert and multiply' or 'multiply by the reciprocal.'

But in the author's opinion it seems clear that the difficulty in multiplying and dividing by a fraction was not that children felt any logical objections to canceling or inverting. I fancy that the majority of them would cheerfully invert any fraction three times over or cancel numbers at random in a column if they were shown how to do so. But if you are a youngster inexperienced in numerical abstractions and if you have had *divide* connected with 'make smaller' three thousand times and never once connected with 'make bigger,' you are sure to be somewhat impelled to make the number smaller the three thousand and first time you are asked to divide it. Some of my readers will probably confess that even now they feel a slight irritation or doubt in saying or writing that $\frac{16}{1} \div \frac{1}{8} = 128$.

The habits that have been confirmed by every multiplication and division by integers are, in this particular of '*the ratio of result to number operated upon,*' directly opposed to the formation of the habits required with fractions. And that is, I believe, the main cause of the difficulty. Its treatment then becomes easy, as will be shown later.

These illustrations could be added to almost indefinitely, especially in the case of the responses made to the so-called 'catch' problems. The fact is that the learner rarely can, and almost never does, survey and analyze an arithmetical situation and justify what he is going to do by articulate deductions from principles. He usually feels the situation more or less vaguely and responds to it as he has responded to it or some situation like it in the past. Arithmetic is to him not a logical doctrine which he applies to various special instances, but a set of rather specialized habits of behavior toward certain sorts of quantities and relations. And in so far as he does come to know the doctrine it is chiefly by doing the will of the master. This is true even with the clearest expositions, the wisest use of objective aids, and full encouragement of originality on the pupil's part.

Lest the last few paragraphs be misunderstood, I hasten to add that the psychologists of to-day do not wish to make the learning of arithmetic a mere matter of acquiring thousands of disconnected habits, nor to decrease by one jot the pupil's genuine comprehension of its general truths. They

wish him to reason not less than he has in the past, but more. They find, however, that you do not secure reasoning in a pupil by demanding it, and that his learning of a general truth without the proper development of organized habits back of it is likely to be, not a rational learning of that general truth, but only a mechanical memorizing of a verbal statement of it. They have come to know that reasoning is not a magic force working in independence of ordinary habits of thought, but an organization and coöperation of those very habits on a higher level.

The older pedagogy of arithmetic stated a general law or truth or principle, ordered the pupil to learn it, and gave him tasks to do which he could not do profitably unless he understood the principle. It left him to build up himself the particular habits needed to give him understanding and mastery of the principle. The newer pedagogy is careful to help him build up these connections or bonds ahead of and along with the general truth or principle, so that he can understand it better. The older pedagogy commanded the pupil to reason and let him suffer the penalty of small profit from the work if he did not. The newer provides instructive experiences with numbers which will stimulate the pupil to reason so far as he has the capacity, but will still be profitable to him in concrete knowledge and skill, even if he lacks the ability to develop the experiences into a general understanding of the principles of numbers. The newer pedagogy secures more reasoning in reality by not pretending to secure so much.

The newer pedagogy of arithmetic, then, scrutinizes every element of knowledge, every connection made in the mind of the learner, so as to choose those which provide the most instructive experiences, those which will grow together into an orderly, rational system of thinking about numbers and quantitative facts. It is not enough for a problem to be a test of understanding of a principle; it must also be helpful in and of itself. It is not enough for an example to be a case of some rule; it must help review and consolidate habits already acquired or lead up to and facilitate habits to be acquired. Every detail of the pupil's work must do the maximum service in arithmetical learning.

DESIRABLE BONDS NOW OFTEN NEGLECTED

As hitherto, I shall not try to list completely the elementary bonds that the course of study in arithmetic should provide for. The best means of preparing the student of this topic for sound criticism and helpful invention is to let him examine representative cases of bonds now often neglected which should be formed and representative cases of useless, or even harmful, bonds now often formed at considerable waste of time and effort.

(1) *Numbers as measures of continuous quantities.*—The numbers one, two, three, 1, 2, 3, etc., should be connected soon after the beginning of arithmetic each with the appropriate amount of some continuous quantity like length or volume or weight, as well as with the appropriate sized collection of apples, counters, blocks, and the like. Lines should be labeled 1 foot, 2 feet, 3 feet, etc.; one inch, two inches, three inches, etc.; weights should be lifted and called one pound, two pounds, etc.; things should be measured in glassfuls, handfuls, pints, and quarts. Otherwise the pupil is likely to limit the meaning of, say, *four* to four sensibly discrete things and to have difficulty in multiplication and division. Measuring, or counting by insensibly marked off repetitions of a unit, binds each number name to its meaning as — *times whatever 1 is*, more surely than mere counting of the units in a collection can, and should reënforce the latter.

(2) *Additions in the higher decades.*—In the case of all save the very gifted children, the additions with higher decades—that is, the bonds, $16 + 7 = 23$, $26 + 7 = 33$, $36 + 7 = 43$, $14 + 8 = 22$, $24 + 8 = 32$, and the like—need to be specifically practiced until the tendency becomes generalized. 'Counting' by 2s beginning with 1, and with 2, counting by 3s beginning with 1, with 2, and with 3, counting by 4s beginning with 1, with 2, with 3, and with 4, and so on, make easy beginnings in the formation of the decade connections. Practice with isolated bonds should soon be added to get freer use of the bonds. The work of column addition should be checked for accuracy so that a pupil will continually get beneficial practice rather than 'practice in error.'

(3) *The uneven divisions.*—The quotients with remainders for the divisions of every number to 19 by 2, every number to 29 by 3, every number to 39 by 4, and so on should be taught as well as the even divisions. A table like the following will be found a convenient means of making these connections:—

$$\begin{aligned}
10 &= \dots 2s \\
10 &= \dots 3s \text{ and } \dots \text{ rem.} \\
10 &= \dots 4s \text{ and } \dots \text{ rem.} \\
10 &= \dots 5s \\
11 &= \dots 2s \text{ and } \dots \text{ rem.} \\
11 &= \dots 3s \text{ and } \dots \text{ rem.} \\
&\cdot \\
&\cdot \\
&\cdot \\
89 &= \dots 9s \text{ and } \dots \text{ rem.}
\end{aligned}$$

These bonds must be formed before short division can be efficient, are useful as a partial help toward selection of the proper quotient figures in long division, and are the chief instruments for one of the important problem series in applied arithmetic,—“How many x s can I buy for y cents at z cents per x and how much will I have left?” That these bonds are at present sadly neglected is shown by Kirby ['13], who found that pupils in the last half of grade 3 and the first half of grade 4 could do only about four such examples per minute (in a ten-minute test), and even at that rate made far from perfect records, though they had been taught the regular division tables. Sixty minutes of practice resulted in a gain of nearly 75 percent in number done per minute, with an increase in accuracy as well.

(4) *The equation form.*—The equation form with an unknown quantity to be determined, or a missing number to be found, should be connected with its meaning and with the problem attitude long before a pupil begins algebra, and in the minds of pupils who never will study algebra.

Children who have just barely learned to add and subtract learn easily to do such work as the following:—

Write the missing numbers:—

$$\begin{aligned}
4 + 8 &= \dots \\
5 + \dots &= 14 \\
\dots + 3 &= 11 \\
\dots &= 5 + 2 \\
16 &= 7 + \dots \\
12 &= \dots + 5
\end{aligned}$$

The equation form is the simplest uniform way yet devised to state a quantitative issue. It is capable of indefinite extension if certain easily understood conventions about parentheses and fraction signs are learned. It should be

employed widely in accounting and the treatment of commercial problems, and would be except for outworn conventions. It is a leading contribution of algebra to business and industrial life. Arithmetic can make it nearly as well. It saves more time in the case of drills on reducing fractions to higher and lower terms alone than is required to learn its meaning and use. To rewrite a quantitative problem as an equation and then make the easy selection of the necessary technique to solve the equation is one of the most universally useful intellectual devices known to man. The words 'equals,' 'equal,' 'is,' 'are,' 'makes,' 'make,' 'gives,' 'give,' and their rarer equivalents should therefore early give way on many occasions to the '=' which so far surpasses them in ultimate convenience and simplicity.

(5) *Addition and subtraction facts in the case of fractions.*—In the case of adding and subtracting fractions, certain specific bonds—between the situation of halves and thirds to be added and the responses of thinking of the numbers as equal to so many sixths, between the situation thirds and fourths to be added and thinking of them as so many twelfths, between fourths and eighths to be added and thinking of them as eighths, and the like—should be formed separately. The general rule of thinking of fractions as their equivalents with some convenient denominator should come as an organization and extension of such special habits, not as an edict from the textbook or teacher.

(6) *Fractional equivalents.*—Efficiency requires that in the end the much used reductions should be firmly connected with the situations where they are needed. They may as well, therefore, be so connected from the beginning, with the gain of making the general process far easier for the dull pupils to master. We shall see later that, for all save the very gifted pupils, the economical way to get an understanding of arithmetical principles is not, usually, to learn a rule and then apply it, but to perform instructive operations and, in the course of performing them, to get insight into the principles.

(7) *Protective habits in multiplying and dividing with fractions.*—In multiplying and dividing with fractions special bonds should be formed to counteract the now harmful influence of the 'multiply = get a larger number' and 'divide = get a smaller number' bonds which all work with integers has been reënforcing.

For example, at the beginning of the systematic work with multiplication by a fraction, let the following be printed clearly at the top of every relevant page of the textbook and displayed on the blackboard:—

When you multiply a number by anything more than 1 the result is larger than the number.

When you multiply a number by 1 the result is the same as the number.

When you multiply a number by anything less than 1 the result is smaller than the number.

Let the pupils establish the new habit by many such exercises as:—

$18 \times 4 = \dots$	$9 \times 2 = \dots$
$4 \times 4 = \dots$	$6 \times 2 = \dots$
$2 \times 4 = \dots$	$3 \times 2 = \dots$
$1 \times 4 = \dots$	$1 \times 2 = \dots$
$\frac{1}{2} \times 4 = \dots$	$\frac{1}{3} \times 2 = \dots$
$\frac{1}{4} \times 4 = \dots$	$\frac{1}{6} \times 2 = \dots$
$\frac{1}{8} \times 4 = \dots$	$\frac{1}{9} \times 2 = \dots$

In the case of division by a fraction the old harmful habit should be counteracted and refined by similar rules and exercises as follows:—

When you divide a number by anything more than 1 the result is smaller than the number.

When you divide a number by 1 the result is the same as the number.

When you divide a number by anything less than 1 the result is larger than the number.

State the missing numbers:—

$8 = \dots 4s$	$12 = \dots 6s$	$9 = \dots 9s$	
$8 = \dots 2s$	$12 = \dots 4s$	$9 = \dots 3s$	
$8 = \dots 1s$	$12 = \dots 3s$	$9 = \dots 1s$	
$8 = \dots \frac{1}{2}s$	$12 = \dots 2s$	$9 = \dots \frac{1}{3}s$	
$8 = \dots \frac{1}{4}s$	$12 = \dots 1s$	$9 = \dots \frac{1}{9}s$	
$8 = \dots \frac{1}{8}s$	$12 = \dots \frac{1}{2}s$		
	$12 = \dots \frac{1}{3}s$		
	$12 = \dots \frac{1}{4}s$		
$16 \div 16$	$9 \div 9$	$10 \div 10$	$12 \div 6$
=	=	=	=
$16 \div 8$	$9 \div 3$	$10 \div 5$	$12 \div 4$
=	=	=	=
$16 \div 4$	$9 \div 1$	$10 \div 1$	$12 \div 3$
=	=	=	=

$16 \div 2$	$9 \div \frac{1}{3}$	$10 \div \frac{1}{5}$	$12 \div 2$
=	=	=	=
$16 \div 1$	$9 \div \frac{1}{9}$	$10 \div \frac{1}{10}$	$12 \div 1$
=	=	=	=
$16 \div \frac{1}{2}$			$12 \div \frac{1}{2}$
=			=
$16 \div \frac{1}{4}$			$12 \div \frac{1}{3}$
=			=
$16 \div \frac{1}{8}$			$12 \div \frac{1}{4}$
=			=
			$12 \div \frac{1}{6}$
			=

(8) *'% of means hundredths times.'*—In the case of percentage a series of bonds like the following should be formed:—

5	percent	of	=	.05 times
20	" "	"	=	.20 "
6	" "	"	=	.06 "
25	%	"	=	.25 ×
12	%	"	=	.12 ×
3	%	"	=	.03 ×

Four five-minute drills on such connections between 'x percent of' and 'its decimal equivalent times' are worth an hour's study of verbal definitions of the meaning of percent as per hundred or the like. The only use of the study of such definitions is to facilitate the later formation of the bonds, and, with all save the brighter pupils, the bonds are more needed for an understanding of the definitions than the definitions are needed for the formation of the bonds.

(9) *Habits of verifying results.*—Bonds should early be formed between certain manipulations of numbers and certain means of checking, or verifying the correctness of, the manipulation in question. The additions to $9 + 9$ and the subtractions to $18 - 9$ should be verified by objective addition and subtraction and counting until the pupil has sure command; the multiplications to 9×9 should be verified by objective multiplication and counting of the result (in piles of tens and a pile of ones) eight or ten times,^[4] and by addition eight or ten times;^[4] the divisions to $81 \div 9$ should be verified by multiplication and occasionally objectively until the pupil has sure command; column addition should be checked

by adding the columns separately and adding the sums so obtained, and by making two shorter tasks of the given task and adding the two sums; 'short' multiplication should be verified eight or ten times by addition; 'long' multiplication should be checked by reversing multiplier and multiplicand and in other ways; 'short' and 'long' division should be verified by multiplication.

These habits of testing an obtained result are of threefold value. They enable the pupil to find his own errors, and to maintain a standard of accuracy by himself. They give him a sense of the relations of the processes and the reasons why the right ways of adding, subtracting, multiplying, and dividing are right, such as only the very bright pupils can get from verbal explanations. They put his acquisition of a certain power, say multiplication, to a real and intelligible use, in checking the results of his practice of a new power, and so instill a respect for arithmetical power and skill in general. The time spent in such verification produces these results at little cost; for the practice in adding to verify multiplications, in multiplying to verify divisions, and the like is nearly as good for general drill and review of the addition and multiplication themselves as practice devised for that special purpose.

Early work in adding, subtracting, and reducing fractions should be verified by objective aids in the shape of lines and areas divided in suitable fractional parts. Early work with decimal fractions should be verified by the use of the equivalent common fractions for .25, .75, .125, .375, and the like. Multiplication and division with fractions, both common and decimal, should in the early stages be verified by objective aids. The placing of the decimal point in multiplication and division with decimal fractions should be verified by such exercises as:—

$$1.23 \overline{) 24.60} \\ \underline{246} $$

It cannot be 200; for 200×1.23 is much more than 24.6.

It cannot be 2; for 2×1.23 is much less than 24.6.

The establishment of habits of verifying results and their use is very greatly needed. The percentage of wrong answers in arithmetical work in schools is now so high that the pupils are often being practiced in error. In many cases they can feel no genuine and effective confidence in the processes, since their own use of the processes brings wrong answers as often as right. In solving problems they often cannot decide whether they have done the right thing or the wrong, since even if they have done the right thing, they may have done it inaccurately. A wrong answer to a problem is therefore too often ambiguous and uninformative to them.^[5]

These illustrations of the last few pages are samples of the procedures recommended by a consideration of all the bonds that one might form and of the contribution that each would make toward the abilities that the study of arithmetic should develop and improve. It is by doing more or less at haphazard what psychology teaches us to do deliberately and systematically in this respect that many of the past advances in the teaching of arithmetic have been made.

WASTEFUL AND HARMFUL BONDS

A scrutiny of the bonds now formed in the teaching of arithmetic with questions concerning the exact service of each, results in a list of bonds of small value or even no value, so far as a psychologist can determine. I present here samples of such psychologically unjustifiable bonds with some of the reasons for their deficiencies.

(1) *Arbitrary units.*—In drills intended to improve the ability to see and use the meanings of numbers as names for ratios or relative magnitudes, it is unwise to employ entirely arbitrary units. The procedure in II (on page 84) is better than that in I. Inches, half-inches, feet, and centimeters are better as units of length than arbitrary As. Square inches, square centimeters, and square feet are better for areas. Ounces and pounds should be lifted rather than arbitrary weights. Pints, quarts, glassfuls, cupfuls, handfuls, and cubic inches are better for volume.

All the real merit in the drills on relative magnitude advocated by Speer, McLellan and Dewey, and others can be secured without spending time in relating magnitudes for the sake of relative magnitude alone. The use of units of measure in drills which will never be used in *bona fide* measuring is like the use of fractions like sevenths, elevenths, and thirteenths. A very little of it is perhaps desirable to test the appreciation of certain general principles, but for regular training it should give place to the use of units of practical significance.

A —————

B —————

C —————

D —————

FIG. 3.

I. If A is 1 which line is 2? Which line is 4? Which line is 3? A and C together equal what line? A and B together equal what line? How much longer is B than A ? How much longer is B than C ? How much longer is D than A ?

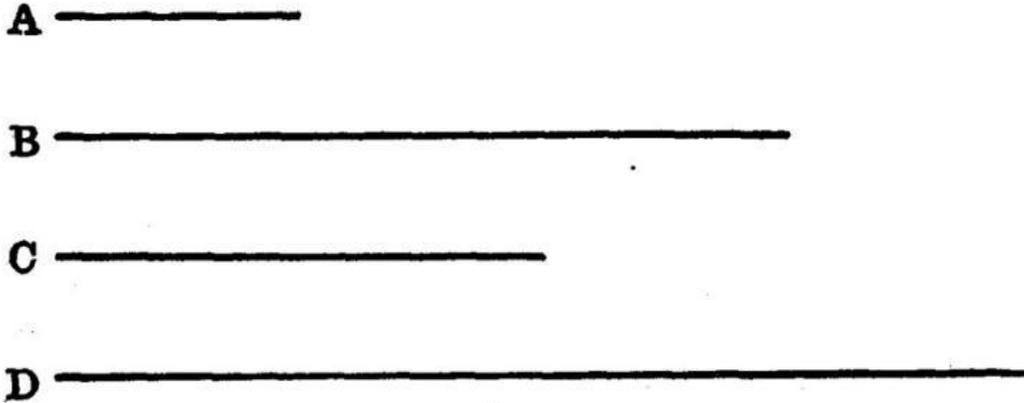


FIG. 4.

II. A is 1 inch long. Which line is 2 inches long? Which line is 4 inches long? Which line is 3 inches long? A and C together make ... inches? A and B together make ... inches? B is longer than A ? B is longer than C ? D is longer than A ?

(2) *Multiples of 11.*—The multiplications of 2 to 12 by 11 and 12 as single connections should be left for the pupil to acquire by himself as he needs them. These connections interfere with the process of learning two-place multiplication. The manipulations of numbers there required can be learned much more easily if 11 and 12 are used as multipliers in just the same way that 78 or 96 would be. Later the 12×2 , 12×3 , etc., may be taught. There is less reason for knowing the multiples of 11 than for knowing the multiples of 15, 16, or 25.

(3) *Abstract and concrete numbers.*—The elaborate emphasis of the supposed fact that we cannot multiply 726 by 8 dollars and the still more elaborate explanations of why nevertheless we find the cost of 726 articles at \$8 each by multiplying 726 by 8 and calling the answer dollars are wasteful. The same holds of the corresponding pedantry about division. These imaginary difficulties should not be raised at all. The pupil should not think of multiplying or dividing men or dollars, but simply of the necessary equation and of the sort of thing that the missing number represents. " $8 \times 726 = \dots$ Answer is dollars," or "8, 726, multiply. Answer is dollars," is all that he needs to think, and is in the best form for his thought. Concerning the distinction between abstract and concrete numbers, both

logic and common sense as well as psychology support the contention of McDougale ['14, p. 206f.], who writes:—

"The most elementary counting, even that stage when the counts were not carried in the mind, but merely in notches on a stick or by DeMorgan's stones in a pot, requires some thought; and the most advanced counting implies memory of things. The terms, therefore, abstract and concrete number, have long since ceased to be used by thinking people.

"Recently the writer visited an arithmetic class in a State Normal School and saw a group of practically adult students confused about this very question concerning abstract and concrete numbers, according to their previous training in the conventionalities of the textbook. Their teacher diverted the work of the hour and she and the class spent almost the whole period in reestablishing the requirements 'that the product must always be the same kind of unit as the multiplicand,' and 'addends must all be alike to be added.' This is not an exceptional case. Throughout the whole range of teaching arithmetic in the public schools pupils are obfuscated by the philosophical encumbrances which have been imposed upon the simplest processes of numerical work. The time is surely ripe, now that we are readjusting our ideas of the subject of arithmetic, to revise some of these wasteful and disheartening practices. Algebra historically grew out of arithmetic, yet it has not been laden with this distinction. No pupil in algebra lets x equal the horses; he lets x equal the *number* of horses, and proceeds to drop the idea of horses out of his consideration. He multiplies, divides, and extracts the root of the *number*, sometimes handling fractions in the process, and finally interprets the result according to the conditions of his problem. Of course, in the early number work there have been the sense-objects from which number has been perceived, but the mind retreats naturally from objectivity to the pure conception of number, and then to the number symbol. The following is taken from the appendix to Horn's thesis, where a seventh grade girl gets the population of the United States in 1820:—

7,862,166	whites
233,634	free negroes
<u>1,538,022</u>	slaves
9,633,822	

In this problem three different kinds of addends are combined, if we accept the usual distinction. Some may say that this is a mistake,—that the pupil transformed the 'whites,' 'free negroes,' and 'slaves' into a common unit, such as 'people' of 'population' and then added these common units. But this 'explanation' is entirely gratuitous, as one will find if he questions the pupil about the process. It will be

found that the child simply added the figures as numbers only and then interpreted the result, according to the statement of the problem, without so much mental gymnastics. The writer has questioned hundreds of students in Normal School work on this point, and he believes that the ordinary mind-movement is correctly set forth here, no matter how well one may maintain as an academic proposition that this is not logical. Many classes in the Eastern Kentucky State Normal have been given this problem to solve, and they invariably get the same result:—

'In a garden on the Summit are as many cabbage-heads as the total number of ladies and gentlemen in this class. How many cabbage-heads in the garden?'

And the blackboard solution looks like this each time:—

$$\begin{array}{r} 29 \quad \text{ladies} \\ 15 \quad \text{gentlemen} \\ \hline 44 \quad \text{cabbage-heads} \end{array}$$

So, also, one may say: I have 6 times as many sheep as you have cows. If you have 5 cows, how many sheep have I? Here we would multiply the number of cows, which is 5, by 6 and call the result 30, which must be linked with the idea of sheep because the conditions imposed by the problem demand it. The mind naturally in this work separates the pure number from its situation, as in algebra, handles it according to the laws governing arithmetical combinations, and labels the result as the statement of the problem demands. This is expressed in the following, which is tacitly accepted in algebra, and should be accepted equally in arithmetic:

'In all computations and operations in arithmetic, all numbers are essentially abstract and should be so treated. They are concrete only in the thought process that attends the operation and interprets the result.'

(4) *Least common multiple*.—The whole set of bonds involved in learning 'least common multiple' should be left out. In adding and subtracting fractions the pupil should *not* find the least common multiple of their denominators but should find any common multiple that he can find quickly and correctly. No intelligent person would ever waste time in searching for the least common multiple of sixths, thirds, and halves except for the unfortunate traditions of an oversystematized arithmetic, but would think of their equivalents in sixths or twelfths or twenty-fourths or *any other convenient common multiple*. The process of finding the least common multiple is of such exceedingly rare application in science or business or life generally that the textbooks have to resort to purely fantastic problems to give drill in its use.

(5) *Greatest common divisor*.—The whole set of bonds involved in learning 'greatest common divisor' should also be left out. In reducing fractions to lowest terms the pupil should divide by anything that he sees that he can divide by, favoring large divisors, and continue doing so until he gets the fraction in terms suitable for the purpose in hand. The reader probably never has had occasion to compute a greatest common divisor since he left school. If he has computed any, the chances are that he would have saved time by solving the problem in some other way!

The following problems are taken at random from those given by one of the best of the textbooks that make the attempt to apply the facts of Greatest Common Divisor and Least Common Multiple to problems.^[6] Most of these problems are fantastic. The others are trivial, or are better solved by trial and adaptation.

1. A certain school consists of 132 pupils in the high school, 154 in the grammar, and 198 in the primary grades. If each group is divided into sections of the same number containing as many pupils as possible, how many pupils will there be in each section?

2. A farmer has 240 bu. of wheat and 920 bu. of oats, which he desires to put into the least number of boxes of the same capacity, without mixing the two kinds of grain. Find how many bushels each box must hold.

3. Four bells toll at intervals of 3, 7, 12, and 14 seconds respectively, and begin to toll at the same instant. When will they next toll together?

4. A, B, C, and D start together, and travel the same way around an island which is 600 mi. in circuit. A goes 20 mi. per day, B 30, C 25, and D 40. How long must their journeying continue, in order that they may all come together again?

5. The periods of three planets which move uniformly in circular orbits round the sun, are respectively 200, 250, and 300 da. Supposing their positions relatively to each other and the sun to be given at any moment, determine how many da. must elapse before they again have exactly the same relative positions.

(6) *Rare and unimportant words*.—The bonds between rare or unimportant words and their meanings should not be formed for the mere sake of verbal variety in the problems of the textbook. A pupil should not be expected to solve a problem that he cannot read. He should not be expected in grades 2 and 3, or even in grade 4, to read words that he has rarely or never seen before. He should not be given elaborate drill in reading during the time devoted to the treatment of quantitative facts and relations.

All this is so obvious that it may seem needless to relate. It is not. With many textbooks it is now necessary to give definite drill in reading the words in the printed problems intended for grades 2, 3, and 4, or to replace them by oral statements, or to leave the pupils in confusion concerning what the problems are that they are to solve. Many good teachers make a regular reading-lesson out of

every page of problems before having them solved. There should be no such necessity.

To define *rare* and *unimportant* concretely, I will say that for pupils up to the middle of grade 3, such words as the following are rare and unimportant (though each of them occurs in the very first fifty pages of some well-known beginner's book in arithmetic).

absentees	department	lettuce-	respectively
account	deposited	plant	Robert
Adele	dictation	library	Roger
admitted	discharged	Lottie	Ruth
Agnes	discover	Lula	rye
agreed	discovery	margin	Samuel
Albany	dish-water	Martha	San
Allen	drug	Matthew	Francisco
allowed	due	Maud	seldom
alternate	Edgar	meadow	sheared
Andrew	Eddie	mentally	shingles
Arkansas	Edwin	mercury	skyrockets
arrived	election	mineral	sloop
assembly	electric	Missouri	solve
automobile	Ella	molasses	speckled
baking	Emily	Morton	sponges
powder	enrolled	movements	sprout
balance	entertainment	muslin	stack
barley	envelope	Nellie	Stephen
beggar	Esther	nieces	strap
Bertie	Ethel	Oakland	successfully
Bessie	exceeds	observing	suggested
bin	explanation	obtained	sunny
Boston	expression	offered	supply
bouquet	generally	office	Susan
bronze	gentlemen	onions	Susie's
buckwheat	Gilbert	opposite	syllable
Byron	Grace	original	talcum
camphor	grading	package	term
Carl	Graham	packet	test
Carrie	grammar	palm	thermometer
Cecil	Harold	Patrick	Thomas
Charlotte	hatchet	Paul	torpedoes

charity	Heralds	payments	trader
Chicago	hesitation	peep	transaction
cinnamon	Horace Mann	Peter	treasury
Clara	impossible	perch	tricycle
clothespins	income	phaeton	tube
collect	indicated	photograph	two-seated
comma	inmost	piano	united
committee	inserts	pigeons	usually
concert	installments	Pilgrims	vacant
confectioner	instantly	preserving	various
cranberries	insurance	proprietor	vase
crane	Iowa	purchased	velocipede
currants	Jack	Rachel	votes
dairyman	Jennie	Ralph	walnuts
Daniel	Johnny	rapidity	Walter
David	Joseph	rather	Washington
dealer	journey	readily	watched
debt	Julia	receipts	whistle
delivered	Katherine	register	woodland
Denver		remanded	worsted

(7) *Misleading facts and procedures.*—Bonds should not be formed between articles of commerce and grossly inaccurate prices therefor, between events and grossly improbable consequences, or causes or accompaniments thereof, nor between things, qualities, and events which have no important connections one with another in the real world. In general, things should not be put together in the pupil's mind that do not belong together.

If the reader doubts the need of this warning let him examine problems 1 to 5, all from reputable books that are in common use, or have been within a few years, and consider how addition, subtraction, and the habits belonging with each are confused by exercise 6.

1. If a duck flying $\frac{3}{5}$ as fast as a hawk flies 90 miles in an hour, how fast does the hawk fly?
2. At $\frac{5}{8}$ of a cent apiece how many eggs can I buy for \$60?
3. At \$.68 a pair how many pairs of overshoes can you buy for \$816?
4. At \$.13 a dozen how many dozen bananas can you buy for \$3.12?
5. How many pecks of beans can be put into a box that will hold just 21 bushels?
6. Write answers:

537 Beginning at the bottom say 11, 18, and 2 (writing it in its place)
 365 are 20. 5, 11, 14, and 6 (writing it) are 20, 5, 10. The number,
 ? omitted, is 62.

$$\begin{array}{r} 36 \\ \hline 1000 \end{array}$$

<i>a.</i>	581	<i>b.</i>	625	<i>c.</i>	752	<i>d.</i>	314	<i>e.</i>	?
	97		?		414		429		845
	364		90		130		?		223
	?		417		?		76		95
	<u>1758</u>		<u>2050</u>		<u>2460</u>		<u>1000</u>		<u>2367</u>

(8) *Trivialities and absurdities.*—Bonds should not be formed between insignificant or foolish questions and the labor of answering them, nor between the general arithmetical work of the school and such insignificant or foolish questions. The following are samples from recent textbooks of excellent standing:—

On one side of George's slate there are 32 words, and on the other side 26 words. If he erases 6 words from one side, and 8 from the other, how many words remain on his slate?

A certain school has 14 rooms, and an average of 40 children in a room. If every one in the school should make 500 straight marks on each side of his slate, how many would be made in all?

8 times the number of stripes in our flag is the number of years from 1800 until Roosevelt was elected President. In what year was he elected President?

From the Declaration of Independence to the World's Fair in Chicago was 9 times as many years as there are stripes in the flag. How many years was it?

(9) *Useless methods.*—Bonds should not be formed between a described situation and a method of treating the situation which would not be a useful one to follow in the case of the real situation. For example, "If I set 96 trees in rows, sixteen trees in a row, how many rows will I have?" forms the habit of treating by division a problem that in reality would be solved by counting the rows. So also "I wish to give 25 cents to each of a group of boys and find that it will require \$2.75. How many boys are in the group?" forms the habit of answering a question by division whose answer must already have been present to give the data of the problem.

(10) *Problems whose answers would, in real life, be already known.*—The custom of giving problems in textbooks which could not occur in reality because the answer has to be known to frame the problem is a natural result of the lazy author's tendency to work out a problem to fit a certain process and a certain answer. Such bogus problems are very, very common. In a random sampling of a

dozen pages of "General Review" problems in one of the most widely used of recent textbooks, I find that about 6 percent of the problems are of this sort. Among the problems extemporized by teachers these bogus problems are probably still more frequent. Such are:—

A clerk in an office addressed letters according to a given list. After she had addressed 2500, $\frac{4}{9}$ of the names on the list had not been used; how many names were in the entire list?

The Canadian power canal at Sault Ste. Marie furnished 20,000 horse power. The canal on the Michigan side furnished $2\frac{1}{2}$ times as much. How many horse power does the latter furnish?

It may be asserted that the ideal of giving as described problems only problems that might occur and demand the same sort of process for solution with a real situation, is too exacting. If a problem is comprehensible and serves to illustrate a principle or give useful drill, that is enough, teachers may say. For really scientific teaching it is not enough. Moreover, if problems are given merely as tests of knowledge of a principle or as means to make some fact or principle clear or emphatic, and are not expected to be of direct service in the quantitative work of life, it is better to let the fact be known. For example, "I am thinking of a number. Half of this number is twice six. What is the number?" is better than "A man left his wife a certain sum of money. Half of what he left her was twice as much as he left to his son, who receives \$6000. How much did he leave his wife?" The former is better because it makes no false pretenses.

(11) *Needless linguistic difficulties.*—It should be unnecessary to add that bonds should not be formed between the pupil's general attitude toward arithmetic and needless, useless difficulty in language or needless, useless, wrong reasoning. Our teaching is, however, still tainted by both of these unfortunate connections, which dispose the pupil to think of arithmetic as a mystery and folly.

Consider, for example, the profitless linguistic difficulty of problems 1-6, whose quantitative difficulties are simply those of:—

1. $5 + 8 + 3 + 7$
2. $64 \div 8$, and knowledge that 1 peck = 8 quarts
3. $12 \div 4$
4. $6 \div 2$
5. 3×2
6. 4×4

1. What amount should you obtain by putting together 5 cents, 8 cents, 3 cents, and 7 cents? Did you find this result by adding or multiplying?

2. How many times must you empty a peck measure to fill a basket holding 64 quarts of beans?

3. If a girl commits to memory 4 pages of history in one day, in how many days will she commit to memory 12 pages?

4. If Fred had 6 chickens how many times could he give away 2 chickens to his companions?

5. If a croquet-player drove a ball through 2 arches at each stroke, through how many arches will he drive it by 3 strokes?

6. If mamma cut the pie into 4 pieces and gave each person a piece, how many persons did she have for dinner if she used 4 whole pies for dessert?

Arithmetically this work belongs in the first or second years of learning. But children of grades 2 and 3, save a few, would be utterly at a loss to understand the language.

We are not yet free from the follies illustrated in the lessons of pages 96 to 99, which mystified our parents.



FIG. 5.

LESSON I

1. In this picture, how many girls are in the swing?
2. How many girls are pulling the swing?
3. If you count both girls together, how many are they?
One girl and *one* other girl are how many?
4. How many kittens do you see on the stump?
5. How many on the ground?
6. How many kittens are in the picture? One kitten and one other kitten are how many?
7. If you should ask me how many girls are in the swing, or how many kittens are on the stump, I could answer aloud, *One*; or I could write *One*; or thus, *I*.
8. If I write *One*, this is called the *word One*.
9. This, *I*, is named a **figure One**, because it means the same as the word *One*, and stands for *One*.
10. Write 1. What is this named? Why?
11. A figure 1 may stand for *one* girl, *one* kitten, or *one* anything.
12. When children first attend school, what do they begin to learn? *Ans.* Letters and words.
13. Could you read or write before you had learned either letters or words?
14. If we have all the *letters* together, they are named the Alphabet.
15. If we write or speak *words*, they are named Language.
16. You are commencing to study Arithmetic; and you can read and write in Arithmetic only as you learn the Alphabet and Language of Arithmetic. But little time will be required for this purpose.

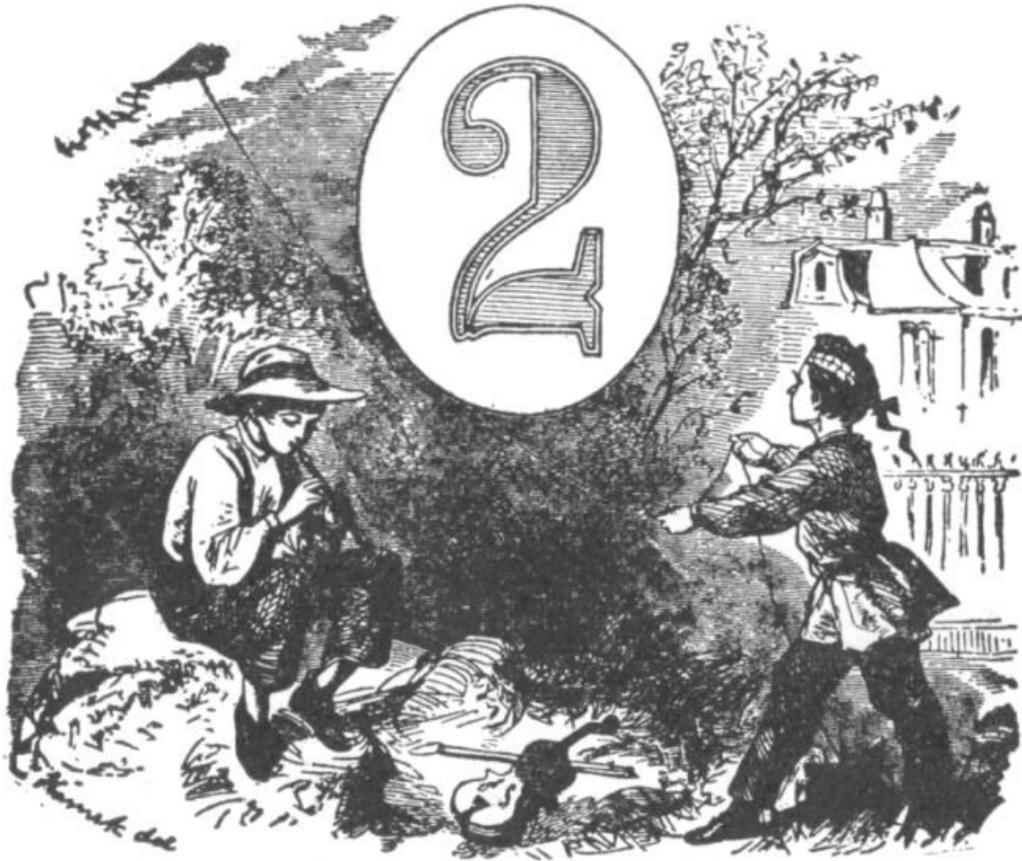


FIG. 6.

LESSON II

1. If we speak or write words, what do we name them, when taken together?
2. What are you commencing to study? *Ans.* Arithmetic.
3. What Language must you now learn?
4. What do we name this, **1**? Why?
5. This figure, **1**, is part of the Language of Arithmetic.
6. If I should write something to stand for **Two**—two girls, two kittens, or two things of any kind—what do you think we would name it?
 7. A **figure Two** is written thus: **2**. Make a *figure two*.
 8. Why do we name this a *figure two*?
 9. This figure two (**2**) is part of the Language of Arithmetic.
 10. In this picture one boy is sitting, playing a flageolet. What is the other boy doing? If the boy standing should sit down by the other, how many boys would be sitting together? One boy and one other boy are how

many boys?

11. You see a flageolet and a violin. They are musical instruments. One musical instrument and one other musical instrument are how many?

12. I will write thus: 1 1 2. We say that 1 boy and 1 other boy, counted together, are 2 boys; or are equal to 2 boys. We will now write something to show that the first 1 and the other 1 are to be counted together.



13. We name a line drawn thus,—, a *horizontal line*. Draw such a line. Name it.

14. A line drawn thus, |, we name a *vertical line*. Draw such a line. Name it.

15. Now I will put two such lines together; thus, +. What kind of a line do we name the first (—)? And what do we name the last? (|)? Are these lines long or short? Where do they cross each other?

16. Each of you write thus: —, |, +.

17. This, +, is named *Plus*. *Plus* means *more*; and + also means *more*.

18. I will write.

One and One More Equal Two.

19. Now I will write part of this in the Language of Arithmetic. I write the first *One* thus, 1; then the other *One* thus, 1. Afterward I write, for the word *More*, thus, +, placing the + between 1 and 1, so that the whole stands thus: 1 + 1. As I write, I say, *One and One more*.

20. Each of you write 1 + 1. Read what you have written.

21. This +, when written between the 1s, shows that they are to be put together, or counted together, so as to make 2.

22. Because + shows what is to be done, it is called a *Sign*. If we take its name, *Plus*, and the word *Sign*, and put both words together, we have *Sign Plus*, or *Plus Sign*. In speaking of this we may call it *Sign Plus*, or *Plus Sign*, or *Plus*.

23. 1, 2, +, are part of the Language of Arithmetic.

Write the following in the Language of Arithmetic:

24. One and one more.
25. One and two more.
26. Two and one more.

(12) *Ambiguities and falsities.*—Consider the ambiguities and false reasoning of these problems.

1. If you can earn 4 cents a day, how much can you earn in 6 weeks? (Are Sundays counted? Should a child who earns 4 cents some day expect to repeat the feat daily?)

2. How many lines must you make to draw ten triangles and five squares? (I can do this with 8 lines, though the answer the book requires is 50.)

3. A runner ran twice around an $\frac{1}{8}$ mile track in two minutes. What distance did he run in $\frac{2}{3}$ of a minute? (I do not know, but I do know that, save by chance, he did not run exactly $\frac{2}{3}$ of $\frac{1}{8}$ mile.)

4. John earned \$4.35 in a week, and Henry earned \$1.93. They put their money together and bought a gun. What did it cost? (Maybe \$5, maybe \$10. Did they pay for the whole of it? Did they use all their earnings, or less, or more?)

5. Richard has 12 nickels in his purse. How much more than 50 cents would you give him for them? (Would a wise child give 60 cents to a boy who wanted to swap 12 nickels therefor, or would he suspect a trick and hold on to his own coins?)

6. If a horse trots 10 miles in one hour how far will he travel in 9 hours?

7. If a girl can pick 3 quarts of berries in 1 hour how many quarts can she pick in 3 hours?

(These last two, with a teacher insisting on the 90 and 9, might well deprive a matter-of-fact boy of respect for arithmetic for weeks thereafter.)

The economics and physics of the next four problems speak for themselves.

8. I lost \$15 by selling a horse for \$85. What was the value of the horse?

9. If floating ice has 7 times as much of it under the surface of the water as above it, what part is above water? If an iceberg is 50 ft. above water, what is the entire height of the iceberg? How high above water would an iceberg 300 ft. high have to be?

10. A man's salary is \$1000 a year and his expenses \$625. How many years will elapse before he is worth \$10,000 if he is worth \$2500 at the present time?

11. Sound travels 1120 ft. a second. How long after a cannon is fired in New York will the report be heard in Philadelphia, a distance of 90 miles?

GUIDING PRINCIPLES

The reader may be wearied of these special details concerning bonds now neglected that should be formed and useless or harmful bonds formed for no valid reason. Any one of them by itself is perhaps a minor matter, but when we have cured all our faults in this respect and found all the possibilities for wiser selection

of bonds, we shall have enormously improved the teaching of arithmetic. The ideal is such choice of bonds (and, as will be shown later, such arrangement of them) as will most improve the functions in question at the least cost of time and effort. The guiding principles may be kept in mind in the form of seven simple but golden rules:—

1. Consider the situation the pupil faces.
 2. Consider the response you wish to connect with it.
 3. Form the bond; do not expect it to come by a miracle.
 4. Other things being equal, form no bond that will have to be broken.
 5. Other things being equal, do not form two or three bonds when one will serve.
 6. Other things being equal, form bonds in the way that they are required later to act.
 7. Favor, therefore, the situations which life itself will offer, and the responses which life itself will demand.
-

CHAPTER V

THE PSYCHOLOGY OF DRILL IN ARITHMETIC: THE STRENGTH OF BONDS

An inventory of the bonds to be formed in learning arithmetic should be accompanied by a statement of how strong each bond is to be made and kept year by year. Since, however, the inventory itself has been presented here only in samples, the detailed statement of desired strength for each bond cannot be made. Only certain general facts will be noted here.

THE NEED OF STRONGER ELEMENTARY BONDS

The constituent bonds involved in the fundamental operations with numbers need to be much stronger than they now are. Inaccuracy in these operations means weakness of the constituent bonds. Inaccuracy exists, and to a degree that deprives the subject of much of its possible disciplinary value, makes the pupil's achievements of slight value for use in business or industry, and prevents the pupil from verifying his work with new processes by some previously acquired process.

The inaccuracy that exists may be seen in the measurements made by the many investigators who have used arithmetical tasks as tests of fatigue, practice, individual differences and the like, and in the special studies of arithmetical achievements for their own sake made by Curtis and others.

Burgerstein ['91], using such examples as

$$\begin{array}{r}
 28704516938276546397 \\
 + 35869427359163827263 \\
 \hline
 \end{array}$$

and similar long numbers to be multiplied by 2 or by 3 or by 4 or by 5 or by 6, found 851 errors in 28,267 answer-figures, or 3 per hundred answer-figures, or $\frac{3}{5}$ of an error per example. The children were $9\frac{1}{2}$ to 15 years old. Laser ['94], using the same sort of addition and multiplication, found somewhat over 3 errors per hundred answer-figures in the case of boys and girls averaging $11\frac{1}{2}$ years, during the period of their most accurate work. Holmes ['95], using addition of the sort just described, found 346 errors in 23,713 answer-figures or about $1\frac{1}{2}$ per hundred. The children were from all grades from the third to the eighth. In Laser's work, 21, 19, 13, and 10 answer-figures were obtained per minute. Friedrich ['97] with similar examples, giving the very long time of 20 minutes for obtaining about 200 answer-figures, found from 1 to 2 per hundred wrong. King ['07] had children in grade 5 do sums, each consisting of 5 two-place numbers. In the most accurate work-period, they made 1 error per 20 columns. In multiplying a four-place by a four-place number they had less than one total answer right out of three. In New York City Courtis found ['11-'12] with his Test 7 that in 12 minutes the average achievement of fourth-grade children is 8.8 units attempted with 4.2 right. In grade 5 the facts are 10.9 attempts with 5.8 right; in grade 6, 12.5 attempts with 7.0 right; in grade 7, 15 attempts with 8.5 right; in grade 8, 15.7 attempts with 10.1 right. These results are near enough to those obtained from the country at large to serve as a text here.

The following were set as official standards, in an excellent school system, Courtis Series B being used:—

	GRADE.	SPEED ATTEMPTS.	PERCENT OF CORRECT ANSWERS.
Addition	8	12	80
	7	11	80
	6	10	70
	5	9	70
	4	8	70
Subtraction	8	12	90
	7	11	90
	6	10	90
	5	9	80
	4	7	80
Multiplication	8	11	80
	7	10	80
	6	9	80
	5	7	70
	4	6	60
Division	8	11	90
	7	10	90
	6	8	80
	5	6	70
	4	4	60

Kirby ['13, pp. 16 ff. and 55 ff.] found that, in adding columns like those printed below, children in grade 4 got on the average less than 80 percent of correct answers. Their average speed was about 2 columns per minute. In doing division of the sort printed below children of grades 3 *B* and 4 *A* got less than 95 percent of correct answers, the average speed being 4 divisions per minute. In both cases the slower computers were no more accurate than the faster ones. Practice improved the speed very rapidly, but the accuracy remained substantially unchanged. Brown ['11 and '12] found a similar low status of ability and notable improvement from a moderate amount of special practice.

3 5 6 2 3 8 9 7 4 9

7	9	6	5	5	6	4	5	8	2
3	4	7	8	7	3	7	9	3	7
8	8	4	8	2	6	8	2	9	8
2	2	4	7	6	9	8	5	6	2
6	9	5	7	8	5	2	3	2	4
9	6	4	2	7	2	9	4	4	5
3	3	7	9	9	9	2	8	9	7
6	8	9	6	4	7	7	9	2	4
8	4	6	9	9	2	6	9	8	9
—	—	—	—	—	—	—	—	—	—

- 20 = 5s
- 56 = 9s and r.
- 30 = 7s and r.
- 89 = 9s and r.
- 20 = 8s and r.
- 56 = 6s and r.
- 31 = 4s and r.
- 86 = 9s and r.

It is clear that numerical work as inaccurate as this has little or no commercial or industrial value. If clerks got only six answers out of ten right as in the Courtis tests, one would need to have at least four clerks make each computation and would even then have to check many of their discrepancies by the work of still other clerks, if he wanted his accounts to show less than one error per hundred accounting units of the Courtis size.

It is also clear that the "habits of ... absolute accuracy, and satisfaction in truth as a result" which arithmetic is supposed to further must be largely mythical in pupils who get right answers only from three to nine times out of ten!

EARLY MASTERY

The bonds in question clearly must be made far stronger than they now are. They should in fact be strong enough to abolish errors in computation, except for those due to temporary lapses. It is much better for a child to know half of the multiplication tables, and to know that he does not know the rest, than to half-know them all; and this holds good of all the elementary bonds required for computation. Any bond should be made to work perfectly, though slowly, very soon after its formation is begun. Speed can easily be added by proper practice.

The chief reasons why this is not done now seem to be the following: (1) Certain important bonds (like the additions with higher decades) are not given enough attention when they are first used. (2) The special training necessary when a bond is used in a different connection (as when the multiplications to 9×9 are used in examples like

$$\begin{array}{r} 729 \\ \underline{\quad 8} \end{array}$$

where the pupil has also to choose the right number to multiply, keep in mind what is carried, use it properly, and write the right figure in the right place, and carry a figure, or remember that he carries none) is neglected. (3) The pupil is not taught to check his work. (4) He is not made responsible for substantially accurate results. Furthermore, the requirement of (4) without the training of (1), (2), and (3) will involve either a fruitless failure on the part of many pupils, or an utterly unjust requirement of time. The common error of supposing that the task of computation with integers consists merely in learning the additions to $9 + 9$, the subtractions to $18 - 9$, the multiplications to 8×9 , and the divisions to $81 \div 9$, and in applying this knowledge in connection with the principles of decimal notation, has had a large share in permitting the gross inaccuracy of arithmetical work. The bonds involved in 'knowing the tables' do not make up one fourth of the bonds involved in real adding, subtracting, multiplying, and dividing (with integers alone).

It should be noted that if the training mentioned in (1) and (2) is well cared for, the checking of results as recommended in (3) becomes enormously more valuable than it is under present conditions, though even now it is one of our soundest practices. If a child knows the additions to higher decades so that he can add a seen one-place number to a thought-of two-place number in three seconds or less with a correct answer 199 times out of 200, there is only an infinitesimal chance that a ten-figure column twice added (once up, once down) a few minutes apart with identical answers will be wrong. Suppose that, in long multiplication, a pupil can multiply to 9×9 while keeping his place and keeping track of what he is 'carrying' and of where to write the figure he writes, and can add what he carries without losing track of what he is to add it to, where he is to write the unit figure, what he is to multiply next and by what, and what he will then have to carry, in each case to a surety of 99 percent of correct responses. Then two identical answers got by multiplying one three-place number by another a few minutes apart, and with reversal of the numbers, will not be wrong more than twice in his entire school career. Checks approach proofs when the constituent bonds are strong.

If, on the contrary, the fundamental bonds are so weak that they do not work accurately, checking becomes much less trustworthy and also very much more laborious. In fact, it is possible to show that below a certain point of strength of the fundamental bonds, the time required for checking is so great that part of it might better be spent in improving the fundamental bonds.

For example, suppose that a pupil has to find the sum of five numbers like \$2.49, \$5.25, \$6.50, \$7.89, and \$3.75. Counting each act of holding in mind the number to be carried and each writing of a column's result as equivalent in difficulty to one addition, such a sum equals nineteen single additions. On this basis and with certain additional estimates^[7] we can compute the practical consequences for a pupil's use of addition in life according to the mastery of it that he has gained in school.

I have so computed the amount of checking a pupil will have to do to reach two agreeing numbers (out of two, or three, or four, or five, or whatever the number before he gets two that are alike), according to his mastery of the elementary processes. The facts appear in Table 1.

It is obvious that a pupil whose mastery of the elements is that denoted by getting them right 96 times out of 100 will require so much time for checking that, even if he were never to use this ability for anything save a few thousand sums in addition, he would do well to improve this ability before he tried to do the sums. An ability of 199 out of 200, or 995 out of 1000, seems likely to save much more time than would be taken to acquire it, and a reasonable defense could be made for requiring 996 or 997 out of 1000.

A precision of from 995 to 997 out of 1000 being required, and ordinary sagacity being used in the teaching, speed will substantially take care of itself. Counting on the fingers or in words will not give that precision. Slow recourse to memory of serial addition tables will not give that precision. Nothing save sure memory of the facts operating under the conditions of actual examples will give it. And such memories will operate with sufficient speed.

TABLE 1

THE EFFECT OF MASTERY OF THE ELEMENTARY FACTS OF ADDITION UPON THE LABOR REQUIRED TO SECURE TWO AGREEING ANSWERS WHEN ADDING FIVE THREE-FIGURE NUMBERS

MASTERY OF THE ELEMENTARY ADDITIONS TIMES RIGHT IN 1000	APPROXIMATE NUMBER OF WRONG ANSWERS IN SUMS OF 5 THREE-PLACE NUMBERS PER 1000	APPROXIMATE NUMBER OF AGREEING ANSWERS, AFTER ONE CHECKING, PER 1000	APPROXIMATE NUMBER OF AGREEING ANSWERS, AFTER A CHECKING OF THE FIRST DISCREPANCIES	APPROXIMATE NUMBER OF CHECKINGS REQUIRED (OVER AND ABOVE THE FIRST GENERAL CHECKING OF THE 100 SUMS) TO SECURE TWO

				AGREEING RESULTS
960	700	90	216	4500
980	380	384	676	1200
990	190	656	906	470
995	95	819	975	210
996	76	854	984	165
997	54	895	992	115
998	38	925	996	80
999	19	962	999	40

There is one intelligent objection to the special practice necessary to establish arithmetical connections so fully as to give the accuracy which both utilitarian and disciplinary aims require. It may be said that the pupils in grades 3, 4, and 5 cannot appreciate the need and that consequently the work will be dull, barren, and alien, without close personal appropriation by the pupil's nature. It is true that no vehement life-purpose is directly involved by the problem of perfecting one's power to add 7 to 28 in grade 2, or by the problem of multiplying 253 by 8 accurately in grade 3 or by precise subtraction in long division in grade 4. It is also true, however, that the most humanly interesting of problems—one that the pupil attacks most whole-heartedly—will not be solved correctly unless the pupil has the necessary associative mechanisms in order; and the surer he is of them, the freer he is to think out the problem as such. Further, computation is not dull if the pupil can compute. He does not himself object to its barrenness of vital meaning, so long as the barrenness of failure is prevented. We must not forget that pupils like to learn. In teaching excessively dull individuals, who has not often observed the great interest which they display in anything that they are enabled to master? There is pathos in their joy in learning to recognize parts of speech, perform algebraic simplifications, or translate Latin sentences, and in other accomplishments equally meaningless to all their interests save the universal human interest in success and recognition. Still further, it is not very hard to show to pupils the imperative need of accuracy in scoring games, in the shop, in the store, and in the office. Finally, the argument that accurate work of this sort is alien to the pupil in these grades is still stronger against *inaccurate* work of the same sort. If we are to teach computation with two- and three- and four-place numbers at all, it should be taught as a reliable instrument, not as a combination of vague memories and faith. The author is ready to cut computation with numbers above 10 out of the curriculum of grades 1-6 as soon as more valuable educational instruments are offered in its place, but he is convinced that nothing in child-nature makes a large variety of inaccurate computing more interesting or educative or germane to felt needs, than a smaller variety of accurate computing!

THE STRENGTH OF BONDS FOR TEMPORARY SERVICE

The second general fact is that certain bonds are of service for only a limited time and so need to be formed only to a limited and slight degree of strength. The data of problems set to illustrate a principle or improve some habit of computation are, of course, the clearest cases. The pupil needs to remember that John bought 3 loaves of bread and that they were 5-cent loaves and that he gave 25 cents to the baker only long enough to use the data to decide what change John should receive. The connections between the total described situation and the answer obtained, supposing some considerable computation to intervene, is a bond that we let expire almost as soon as it is born.

It is sometimes assumed that the bond between a certain group of features which make a problem a 'Buy a things at b per thing, find total cost' problem or a 'Buy a things at b per thing, what change from c ' problem or a 'What gain on buying for a and selling for b ' problem or a 'How many things at a each can I buy for b cents' problem—it is assumed that the bond between these essential defining features and the operation or operations required for solution is as temporary as the bonds with the name of the buyer or the price of the thing. It is assumed that all problems are and should be solved by some pure act of reasoning without help or hindrance from bonds with the particular verbal structure and vocabulary of the problems. Whether or not they *should* be, they *are not*. Every time that a pupil solves a 'bought-sold' problem by subtraction he strengthens the tendency to respond to any problem whatsoever that contains the words 'bought for' and 'sold for' by subtraction; and he will by no means surely stop and survey every such problem in all its elements to make sure that no other feature makes inapplicable the tendency to subtract which the 'bought sold' evokes.

To prevent pupils from responding to the form of statement rather than the essential facts, we should then not teach them to forget the form of statement, but rather give them all the common forms of statement to which the response in question is an appropriate response, and only such. If a certain form of statement does in life always signify a certain arithmetical procedure, the bond between it and that procedure may properly be made very strong.

Another case of the formation of bonds to only a slight degree of strength concerns the use of so-called 'crutches' such as writing +, -, and × in copying problems like those below:—

Add	Subtract	Multiply
23	79	32
61	24	3
—	—	—

or altering the figures when 'borrowing' in subtraction, and the like. Since it is undesirable that the pupil should regard the 'crutch' response as essential to the total procedure, or become so used to having it that he will be disturbed by its absence later, it is supposed that the bond between the situation and the crutch should not be fully formed. There is a better way out of the difficulty, in case crutches are used at all. This is to associate the crutch with a special 'set,' and its non-use with the general set which is to be the permanent one. For example, children may be taught from the start never to write the crutch sign or crutch figure unless the work is accompanied by "Write ... to help you to...."

<p>Write - to help you to remember that you must subtract in this row.</p>	<p>Find the differences:—</p> <table style="width: 100%; text-align: center;"> <tr> <td>39</td> <td>67</td> <td>78</td> <td>56</td> <td>45</td> </tr> <tr> <td><u>23</u></td> <td><u>44</u></td> <td><u>36</u></td> <td><u>26</u></td> <td><u>24</u></td> </tr> </table>	39	67	78	56	45	<u>23</u>	<u>44</u>	<u>36</u>	<u>26</u>	<u>24</u>
39	67	78	56	45							
<u>23</u>	<u>44</u>	<u>36</u>	<u>26</u>	<u>24</u>							
<p>Remember that you must subtract in this row.</p>	<p>Find the differences:—</p> <table style="width: 100%; text-align: center;"> <tr> <td>85</td> <td>27</td> <td>96</td> <td>38</td> <td>78</td> </tr> <tr> <td><u>63</u></td> <td><u>14</u></td> <td><u>51</u></td> <td><u>45</u></td> <td><u>32</u></td> </tr> </table>	85	27	96	38	78	<u>63</u>	<u>14</u>	<u>51</u>	<u>45</u>	<u>32</u>
85	27	96	38	78							
<u>63</u>	<u>14</u>	<u>51</u>	<u>45</u>	<u>32</u>							

The bond evoking the use of the crutch may then be formed thoroughly enough so that there is no hesitation, insecurity, or error, without interfering to any harmful extent with the more general bond from the situation to work without the crutch.

THE STRENGTH OF BONDS WITH TECHNICAL FACTS AND TERMS

Another instructive case concerns the bonds between certain words and their meanings, and between certain situations of commerce, industry, or agriculture and useful facts about these situations. Illustrations of the former are the bonds between *cube root*, *hectare*, *brokerage*, *commission*, *indorsement*, *vertex*, *adjacent*, *nonagon*, *sector*, *draft*, *bill of exchange*, and their meanings. Illustrations of the latter are the bonds from "Money being lent 'with interest' at no specified rate, what rate is charged?" to "The legal rate of the state," from "\$X per M as a rate for lumber" to "Means \$X per thousand board feet, a board foot being 1 ft. by 1 ft. by 1 in."

It is argued by many that such bonds are valuable for a short time; namely, while arithmetical procedures in connection with which they serve are learned, but that their value is only to serve as a means for learning these procedures and that thereafter they may be forgotten. "They are formed only as accessory means to certain more purely arithmetical knowledge or discipline; after this is acquired they may be forgotten. Everybody does in fact forget them, relearning them later if life requires." So runs the argument.

In some cases learning such words and facts only to use them in solving a certain sort of problems and then forget them may be profitable. The practice is, however, exceedingly risky. It is true that everybody does in fact forget many such meanings and facts, but this commonly means either that they should not have been learned at all at the time that they were learned, or that they should have been learned more permanently, or that details should have been learned with the expectation that they themselves would be forgotten but that a general fact or attitude would remain. For example, duodecagon should not be learned at all in the elementary school; indorsement should either not be learned at all there, or be learned for permanence of a year or more; the details of the metric system should be so taught as to leave for several years at least knowledge of the facts that there is a system so named that is important, whose tables go by tens, hundreds, or thousands, and a tendency (not necessarily strong) to connect

meter, kilogram, and liter with measurement by the metric system and with approximate estimates of their several magnitudes.

If an arithmetical procedure seems to require accessory bonds which are to be forgotten, once the procedure is mastered, we should be suspicious of the value of the procedure itself. If pupils forget what compound interest is, we may be sure that they will usually also have forgotten how to compute it. Surely there is waste if they have learned what it is only to learn how to compute it only to forget how to compute it!

THE STRENGTH OF BONDS CONCERNING THE REASONS FOR ARITHMETICAL PROCESSES

The next case of the formation of bonds to slight strength is the problematic one of forming the bonds involved in understanding the reasons for certain processes only to forget them after the process has become a habit. Should a pupil, that is, learn why he inverts and multiplies, only to forget it as soon as he can be trusted to divide by a fraction? Should he learn why he puts the units figure of each partial product in multiplication under the figure that he multiplies by, only to forget the reason as soon as he has command of the process? Should he learn why he gets the number of square inches in a rectangle by multiplying the length by the width, both being expressed in linear inches, and forget why as soon as he is competent to make computations of the areas of rectangles?

On general psychological grounds we should be suspicious of forming bonds only to let them die of starvation later, and tend to expect that elaborate explanations learned only to be forgotten either should not be learned at all, or should be learned at such a time and in such a way that they would not be forgotten. Especially we should expect that the general principles of arithmetic, the whys and wherefores of its fundamental ways of manipulating numbers, ought to be the last bonds of all to be forgotten. Details of *how* you arranged numbers to multiply might vanish, but the general reasons for the placing would be expected to persist and enable one to invent the detailed manipulations that had been forgotten.

This suspicion is, I think, justified by facts. The doctrine that the customary deductive explanations of why we invert and multiply, or place the partial products as we do before adding, may be allowed to be forgotten once the actual habits are in working order, has a suspicious source. It arose to meet the criticism that so much time and effort were required to keep these deductive explanations in memory. The fact was that the pupil learned to compute correctly *irrespective of* the deductive explanations. They were only an added burden. His inductive learning that the procedure gave the right answer really taught him. So he wisely shuffled off the extra burden of facts about the consequences of the nature of a fraction or the place values of our decimal notation. The bonds weakened because they were not used. They were not used because they were not useful in the shape and at the time that they were formed, or because the pupil was unable to understand the explanations so as to form them at all.

The criticism was valid and should have been met in part by replacing the deductive explanations by inductive verifications, and in part by using the deductive reasoning as a check after the process itself is mastered. The very same discussions of place-value which are futile as proof that you must do a certain thing before you have done it, often become instructive as an explanation of why the thing that you have learned to do and are familiar with and have verified by other tests works as well as it does. The general deductive theory of arithmetic should not be learned only to be forgotten. Much of it should, by most pupils, not be learned at all. What is learned should be learned much later than now, as a synthesis and rationale of habits, not as their creator. What is learned of such deductive theory should rank among the most rather than least permanent of a pupil's stock of arithmetical knowledge and power. There are bonds which are formed only to be lost, and bonds formed only to be lost *in their first form*, being used in a new organization as material for bonds of a higher order; but the bonds involved in deductive explanations of why certain processes are right are not such: they are not to be formed just to be forgotten, nor as mere propædeutics to routine manipulations.

PROPÆDEUTIC BONDS

The formation of bonds to a limited strength because they are to be lost in their first form, being worked over in different ways in other bonds to which they are propædeutic or contributing is the most important case of low strength, or rather low permanence, in bonds.

The bond between four 5s in a column to be added and the response of thinking '10, 15, 20' is worth forming, but it is displaced later by the multiplication bond or direct connection of 'four 5s to be added' with '20.' Counting by 2s from 2, 3s from 3, 4s from 4, 5s from 5, etc., forms serial bonds which as series might well be left to disappear. Their separate steps are kept as permanent bonds for use in column addition, but their serial nature is changed from 2 (and 2) 4, (and 2) 6, (and 2) 8, etc., to two 2s = 4, three 2s = 6, four 2s = 8, etc.; after playing their part in producing the bonds whereby any multiple of 2 by 2 to 9, can be got, the original serial bonds are, as series, needed no longer. The verbal response of saying 'and' in adding, after helping to establish the bonds whereby the general set of the mind toward adding coöperates with the numbers seen or thought of to produce their sum, should disappear; or remain so slurred in inner speech as to offer no bar to speed.

The rule for such bonds is, of course, to form them strongly enough so that they work quickly and accurately for the time being and facilitate the bonds that are to replace them, but not to overlearn them. There is a difference between learning something to be held for a short time, and the same amount of energy spent in learning for long retention. The former sort of learning is, of course, appropriate with many of these propædeutic bonds.

The bonds mentioned as illustrations are not *purely* propædeutic, nor formed *only* to be transmuted into something else. Even the saying of 'and' in addition has some genuine, intrinsic value in distinguishing the process of addition, and may perhaps be usefully reviewed for a brief space during the first steps in adding common fractions. Some such propædeutic bonds may be worth while apart from their value in preparing for other bonds. Consider, for example, exercises like those shown below which are propædeutic to long division, giving the pupil some basis in experience for his selection of the quotient figures. These multiplications are intrinsically worth doing, especially the 12s and 25s. Whatever the pupil remembers of them will be to his advantage.

1. Count by 11s to 132, beginning 11, 22, 33.
2. Count by 12s to 144, beginning 12, 24, 36.
3. Count by 25s to 300, beginning 25, 50, 75.
4. State the missing numbers:—

A.	B.	C.	D.
3 11s =	5 11s =	8 ft. = in.	2 dozen =
4 12s =	3 12s =	10 ft. = in.	4 dozen =
5 12s =	6 12s =	7 ft. = in.	10 dozen =
6 11s =	12 11s =	4 ft. = in.	5 dozen =
9 11s =	2 12s =	6 ft. = in.	7 dozen =
7 12s =	9 12s =	9 ft. = in.	12 dozen =
8 12s =	7 11s =	11 ft. = in.	9 dozen =
11 11s =	12 12s =	5 ft. = in.	6 dozen =

5. Count by 25s to \$2.50, saying, "25 cents, 50 cents, 75 cents, one dollar," and so on.
6. Count by 15s to \$1.50.
7. Find the products. Do not use pencil. Think what they are.

A.	B.	C.	D.	E.
2×25	3×15	2×12	4×11	6×25
3×25	10×15	2×15	4×15	6×15
5×25	4×15	2×25	4×12	6×12
10×25	2×15	2×11	4×25	6×11
4×25	7×15	3×25	5×11	7×12
6×25	9×15	3×15	5×12	7×15
8×25	5×15	3×11	5×15	7×25
7×25	8×15	3×12	5×25	7×11
9×25	6×15	8×12	9×12	8×25

State the missing numbers:—

- | | | |
|---------------------|---------------------|---------------------|
| A. $36 = \dots 12s$ | B. $44 = \dots 11s$ | C. $50 = \dots 25s$ |
| $60 = \dots 12s$ | $88 = \dots 11s$ | $125 = \dots 25s$ |

24 = 12s	77 = 11s	75 = 25s
48 = 12s	55 = 11s	200 = 25s
144 = 12s	99 = 11s	250 = 25s
108 = 12s	110 = 11s	175 = 25s
72 = 12s	33 = 11s	225 = 25s
96 = 12s	66 = 11s	150 = 25s
84 = 12s	22 = 11s	100 = 25s

Find the quotients and remainders. If you need to use paper and pencil to find them, you may. But find as many as you can without pencil and paper. Do Row A first. Then do Row B. Then Row C, etc.

Row A.	11 $\overline{)45}$	12 $\overline{)45}$	25 $\overline{)45}$	15 $\overline{)45}$	21 $\overline{)45}$	22 $\overline{)45}$
Row B.	25 $\overline{)55}$	11 $\overline{)55}$	12 $\overline{)55}$	15 $\overline{)55}$	22 $\overline{)55}$	30 $\overline{)55}$
Row C.	12 $\overline{)60}$	25 $\overline{)60}$	15 $\overline{)60}$	11 $\overline{)60}$	30 $\overline{)60}$	21 $\overline{)60}$
Row D.	12 $\overline{)75}$	11 $\overline{)75}$	15 $\overline{)75}$	25 $\overline{)75}$	30 $\overline{)75}$	35 $\overline{)75}$
Row E.	11 $\overline{)100}$	12 $\overline{)100}$	25 $\overline{)100}$	15 $\overline{)100}$	30 $\overline{)100}$	22 $\overline{)100}$
Row F.	11 $\overline{)96}$	12 $\overline{)96}$	25 $\overline{)96}$	15 $\overline{)96}$	30 $\overline{)96}$	22 $\overline{)96}$
Row G.	25 $\overline{)105}$	11 $\overline{)105}$	15 $\overline{)105}$	12 $\overline{)105}$	22 $\overline{)105}$	35 $\overline{)105}$
Row H.	12 $\overline{)64}$	15 $\overline{)64}$	25 $\overline{)64}$	11 $\overline{)64}$	22 $\overline{)64}$	21 $\overline{)64}$
Row I.	11 $\overline{)80}$	12 $\overline{)80}$	15 $\overline{)80}$	25 $\overline{)80}$	35 $\overline{)80}$	21 $\overline{)80}$
Row J.	25 $\overline{)200}$	30 $\overline{)200}$	75 $\overline{)200}$	63 $\overline{)200}$	65 $\overline{)200}$	66 $\overline{)200}$

Do this section again. Do all the first column first. Then do the second column, then the third, and so on.

Consider, from the same point of view, exercises like $(3 \times 4) + 2$, $(7 \times 6) + 5$, $(9 \times 4) + 6$, given as a preparation for written multiplication. The work of

48	68	47
<u> 3</u>	<u> 7</u>	<u> 9</u>

and the like is facilitated if the pupil has easy control of the process of getting a product, and keeping it in mind while he adds a one-place number to it. The practice with $(3 \times 4) + 2$ and the like is also good practice intrinsically. So some teachers provide systematic preparatory drills of this type just before or along with the beginning of short multiplication.

In some cases the bonds are purely propædeutic or are formed *only* for later reconstruction. They then differ little from 'crutches.' The typical crutch forms a habit which has actually to be broken, whereas the purely propædeutic bond forms a habit which is left to rust out from disuse.

For example, as an introduction to long division, a pupil may be given exercises using one-figure divisors in the long form, as:—

$\begin{array}{r} 773 \\ 7 \overline{)5416} \\ \underline{49} \\ 51 \\ \underline{49} \\ 26 \\ \underline{21} \\ 5 \end{array}$	and 5 remainder
---	-----------------

The important recommendation concerning these purely propædeutic bonds, and bonds formed only for later reconstruction, is to be very critical of them, and not indulge in them when, by the exercise of enough ingenuity, some bond worthy of a permanent place in the individual's equipment can be devised which will do the work as well. Arithmetical teaching has done very well in this respect, tending to err by leaving out really valuable preparatory drills rather than by inserting uneconomical ones. It is in the teaching of reading that we find the formation of propædeutic bonds of dubious value (with letters, phonograms, diacritical marks, and the like) often carried to demonstrably wasteful extremes.

CHAPTER VI

THE PSYCHOLOGY OF DRILL IN ARITHMETIC: THE AMOUNT OF PRACTICE AND THE ORGANIZATION OF ABILITIES

THE AMOUNT OF PRACTICE

It will be instructive if the reader will perform the following experiment as an introduction to the discussion of this chapter, before reading any of the discussion.

Suppose that a pupil does all the work, oral and written, computation and problem-solving, presented for grades 1 to 6 inclusive (that is, in the first two books of a three-book series) in the average textbook now used in the elementary school. How many times will he have exercised each of the various bonds involved in the four operations with integers shown below? That is, how many times will he have thought, "1 and 1 are 2," "1 and 2 are 3," etc.? Every case of the action of each bond is to be counted.

THE FUNDAMENTAL BONDS

1 + 1		2 - 1	1 × 1	2 ÷ 1
1 + 2		2 - 2	2 × 1	2 ÷ 2
1 + 3			3 × 1	
1 + 4			4 × 1	
1 + 5		3 - 1	5 × 1	3 ÷ 1
1 + 6		3 - 2	6 × 1	3 ÷ 2
1 + 7		3 - 3	7 × 1	3 ÷ 3
1 + 8			8 × 1	
1 + 9			9 × 1	
		4 - 1		4 ÷ 1
		4 - 2		4 ÷ 2
11 (or 21 or 31, etc.) + 1		4 - 3	1 × 2	4 ÷ 3
11	"	4 - 4	2 × 2	4 ÷ 4
11	"		3 × 2	
11	"		4 × 2	
11	"	5 - 1	5 × 2	5 ÷ 1
11	"	5 - 2	6 × 2	5 ÷ 2
11	"	5 - 3	7 × 2	5 ÷ 3
11	"	5 - 4	8 × 2	5 ÷ 4
11	"	5 - 5	9 × 2	5 ÷ 5
		6 - 1	1 × 3	6 ÷ 1
2 + 1		6 - 2	2 × 3	6 ÷ 2
2 + 2		6 - 3	3 × 3	6 ÷ 3
2 + 3		6 - 4	4 × 3	6 ÷ 4
2 + 4		6 - 5	5 × 3	6 ÷ 5
2 + 5		6 - 6	6 × 3	6 ÷ 6
2 + 6			7 × 3	
2 + 7			8 × 3	
2 + 8		7 - 1	9 × 3	7 ÷ 1
2 + 9		7 - 2		7 ÷ 2
		7 - 3		7 ÷ 3
		7 - 4	1 × 4	7 ÷ 4
12 (or 22 or 32, etc.) + 1		7 - 5	2 × 4	7 ÷ 5
12	"	7 - 6	and so on	7 ÷ 6
		7 - 7	to 9 × 9	7 ÷ 7
and so on to		and so on		and so on to
9 + 9		to 18 - 9		82 ÷ 9 83 ÷ 9, etc.
19 (or 29 or 39, etc.) + 9				

If estimating for the entire series is too long a task, it will be sufficient to use eight or ten from each, say:—

3 + 2	13, 23, etc. + 2	7 + 2	17, 27, etc. + 2
" 3	" 3	" 3	" 3
" 4	" 4	" 4	" 4
" 5	" 5	" 5	" 5
" 6	" 6	" 6	" 6
" 7	" 7	" 7	" 7
" 8	" 8	" 8	" 8
" 9	" 9	" 9	" 9
3 - 3	7 - 7	9 × 7	63 ÷ 9
4 "	8 "	7 × 9	64 "

5 "	9 "	8×6	65 "
6 "	10 "	6×8	66 "
7 "	11 "		67 "
8 "	12 "		68 "
9 "	13 "		69 "
10 "	14 "		70 "
11 "	15 "		71 "
12 "	16 "		

TABLE 2

ESTIMATES OF THE AMOUNT OF PRACTICE PROVIDED IN BOOKS I AND II OF THE AVERAGE THREE-BOOK TEXT IN ARITHMETIC; BY 50 EXPERIENCED TEACHERS

ARITHMETICAL FACT	LOWEST ESTIMATE	MEDIAN ESTIMATE	HIGHEST ESTIMATE	RANGE REQUIRED TO INCLUDE HALF OF THE ESTIMATES
3 or 13 or 23, etc. + 2	25	1500	1,000,000	800-5000
" " 3	24	1450	80,000	475-5000
" " 4	23	1150	50,000	750-5000
" " 5	22	1400	44,000	700-5000
" " 6	21	1350	41,000	700-4500
" " 7	21	1500	37,000	600-4000
" " 8	20	1400	33,000	550-4100
" " 9	20	1150	28,000	650-4500
7 or 17 or 27, etc. + 2	20	1250	2,000,000	600-5000
" " 3	19	1100	1,000,000	650-4900
" " 4	18	1000	80,000	650-4900
" " 5	17	1300	80,000	650-4400
" " 6	16	1100	29,000	650-4500
" " 7	15	1100	25,000	500-4500
" " 8	13	1100	21,000	650-3800
" " 9	10	1275	17,000	500-4000
3 - 3	25	1000	100,000	500-4000
4 - 3	20	1050	500,000	525-3000
5 - 3	20	1100	2,500,000	650-4200
6 - 3	10	1050	21,000	650-3250
7 - 3	22	1100	15,000	550-3050
8 - 3	21	1075	15,000	650-3000
9 - 3	21	1000	15,000	700-2600
10 - 3	20	1000	20,000	600-2500
11 - 3	20	1000	15,000	465-2550
12 - 3	18	1000	15,000	650-2100
7 - 7	10	1000	18,000	425-3000
8 - 7	15	1000	18,000	413-3100
9 - 7	15	950	18,000	550-3000
10 - 7	15	950	18,000	600-3950
11 - 7	10	900	18,000	550-3000

12 - 7	10	925	18,000	525-3100
13 - 7	10	900	18,000	500-2600
14 - 7	10	900	18,000	500-3100
15 - 7	10	925	18,000	500-3000
16 - 7	10	875	18,000	500-2500
9 × 7	10	700	20,000	500-2000
7 × 9	10	700	20,000	500-1750
8 × 6	10	750	20,000	500-2500
6 × 8	9	700	20,000	500-2500
63 ÷ 9	9	500	4,500	300-2500
64 ÷ 9	9	200	4,000	100- 700
65 ÷ 9	8	200	4,000	100- 600
66 ÷ 9	7	200	4,000	100- 550
67 ÷ 9	7	200	4,000	75- 450
68 ÷ 9	6	200	4,000	87- 575
69 ÷ 9	6	200	4,000	87- 450
70 ÷ 9	5	200	4,000	75- 575
71 ÷ 9	5	200	4,000	75- 700
XX	40	550	1,000,000	300-2000
XO	20	500	11,500	150-2000
XXX	15	450	12,000	100-1000
XXO	25	400	15,000	150-1000
XOO	15	400	5,000	100-1000
XOX	10	400	10,000	100- 975

Having made his estimates the reader should compare them first with similar estimates made by experienced teachers (shown on page 124 f.), and then with the results of actual counts for representative textbooks in arithmetic (shown on pages 126 to 132).

It will be observed in Table 2 that even experienced teachers vary enormously in their estimates of the amount of practice given by an average textbook in arithmetic, and that most of them are in serious error by overestimating the amount of practice. In general it is the fact that we use textbooks in arithmetic with very vague and erroneous ideas of what is in them, and think they give much more practice than they do.

The authors of the textbooks as a rule also probably had only very vague and erroneous ideas of what was in them. If they had known, they would almost certainly have revised their books. Surely no author would intentionally provide nearly four times as much practice on $2 + 2$ as on $8 + 8$, or eight times as much practice on 2×2 as on 9×8 , or eleven times as much practice on $2 - 2$ as on $17 - 8$, or over forty times as much practice on $2 \div 2$ as on $75 \div 8$ and $75 \div 9$, both together. Surely no author would have provided intentionally only twenty to thirty occurrences each of $16 - 7$, $16 - 8$, $16 - 9$, $17 - 8$, $17 - 9$, and $18 - 9$ for the entire course through grade 6; or have left the practice on $60 \div 7$, $60 \div 8$, $60 \div 9$, $61 \div 7$, $61 \div 8$, $61 \div 9$, and the like to occur only about once a year!

TABLE 3

AMOUNT OF PRACTICE: ADDITION BONDS IN A RECENT TEXTBOOK (A) OF EXCELLENT REPUTE. BOOKS I AND II, ALL SAVE FOUR SECTIONS OF SUPPLEMENTARY MATERIAL, TO BE USED AT THE TEACHER'S DISCRETION

The Table reads: $2 + 2$ was used 226 times, $12 + 2$ was used 74 times, $22 + 2$, $32 + 2$, $42 + 2$, and so on were used 50 times.

	2	3	4	5	6	7	8	9	Tot.
2	226	154	162	150	97	87	66	45	

12	74	53	76	46	51	37	36	33
22, etc.	50	60	68	63	42	50	38	26
3	216	141	127	89	82	54	58	40
13	43	43	60	70	52	30	22	18
23, etc.	15	30	51	50	42	32	29	30
7	85	90	103	103	84	81	61	47
17	35	25	42	32	35	21	29	16
27, etc.	30	23	32	29	24	23	25	28
8	185	112	146	99	75	71	73	61
18	28	35	52	46	28	29	24	14
28, etc.	53	36	34	38	23	36	27	27
9	104	81	112	96	63	74	58	57
19	13	11	31	38	25	14	22	11
29, etc.	19	17	27	20	32	32	19	18
2, 12, 22, etc.	350	277	306	260	190	174	140	104
3, 13, 23, etc.	274	214	230	209	176	116	109	88
7, 17, 27, etc.	148	138	187	164	141	125	115	91
8, 18, 28, etc.	266	183	232	185	126	136	124	102
9, 19, 29, etc.	136	109	170	154	120	120	99	86
Totals	1164	921	1125	972	753	671	687	471

TABLE 4

AMOUNT OF PRACTICE: SUBTRACTION BONDS IN A RECENT TEXTBOOK (A) OF EXCELLENT REPUTE. BOOKS I AND II, ALL SAVE FOUR SECTIONS OF SUPPLEMENTARY MATERIAL, TO BE USED AT THE TEACHER'S DISCRETION

MINUENDS	SUBTRAHENDS							
	1	2	3	4	5	6	7	8
1	372							

2	214	311							
3	136	149	189						
4	146	142	103	205					
5	171	91	92	164	136				
6	80	59	69	71	81	192			
7	106	57	55	67	59	156	80		
8	73	50	50	75	50	62	48	152	
9	71	75	54	74	48	55	55	124	
10	261	84	63	100	193	83	57	124	
11		48	31	50	36	41	32	46	
12			48	77	57	51	35	80	
13				35	22	40	29	35	
14					25	37	36	49	
15						33	19	48	
16							16	36	
17								27	
18									
Total excluding 1 – 1, 2 – 2, etc.	1258	755	565	713	571	558	327	569	

TABLE 5

FREQUENCIES OF SUBTRACTIONS NOT INCLUDED IN TABLE 4

These are cases where the pupil would, by reason of his stage of advancement, probably operate 35 – 30, 46 – 46, etc., as one bond.

MINUENDS	SUBTRAHENDS									
	1	2	3	4	5	6	7	8	9	10
	11 21 etc.	12 22 etc.	13 23 etc.	14 24 etc.	15 25 etc.	16 26 etc.	17 27 etc.	18 28 etc.	19 29 etc.	20 30 etc.
10, 20, 30, 40, etc.	11	29	16	52	32	51	7	30	22	60
11, 21, 31, 41, etc.	42	14	22	32	12	26	19	52	17	10
12, 22, 32, 42, etc.	47	97	5	13	9	21	11	24	19	17
13, 23, 33, 43, etc.	7	40	7	14	15	13	19	19	22	3
14, 24, 34, 44, etc.	8	28	14	58	13	16	14	26	19	7
15, 25, 35, 45, etc.	21	28	29	54	51	15	21	12	24	8
16, 26, 36, 46, etc.	5	18	12	27	35	69	13	17	19	2
17, 27, 37, 47, etc.	5	9	12	40	32	54	24	12	12	1
18, 28, 38, 48, etc.	2	16	10	23	22	36	18	47	16	0
19, 29, 39, etc.	5	7	7	10	13	28	14	23	16	0
Totals	153	286	134	323	234	329	160	262	186	108

TABLE 6

AMOUNT OF PRACTICE: MULTIPLICATION BONDS IN ANOTHER RECENT TEXTBOOK (B) OF EXCELLENT REPUTE. BOOKS I AND II

MULTIPLIERS	MULTIPLICANDS							
	0	1	2	3	4	5	6	7
1	299	534	472	271	310	293	261	178
2	350	644	668	480	458	377	332	238
3	280	487	509	388	318	302	247	199
4	186	375	398	242	203	265	197	163
5	268	359	393	234	263	243	217	192
6	180	284	265	199	196	191	168	169
7	135	283	277	176	187	158	155	121
8	137	272	292	175	192	164	158	157
9	71	173	140	122	97	102	101	100
Totals	1906	3411	3414	2287	2224	2095	1836	1517

TABLE 7

AMOUNT OF PRACTICE: DIVISIONS WITHOUT REMAINDER IN TEXTBOOK B, PARTS I AND II

DIVIDENDS	DIVISORS							
	2	3	4	5	6	7	8	9
Integral multiples of 2 to 9 in sequence; <i>i.e.</i> , 4 ÷ 2 occurred 397 times, 6 ÷ 2 occurred 256 times, 6 ÷ 3, 224 times, 9 ÷ 3, 124 times.	397	224	250	130	93	44	98	23
	256	124	152	79	28	43	61	25
	318	123	130	65	50	19	39	19
	258	98	86	105	25	24	34	20
	198	49	76	27	22	30	33	16
	77	54	36	31	28	27	16	9
	180	91	50	38	17	13	22	16
	69	46	37	24	12	17	16	15
Totals	1753	809	817	499	275	217	319	142

TABLE 8

DIVISION BONDS, WITH AND WITHOUT REMAINDERS. BOOK B

All work through grade 6, except estimates of quotient figures in long division.

Dividend	2		3			4				5		
Divisor	1	2	1	2	3	1	2	3	4	1	2	3
Number of Occurrences	41	386	27	189	240	26	397	66	185	23	136	43
Dividend	6						7					

Divisor	1	2	3	4	5	6	1	2	3	4	5	6
Number of Occurrences	21	256	224	68	43	83	23	72	55	38	46	32
Dividend	8								9			
Divisor	1	2	3	4	5	6	7	8	1	2	3	4
Number of Occurrences	17	318	30	250	22	28	39	91	19	50	124	49
Dividend	10								11			
Divisor	2	3	4	5	6	7	8	9	2	3	4	5
Number of Occurrences	258	38	46	120	19	9	24	24	32	21	16	3
Dividend	12								13			
Divisor	2	3	4	5	6	7	8	9	2	3	4	5
Number of Occurrences	198	123	152	29	93	9	16	7	45	16	15	11
Dividend	14								15			
Divisor	2	3	4	5	6	7	8	9	2	3	4	5
Number of Occurrences	77	20	13	5	8	44	8	6	69	98	16	79
Dividend	16								17			
Divisor	2	3	4	5	6	7	8	9	2	3	4	5
Number of Occurrences	180	19	130	14	6	9	98	3	61	9	15	14
Dividend	18								19			
Divisor	2	3	4	5	6	7	8	9	2	3	4	5
Number of Occurrences	69	49	13	6	28	7	7	23	21	6	10	5
Dividend	20								21			
Divisor	3	4	5	6	7	8	9	3	4	5	6	7
Number of Occurrences	24	86	65	11	3	23	5	54	12	8	5	43
Dividend	22								23			
Divisor	3	4	5	6	7	8	9	3	4	5	6	7
Number of Occurrences	17	16	15	8	13	6	15	7	8	11	8	6
Dividend	24								25			
Divisor	3	4	5	6	7	8	9	3	4	5	6	7
Number of Occurrences	91	76	18	50	5	61	1	11	13	105	5	6
Dividend	26								27			
Divisor	3	4	5	6	7	8	9	3	4	5	6	7
Number of	5	6	3	3	4	6	3	46	8	10	4	2

Occurrences

Dividend	28							29				
Divisor	3	4	5	6	7	8	9	3	4	5	6	7
Number of Occurrences	4	36	8	3	19	3	7	6	8	0	5	11
Dividend	30							31				
Divisor	4	5	6	7	8	9	4	5	6	7	8	9
Number of Occurrences	21	27	25	6	7	13	4	3	1	1	4	2
Dividend	32							33				
Divisor	4	5	6	7	8	9	4	5	6	7	8	9
Number of Occurrences	50	11	3	6	39	5	8	7	7	2	6	1
Dividend	34							35				
Divisor	4	5	6	7	8	9	4	5	6	7	8	9
Number of Occurrences	8	3	5	2	1	1	10	31	5	24	5	3
Dividend	36							37				
Divisor	4	5	6	7	8	9	4	5	6	7	8	9
Number of Occurrences	37	16	22	2	6	19	12	8	7	5	3	9
Dividend	38							39				
Divisor	4	5	6	7	8	9	4	5	6	7	8	9
Number of Occurrences	7	8	7	1	1	5	4	3	7	4	3	1
Dividend	40							41				42
Divisor	5	6	7	8	9	5	6	7	8	9	5	6
Number of Occurrences	38	9	2	34	2	6	6	3	7	5	7	28
Dividend	43							44				45
Divisor	5	6	7	8	9	5	6	7	8	9	5	6
Number of Occurrences	7	5	10	3	2	7	6	4	5	0	24	6
Dividend	46							47				48
Divisor	5	6	7	8	9	5	6	7	8	9	5	6
Number of Occurrences	3	3	2	2	2	6	2	2	0	3	7	17
Dividend	49							50			51	
Divisor	5	6	7	8	9	6	7	8	9	6	7	8
Number of Occurrences	4	7	27	9	2	4	6	3	8	2	3	1

Dividend	53				54				55			
Divisor	6	7	8	9	6	7	8	9	6	7	8	9
Number of Occurrences	4	3	2	2	12	5	1	16	5	3	4	2
Dividend	57				58				59			
Divisor	6	7	8	9	6	7	8	9	6	7	8	9
Number of Occurrences	0	3	1	3	2	2	3	1	2	3	0	3
Dividend	62				63				64			65
Divisor	7	8	9	7	8	9	7	8	9	7	8	9
Number of Occurrences	4	6	1	17	5	9	5	22	0	1	10	1
Dividend	68				69				70			72
Divisor	7	8	9	7	8	9	8	9	8	9	8	9
Number of Occurrences	1	3	2	0	6	1	6	2	1	0	16	10
Dividend	76				77				78			79
Divisor	8	9	8	9	8	9	8	9	8	9	8	9
Number of Occurrences	3	2	3	0	4	1	0	2	4	15	2	4

Tables 3 to 8 show that even gifted authors make instruments for instruction in arithmetic which contain much less practice on certain elementary facts than teachers suppose; and which contain relatively much more practice on the more easily learned facts than on those which are harder to learn.

How much practice should be given in arithmetic? How should it be divided among the different bonds to be formed? Below a certain amount there is waste because, as has been shown in Chapter VI, the pupil will need more time to detect and correct his errors than would have been required to give him mastery. Above a certain amount there is waste because of unproductive overlearning. If 668 is just enough for 2×2 , 82 is not enough for 9×8 . If 82 is just enough for 9×8 , 668 is too much for 2×2 .

It is possible to find the answers to these questions for the pupil of median ability (or any stated ability) by suitable experiments. The amount of practice will, of course, vary according to the ability of the pupil. It will also vary according to the interest aroused in him and the satisfaction he feels in progress and mastery. It will also vary according to the amount of practice of other related bonds; $7 + 7 = 14$ and $60 \div 7 = 8$ and 4 remainder will help the formation of $7 + 8 = 15$ and $61 \div 7 = 8$ and 5 remainder. It will also, of course, vary with the general difficulty of the bond, $17 - 8 = 9$ being under ordinary conditions of teaching harder to form than $7 - 2 = 5$.

Until suitable experiments are at hand we may estimate for the fundamental bonds as follows, assuming that by the end of grade 6 a strength of 199 correct out of 200 is to be had, and that the teaching is by an intelligent person working in accord with psychological principles as to both ability and interest.

For one of the easier bonds, most facilitated by other bonds (such as $2 \times 5 = 10$, or $10 - 2 = 8$, or the double bond $7 = \text{two } 3\text{s and } 1 \text{ remainder}$) in the case of the median or average pupil, twelve practices in the week of first learning, supported by twenty-five practices during the two months following, and maintained by thirty practices well spread over the later periods should be enough. For the more gifted pupils lesser amounts down to six, twelve, and fifteen may suffice. For the less gifted pupils more may be required up to thirty, fifty, and a hundred. It is to be doubted, however, whether pupils requiring nearly two hundred repetitions of each of these easy bonds should be taught arithmetic beyond a few matters of practical necessity.

For bonds of ordinary difficulty, with average facilitation from other bonds (such as $11 - 3$, 4×7 , or $48 \div 8 = 6$) in the case of the median or average pupil, we may estimate twenty practices in the week of first learning, supported by thirty, and maintained by fifty practices well spread over the later periods. Gifted pupils may gain and keep mastery with twelve, fifteen, and twenty practices respectively. Pupils dull at arithmetic may need up to twenty, sixty, and two hundred. Here, again, it is to be doubted whether a pupil for whom arithmetical facts, well taught and made interesting, are so hard to acquire as this, should learn many of them.

For bonds of greater difficulty, less facilitated by other bonds (such as $17 - 9$, 8×7 , or $12\frac{1}{2}\%$ of $= \frac{1}{8}$ of), the practice may be from ten to a hundred percent more than the above.

UNDERLEARNING AND OVERLEARNING

If we accept the above provisional estimates as reasonable, we may consider the harm done by giving less and by giving more than these reasonable amounts. Giving less is indefensible. The pupil's time is wasted in excessive checking to find his errors. He is in danger of being practiced in error. His attention is diverted from the learning of new facts and processes by the necessity of thinking out these supposedly mastered facts. All new bonds are harder to learn than they should be because the bonds which should facilitate them are not strong enough to do so. Giving more does harm to some extent by using up time that could be spent better for other purposes, and (though not necessarily) by detracting from the pupil's interest in arithmetic. In certain cases, however, such excess practice and overlearning are actually desirable. Three cases are of special importance.

The first is the case of a bond operating under a changed mental set or adjustment. A pupil may know 7×8 adequately as a thing by itself, but need more practice to operate it in

where he has to remember that 3 is to be added to the 56 when he obtains it, and that only the 9 is to be written down, the 5 to be held in mind for later use. The practice required to operate the bond efficiently in this new set is desirable, even though it is excess from a narrower point of view, and causes the straightforward 'seven eights are fifty-six' to be overlearned. So also a pupil's work with 24, 34, 44, etc., + 9 may react to give what would be excess practice from the point of view of 4 + 9 alone; his work in estimating approximate quotient figures in long division may give excess practice on the division tables. There are many such cases. Even adding the 5 and 7 in $\frac{5}{12} + \frac{7}{12}$ is not quite the same task as adding 5 and 7 undisturbed by the fact that they are twelfths. We know far too little about the amount of practice needed to adapt arithmetical bonds to efficient operation in these more complicated conditions to estimate even approximately the allowances to be made. But some allowance, and often a rather large allowance, must be made.

The second is the case where the computation in general should be made very easy and sure for the pupil except for some one new element that is being learned. For example, in teaching the meaning and uses of 'Averages' and of uneven division, we may deliberately use 2, 3, and 4 as divisors rather than 7 and 9, so as to let all the pupil's energy be spent in learning the new facts, and so that the fraction in the quotient may be something easily understood, real, and significant. In teaching the addition of mixed numbers, we may use, in the early steps,

$11\frac{1}{2}$	$79\frac{1}{2}$
$13\frac{1}{2}$	$98\frac{1}{2}$
24	67
_____	_____

rather than

so as to save attention for the new process itself. In cancellation, we may give excess practice to divisions by 2, 3, 4, and 5 in order to make the transfer to the new habits of considering two numbers together from the point of view of their divisibility by some number. In introducing trade discount, we may give excess practice on '5% of' and '10% of' deliberately, so that the meaning of discount may not be obscured by difficulties in the computation itself. Excess practice on, and overlearning of, certain bonds is thus very often justifiable.

The third case concerns bonds whose importance for practical uses in life or as notable facilitators of other bonds is so great that they may profitably be brought to a greater strength than 199 correct out of 200 at a speed of 2 sec. or less, or be brought to that degree of strength very early. Examples of bonds of such special practical use are the subtractions from 10, $\frac{1}{2} + \frac{1}{2}$, $\frac{1}{2} + \frac{1}{4}$, $\frac{1}{2}$ of 60, $\frac{1}{4}$ of 60, and the fractional parts of 12 and of \$1.00. Examples of notable facilitating bonds are ten 10s = 100, ten 100s = 1000, additions like $2 + 2$, $3 + 3$, and $4 + 4$, and all the multiplication tables to 9×9 .

In consideration of these three modifying cases or principles, a volume could well be written concerning just how much practice to give to each bond, in each of the types of complex situations where it has to operate. There is evidently need for much experimentation to expose the facts, and for much sagacity and inventiveness in making sure of effective learning without wasteful overlearning.

The facts of primary importance are:—

- (1) The textbook or other instrument of instruction which is a teacher's general guide may give far too little practice on certain bonds.
- (2) It may divide the practice given in ways that are apparently unjustifiable.
- (3) The teacher needs therefore to know how much practice it does give, where to supplement it, and what to omit.
- (4) The omissions, on grounds of apparent excess practice, should be made only after careful consideration of the third principle described above.
- (5) The amount of practice should always be considered in the light of its interest and appeal to the pupil's tendency to work with full power and zeal. Mere repetition of bonds when the learner does not care whether he is improving is rarely justifiable on any grounds.
- (6) Practice that is actually in excess is not a very grave defect if it is enjoyed and improves the pupil's attitude toward arithmetic. Not much time is lost; a hundred practices for each of a thousand bonds after

mastery to 199 in 200 at 2 seconds will use up less than 60 hours, or 15 hours per year in grades 3 to 6.

- (7) By the proper division of practice among bonds, the arrangement of learning so that each bond helps the others, the adroit shifting of practice of a bond to each new type of situation requiring it to operate under changed conditions, and the elimination of excess practice where nothing substantial is gained, notable improvements over the past hit-and-miss customs may be expected.
- (8) Unless the material for practice is adequate, well balanced and sufficiently motivated, the teacher must keep close account of the learning of pupils. Otherwise disastrous underlearning of many bonds is almost sure to occur and retard the pupil's development.

THE ORGANIZATION OF ABILITIES

There is danger that the need of brevity and simplicity which has made us speak so often of a bond or an ability, and of the amount of practice it requires, may mislead the reader into thinking that these bonds and abilities are to be formed each by itself alone and kept so. They should rarely be formed so and never kept so. This we have indicated from time to time by references to the importance of forming a bond in the way in which it is to be used, to the action of bonds in changed situations, to facilitation of one bond by others, to the coöperation of abilities, and to their integration into a total arithmetical ability.

As a matter of fact, only a small part of drill work in arithmetic should be the formation of isolated bonds. Even the very young pupil learning 5 and 3 are 8 should learn it with '5 and 5 = 10,' '5 and 2 = 7,' at the back of his mind, so to speak. Even so early, $5 + 3 = 8$ should be part of an organized, coöperating system of bonds. Later $50 + 30 = 80$ should become allied to it. Each bond should be considered, not simply as a separate tool to be put in a compartment until needed, but also as an improvement of one total tool or machine, arithmetical ability.

There are differences of course. Knowledge of square root can be regarded somewhat as a separate tool to be sharpened, polished, and used by

itself, whereas knowledge of the multiplication tables cannot. Yet even square root is probably best made more closely a part of the total ability, being taught as a special case of dividing where divisor is to be the same as quotient, the process being one of estimating and correcting.

In general we do not wish the pupil to be a repository of separated abilities, each of which may operate only if you ask him the sort of questions which the teacher used to ask him, or otherwise indicate to him which particular arithmetical tool he is to use. Rather he is to be an effective organization of abilities, coöperating in useful ways to meet the quantitative problems life offers. He should not as a rule have to think in such fashion as: "Is this interest or discount? Is it simple interest or compound interest? What did I do in compound interest? How do I multiply by 2 percent?" The situation that calls up interest should also call up the kind of interest that is appropriate, and the technique of operating with percents should be so welded together with interest in his mind that the right coöperation will occur almost without supervision by him.

As each new ability is acquired, then, we seek to have it take its place as an improvement of a thinking being, as a coöperative member of a total organization, as a soldier fighting together with others, as an element in an educated personality. Such an organization of bonds will not form itself any more than any one bond will create itself. If the elements of arithmetical ability are to act together as a total organized unified force they must be made to act together in the course of learning. What we wish to have work together we must put together and give practice in teamwork.

We can do much to secure such coöperative action when and where and as it is needed by a very simple expedient; namely, to give practice with computation and problems such as life provides, instead of making up drills and problems merely to apply each fact or principle by itself. Though a pupil has solved scores of problems reading, "A triangle has a base of a feet and an altitude of b feet, what is its area?" he may still be practically helpless in finding the area of a triangular plot of ground; still more helpless in using the formula for a triangle which is one of two into which a trapezoid is divided. Though a pupil has learned to solve problems in trade discount, simple interest, compound interest, and bank discount one at a time, stated in a few set forms, he may be practically helpless before the actual series of problems confronting him in starting in business, and may take money out of the

savings bank when he ought to borrow on a time loan, or delay payment on his bills when by paying cash he could save money as well as improve his standing with the wholesaler.

Instead of making up problems to fit the abilities given by school instruction, we should preferably modify school instruction so that arithmetical abilities will be organized into an effective total ability to meet the problems that life will offer. Still more generally, *every bond formed should be formed with due consideration of every other bond that has been or will be formed; every ability should be practiced in the most effective possible relations with other abilities.*

CHAPTER VII

THE SEQUENCE OF TOPICS: THE ORDER OF FORMATION OF BONDS

The bonds to be formed having been chosen, the next step is to arrange for their most economical order of formation—to arrange to have each help the others as much as possible—to arrange for the maximum of facilitation and the minimum of inhibition.

The principle is obvious enough and would probably be admitted in theory by any intelligent teacher, but in practice we are still wedded to conventional usages which arose long before the psychology of arithmetic was studied. For example, we inherit the convention of studying addition of integers thoroughly, and then subtraction, and then multiplication, and then division, and many of us follow it though nobody has ever given a proof that this is the best order for arithmetical learning. We inherit also the opposite convention of studying in a so-called "spiral" plan, a little addition, subtraction, multiplication, and division, and then some more of each, and then some more, and many of us follow this custom, with an unreasoned faith that changing about from one process to another is *per se* helpful.

Such conventions are very strong, illustrating our common tendency to cherish most those customs which we cannot justify! The reductions of denominate numbers ascending and descending were, until recently, in most courses of study, kept until grade 4 or grade 5 was reached, although this material is of far greater value for drills on the multiplication and division tables than the customary problems about apples, eggs, oranges, tablets, and penholders. By some historical accident or for good reasons the general treatment of denominate numbers was put late; by our naïve notions of order and system we felt that any use of denominate numbers before this time was heretical; we thus became blind to the advantages of quarts and pints for the tables of 2s; yards and feet for the tables of 3s; gallons and quarts for the

tables of 4s; nickels and cents for the 5s; weeks and days for the 7s; pecks and quarts for the 8s; and square yards and square feet for the 9s. Problems like 5 yards = ___ feet or 15 feet = ___ yards have not only the advantages of brevity, clearness, practical use, real reference, and ready variation, but also the very great advantage that part of the data have to be *thought of* in a useful way instead of *read off* from the page. In life, when a person has twenty cents with which to buy tablets of a certain sort, he *thinks of* the price in making his purchase, asking it of the clerk only in case he does not know it, and in planning his purchases beforehand he *thinks of* prices as a rule. In spite of these and other advantages, not one textbook in ten up to 1900 made early use of these exercises with denominate numbers. So strong is mere use and wont.

Besides these conventional customs, there has been, in those responsible for arithmetical instruction, an admiration for an arrangement of topics that is easy for a person, after he knows the subject, to use in thinking of its constituent parts and their relations. Such arrangements are often called 'logical' arrangements of subject matter, though they are often far from logical in any useful sense. Now the easiest order in which to think of a hierarchy of habits after you have formed them all may be an extremely difficult order in which to form them. The criticism of other orders as 'scrappy,' or 'unsystematic,' valid enough if the course of study is thought of as an object of contemplation, may be foolish if the course of study is regarded as a working instrument for furthering arithmetical learning.

We must remember that all our systematizing and labeling is largely without meaning to the pupils. They cannot at any point appreciate the system as a progression from that point toward this and that, since they have no knowledge of the 'this or that.' They do not as a rule think of their work in grade 4 as an outcome of their work in grade 3 with extensions of a to a_1 , and additions of b_2 and b_3 to b and b_1 , and refinements of c and d by c_4 and d_5 . They could give only the vaguest account of what they did in grade 3, much less of why it should have been done then. They are not much disturbed by a lack of so-called 'system' and 'logical' progression for the same reason that they are not much helped by their presence. What they need and can use is a *dynamically* effective system or order, one that they can learn easily and retain long by, regardless of how it would look in a museum of arithmetical systems. Unless their actual arithmetical habits are usefully

related it does no good to see the so-called logical relations; and if their habits are usefully related, it does not very much matter whether or not they do see these; finally, they can be brought to see them best by first acquiring the right habits in a dynamically effective order.

DECREASING INTERFERENCE AND INCREASING FACILITATION

Psychology offers no single, easy, royal road to discovering this dynamically best order. It can only survey the bonds, think what each demands as prerequisite and offers as future help, recommend certain orders for trial, and measure the efficiency of each order as a means of attaining the ends desired. The ingenious thought and careful experimentation of many able workers will be required for many years to come.

Psychology can, however, even now, give solid constructive help in many instances, either by recommending orders that seem almost certainly better than those in vogue, or by proposing orders for trial which can be justified or rejected by crucial tests.

Consider, for example, the situation, 'a column of one-place numbers to be added, whose sum is over 9,' and the response 'writing down the sum.' This bond is commonly firmly fixed before addition with two-place numbers is undertaken. As a result the pupil has fixed a habit that he has to break when he learns two-place addition. If *oral* answers only are given with such single columns until two-place addition is well under way, the interference is avoided.

In many courses of study the order of systematic formation of the multiplication table bonds is : 1×1 , 2×1 , etc., 1×2 , 2×2 , etc., 1×3 , 2×3 , etc., 1×9 , 2×9 , etc. This is probably wrong in two respects. There is abundant reason to believe that the $\times 5$ s should be learned first, since they are easier to learn than the 1s or the 2s, and give the idea of multiplying more emphatically and clearly. There is also abundant reason to believe that the 1×5 , 1×2 , 1×3 , etc., should be put very late—after at least three or four tables are learned, since the question "What is 1 times 2?" (or 3 or 5) is unnecessary until we come to multiplication of two- and three-place numbers, seems a foolish question until then, and obscures the notion of

multiplication if put early. Also the facts are best learned once for all as the habits "1 times k is the same as k ," and " k times 1 is the same as k ."^[8]

In another connection it was recommended that the divisions to $81 \div 9$ be learned by selective thinking or reasoning from the multiplications. This determines the order of bonds so far as to place the formation of the division bonds soon after the learning of the multiplications. For other reasons it is well to make the proximity close.

One of the arbitrary systematizations of the order of formation of bonds restricts operations at first to the numbers 1 to 10, then to numbers under 100, then to numbers under 1000, then to numbers under 10,000. Apart from the avoidance of unreal and pedantic problems in applied arithmetic to which work with large numbers in low grades does somewhat predispose a teacher, there is little merit in this restriction of the order of formation of bonds. Its demerits are many. For example, when the pupil is learning to 'carry' in addition he can be given better practice by soon including tasks with sums above 100, and can get a valuable sense of the general use of the process by being given a few examples with three- and four-place numbers to be added. The same holds for subtraction. Indeed, there is something to be said in favor of using six- or seven-place numbers in subtraction, enforcing the 'borrowing' process by having it done again and again in the same example, and putting it under control by having the decision between 'borrowing' and 'not borrowing' made again and again in the same example. When the multiplication tables are learned the most important use for them is not in tedious reviews or trivial problems with answers under 100, but in regular 'short' multiplication of two- and three- and even four-place numbers. Just as the addition combinations function mainly in the higher-decade modifications of them, so the multiplication combinations function chiefly in the cases where the bond has to operate while the added tasks of keeping one's place, adding what has been carried, writing down the right figure in the right place, and holding the right number for later addition, are also taken care of. It seems best to introduce such short multiplication as soon as the $\times 5$ s, $\times 2$ s, $\times 3$ s, and $\times 4$ s are learned and to put the $\times 6$ s, $\times 7$ s, and the rest to work in such short multiplication as soon as each is learned.

Still surer is the need for four-, five-, and six-place numbers when two-place numbers are used in multiplying. When the process with a two-place

multiplier is learned, multiplications by three-place numbers should soon follow. They are not more difficult than later. On the contrary, if the pupil gets used to multiplying only as one does with two-place multipliers, he will suffer more by the resulting interference than he does from getting six- or seven-place answers whose meaning he cannot exactly realize. They teach the rationale and the manipulations of long multiplication with especial economy because the principles and the procedures are used two or three times over and the contrasts between the values which the partial products have in adding become three instead of one.

The entire matter of long multiplication with integers and United States money should be treated as a teaching unit and the bonds formed in close organization, even though numbers as large as 900,000 are occasionally involved. The reason is not that it is more logical, or less scrappy, but that each of the bonds in question thus gets much help from, and gives much help to, the others.

In sharp contrast to a topic like 'long multiplication' stands a topic like denominate numbers. It most certainly should not be treated as a large teaching unit, and all the bonds involved in adding, subtracting, multiplying, and dividing with all the ordinary sorts of measures should certainly not be formed in close sequence. The reductions ascending and descending for many of the measures should be taught as drills on the appropriate multiplication and division tables. The reduction of feet and inches to inches, yards and feet to yards, gallons and quarts to quarts, and the like are admirable exercises in connection with the $(a \times b) + c = \dots$ problems,—the 'Bought 3 lbs. of sugar at 7 cents and 5 cents worth of matches' problems. The reductions of inches to feet and inches and the like are admirable exercises in the $d = (\dots \times b) + c$ or 'making change' problem, which in its small-number forms is an excellent preparatory step for short division. They are also of great service in early work with fractions. The feet-mile, square-foot-square-inch, and other simple relations give a genuine and intelligible demand for multiplication with large numbers.

Knowledge of the metric system for linear and square measure would perhaps, as an introduction to decimal fractions, more than save the time spent to learn it. It would even perhaps be worth while to invent a measure (call it the *twoqua*) midway between the quart and gallon and teach carrying in addition and borrowing in subtraction by teaching first the addition and

subtraction of 'gallon, twoqua, quart, and pint' series! Many of the bonds which a system-made tradition huddled together uselessly in a chapter on denominate numbers should thus be formed as helpful preparations for and applications of other bonds all the way from the first to the eighth half-year of instruction in arithmetic.

The bonds involved in the ability to respond correctly to the series:—

$$5 = \dots 2s \text{ and } \dots \text{ remainder}$$

$$5 = \dots 3s \text{ and } \dots \text{ remainder}$$

$$88 = \dots 9s \text{ and } \dots \text{ remainder}$$

should be formed before, not during, the training in short division. They are admirable at that point as practice on the division tables; are of practical service in the making-change problems of the small purchase and the like; and simplify the otherwise intricate task of keeping one's place, choosing the quotient figure, multiplying by it, subtracting and holding in mind the new number to be divided, which is composed half of the remainder and half of a figure in the written dividend. This change of order is a good illustration of the nearly general rule that "*When the practice or review required to perfect or hold certain bonds can, by an inexpensive modification, be turned into a useful preparation for new bonds, that modification should be made.*"

The bonds involved in the four operations with United States money should be formed in grades 3 and 4 along with or very soon after the corresponding bonds with three-place and four-place integers. This statement would have seemed preposterous to the pedagogues of fifty years ago. "United States money," they would have said, "is an application of decimals. How can it be learned until the essentials of decimal fractions are known? How will the child understand when multiplying \$.75 by 3 that 3 times 5 cents is 1 dime and 5 cents, or that 3 times 70 cents is 2 dollars and 1 dime? Why perplex the young pupils with the difficulties of placing the decimal point? Why disturb the learning of the four operations with integers by adding at each step a second 'procedure with United States money'?"

The case illustrates very well the error of the older oversystematic treatment of the order of topics and the still more important error of confusing the logic of proof with the psychology of learning. To prove that $3 \times \$.75 = \2.25 to the satisfaction of certain arithmeticians, you may need to

know the theory of decimal fractions; but to do such multiplication all a child needs is to do just what he has been doing with integers and then "Put a \$ before the answer to show that it means dollars and cents, and put a decimal point in the answer to show which figures mean dollars and which figures mean cents." And this is general. The ability to operate with integers plus the two habits of prefixing \$ and separating dollars from cents in the result will enable him to operate with United States money.

Consequently good practice came to use United States money not as a consequence of decimal fractions, learned by their aid, but as an introduction to decimal fractions which aids the pupil to learn them. So it has gradually pushed work with United States money further and further back, though somewhat timidly.

We need not be timid. The pupil will have no difficulty in adding, subtracting, multiplying, and dividing with United States money—unless we create it by our explanations! If we simply form the two bonds described above and show by proper verification that the procedure always gives the right answer, the early teaching of the four operations with United States money will in fact actually show a learning profit! It will save more time in the work with integers than was spent in teaching it! For, in the first place, it will help to make work with four-place and five-place numbers more intelligible and vital. A pupil can understand \$16.75 or \$28.79 more easily than 1675 or 2879. The former may be the prices of a suit or sewing machine or bicycle. In the second place, it permits the use of a large stock of genuine problems about spending, saving, sharing, and the like with advertisements and catalogues and school enterprises. In the third place, it permits the use of common-sense checks. A boy may find one fourth of 3000 as 7050 or 75 and not be disturbed, but he will much more easily realize that one fourth of \$30.00 is not over \$7.50 or less than \$7.50. Even the decimal point of which we used to be so afraid may actually help the eye to keep its place in adding.

INTEREST

So far, the illustrations of improvements in the order of bonds so as to get less interference and more facilitation than the customary orders secure have sought chiefly to improve the mechanical organization of the bonds. Any gain in interest which the changes described effected would be largely due to

the greater achievement itself. Dewey and others have emphasized a very different principle of improving the order of formation of bonds—the principle of determination of the bonds to be formed by some vital, engaging problem which arouses interest enough to lighten the labor and which goes beyond or even against cut-and-dried plans for sequences in order to get effective problems. For example, the work of the first month in grade 2B might sacrifice facilitations of the mechanical sort in order to put arithmetic to use in deciding what dimensions a rabbit's cage should have to give him 12 square feet of floor space, how much bread he should have per meal to get 6 ounces a day, how long a ten-cent loaf would last, how many loaves should be bought per week, how much it costs to feed the rabbit, how much he has gained in weight since he was brought to the school, and so on.

Such sacrifices of the optimal order if interest were equal, in order to get greater interest or a healthier interest, are justifiable. Vital problems as nuclei around which to organize arithmetical learning are of prime importance. It is even safe probably to insist that some genuine problem-situation requiring a new process, such as addition with carrying, multiplication by two-place numbers, or division with decimals, be provided in every case as a part of the introduction to that process. The sacrifice should not be too great, however; the search for vital problems that fit an economical order of subject matter is as much needed as the amendment of that order to fit known interests; and the assurance that a problem helps the pupil to learn arithmetic is as important as the assurance that arithmetic is used to help the pupil solve his personal problems.

Much ingenuity and experimentation will be required to find the order that is satisfactory in both quality and quantity of interest or motive and helpfulness of the bonds one to another. The difficulty of organizing arithmetic around attractive problems is much increased by the fact of class instruction. For any one pupil vital, personal problems or projects could be found to provide for many arithmetical abilities; and any necessary knowledge and technique which these projects did not develop could be somehow fitted in along with them. But thirty children, half boys and half girls, varying by five years in age, coming from different homes, with different native capacities, will not, in September, 1920, unanimously feel a vital need to solve any one problem, and then conveniently feel another on, say, October 15! In the mechanical laws of learning children are much alike,

and the gain we may hope to make from reducing inhibitions and increasing facilitations is, for ordinary class-teaching, probably greater than that to be made from the discovery of attractive central problems. We should, however, get as much as possible of both.

GENERAL PRINCIPLES

The reader may by now feel rather helpless before the problem of the arrangement of arithmetical subject matter. "Sometimes you complete a topic, sometimes you take it piecemeal months or years apart, often you make queer twists and shifts to get a strategic advantage over the enemy," he may think, "but are there no guiding principles, no general rules?" There is only one that is absolutely general, to *take the order that works best for arithmetical learning*. There are particular rules, but there are so many and they are so limited by an 'other things being equal' clause, that probably a general eagerness to think out the *pros* and *cons* for any given proposal is better than a stiff attempt to adhere to these rules. I will state and illustrate some of them, and let the reader judge.

Other things being equal, one new sort of bonds should not be started until the previous set is fairly established, and two different sets should not be started at once. Thus, multiplication of two- and three-place numbers by 2, 3, 4, and 5 will first use numbers such that no carrying is required, and no zero difficulties are encountered, then introduce carrying, then introduce multiplicands like 206 and 320. If other things were equal, the carrying would be split into two steps—first drills with $(4 \times 6) + 2$, $(3 \times 7) + 3$, $(5 \times 4) + 1$, and the like, and second the actual use of these habits in the multiplication. The objection to this separation of the double habit is that the first part of it in isolation is too artificial—that it may be better to suffer the extra difficulty of forming the two together than to teach so rarely used habits as the $(a \times b) + c$ series. Experimental tests are needed to decide this point.

Other things being equal, bonds should be formed in such order that none will have to be broken later. For example, there is a strong argument for teaching long division first, or very early, with remainders, letting the case of zero remainder come in as one of many. If the pupils have been familiarized with the remainder notion by the drills recommended as preparation for short

division,^[9] the use of remainders in long division will offer little difficulty. The exclusive use of examples without remainders may form the habit of not being exact in computation, of trusting to 'coming out even' as a sole check, and even of writing down a number to fit the final number to be divided instead of obtaining it by honest multiplication.

For similar reasons additions with 2 and 3 as well as 1 to be 'carried' have much to recommend them in the very first stages of column addition with carrying. There is here the added advantage that a pupil will be more likely to remember to carry if he has to think *what* to carry. The present common practice of using small numbers for ease in the addition itself teaches many children to think of carrying as adding one.

Other things being equal, arrange to have variety. Thus it is probably, though not surely, wise to interrupt the monotony of learning the multiplication and division tables, by teaching the fundamentals of 'short' multiplication and perhaps of division after the 5s, 2s, 3s, and 4s are learned. This makes a break of several weeks. The facts for the 6s, 7s, 8s, and 9s can then be put to varied use as fast as learned. It is almost certainly wise to interrupt the first half-year's work with addition and subtraction, by teaching 2×2 , 2×3 , 3×2 , 2×4 , 4×2 , 2×5 , later by 2×10 , 3×10 , 4×10 , 5×10 , later by $\frac{1}{2} + \frac{1}{2}$, $1\frac{1}{2} + \frac{1}{2}$, $\frac{1}{2}$ of 2, $\frac{1}{2}$ of 4, $\frac{1}{2}$ of 6, and at some time by certain profitable exercises wherein a pupil tells all he knows about certain numbers which may be made nuclei of important facts (say, 5, 8, 10, 12, 15, and 20).

Other things being equal, use objective aids to verify an arithmetical process or inference after it is made, as well as to provoke it. It is well at times to let pupils do everything that they can with relations abstractly conceived, testing their results by objective counting, measuring, adding, and the like. For example, an early step in adding should be to show three things, put them under a book, show two more, put these under the book, and then ask how many there are under the book, letting the objective counting come later as the test of the correctness of the addition.

Other things being equal, reserve all explanations of why a process must be right until the pupils can use the process accurately, and have verified the fact that it is right. Except for the very gifted pupils, the ordinary preliminary deductive explanations of what must be done are probably useless as means of teaching the pupils what to do. They use up much time

and are of so little permanent effect that, as we have seen, the very arithmeticians who advocate making them, admit that after a pupil has mastered the process he may be allowed to forget the reasons for it. I am not sure that the deductive proofs of why we place the decimal point as we do in division by a decimal, or invert and multiply in dividing by a fraction, and the like, are worth teaching at all. If they are to be taught at all, the time to teach them is (except for the very gifted) after the pupil has mastered the process and has confidence in it. He then at least knows what process he is to prove is right, and that it is right, and has had some chance of seeing *why* it is right from his experience with it.

One more principle may be mentioned without illustration. *Arrange the order of bonds with due regard for the aims of the other studies of the curriculum and the practical needs of the pupil outside of school.* Arithmetic is not a book or a closed system of exercises. It is the quantitative work of the pupils in the elementary school. No narrower view of it is adequate.

CHAPTER VIII

THE DISTRIBUTION OF PRACTICE

THE PROBLEM

The same amount of practice may be distributed in various ways. Figures 7 to 10, for example, show 200 practices with division by a fraction distributed over three and a half years of 10 months in four different ways. In Fig. 7, practice is somewhat evenly distributed over the whole period. In Fig. 8 the practice is distributed at haphazard. In Fig. 9 there is a first main learning period, a review after about ten weeks, a review at the beginning of the seventh grade, another review at the beginning of the eighth grade, and some casual practice rather at random. In Fig. 10 there is a main learning period, with reviews diminishing in length and separated by wider and wider intervals, with occasional practice thereafter to keep the ability alive and healthy.

Plans I and II are obviously inferior to Plans III and IV; and Plan IV gives promise of being more effective than Plan III, since there seems danger that the pupil working by Plan III might in the ten weeks lose too much of what he had gained in the initial practice, and so again in the next ten weeks.

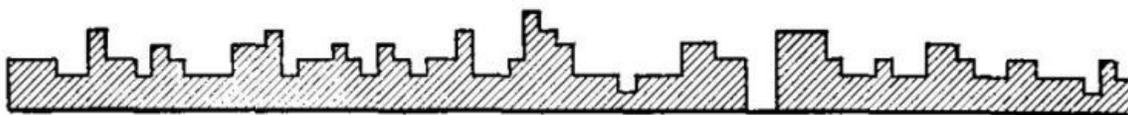


FIG. 7.—Plan I. 200 practices distributed somewhat evenly over $3\frac{1}{2}$ years of 10 months. In Figs. 7, 8, 9, and 10, each tenth of an inch along the base line represents one month. Each hundredth of a square inch represents four practices, a little square $\frac{1}{20}$ of an inch wide and $\frac{1}{20}$ inch high representing one practice.

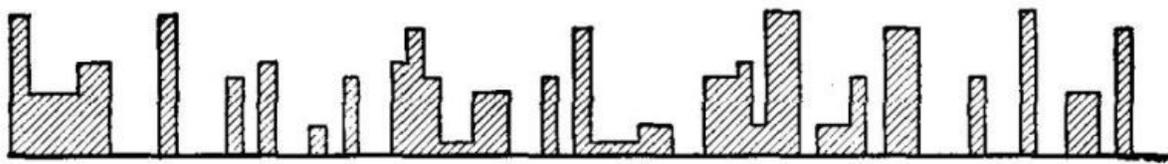


FIG. 8.—Plan II. 200 practices distributed haphazard over 3½ years of 10 months.

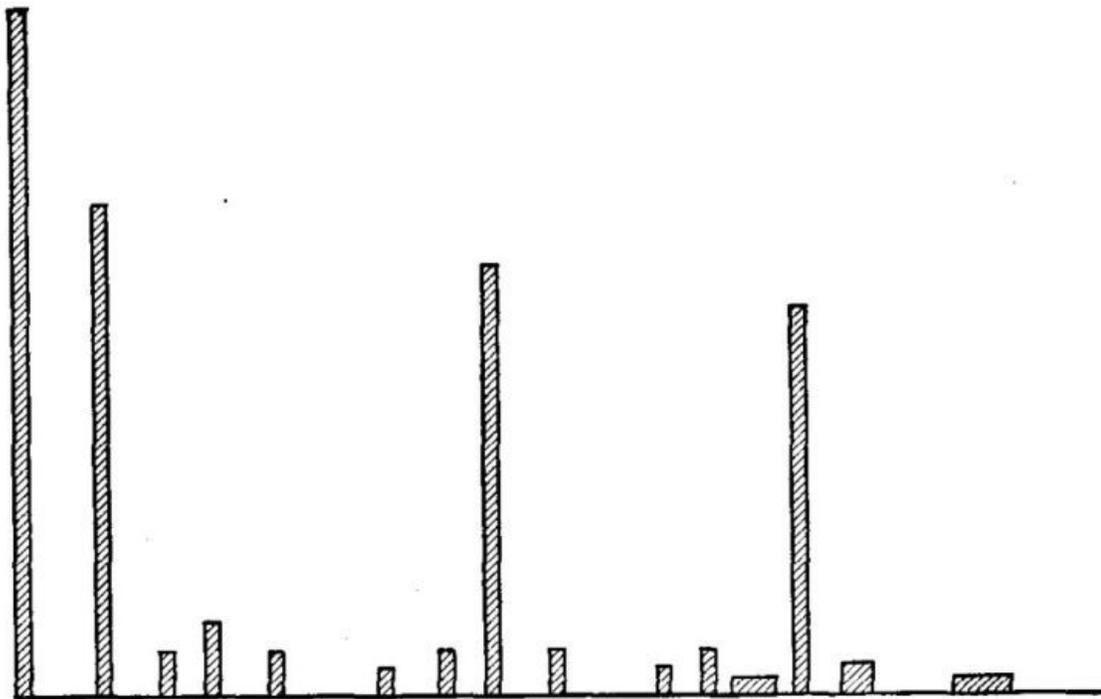


FIG. 9.—Plan III. A learning period, three reviews, and incidental practice.

It is not wise, however, to try now to make close decisions in the case of practice with division by a fraction; or to determine what the best distribution of practice is for that or any other ability to be improved. The facts of psychology are as yet not adequate for very close decisions, nor are the types of distribution of practice that are best adapted to different abilities even approximately worked out.

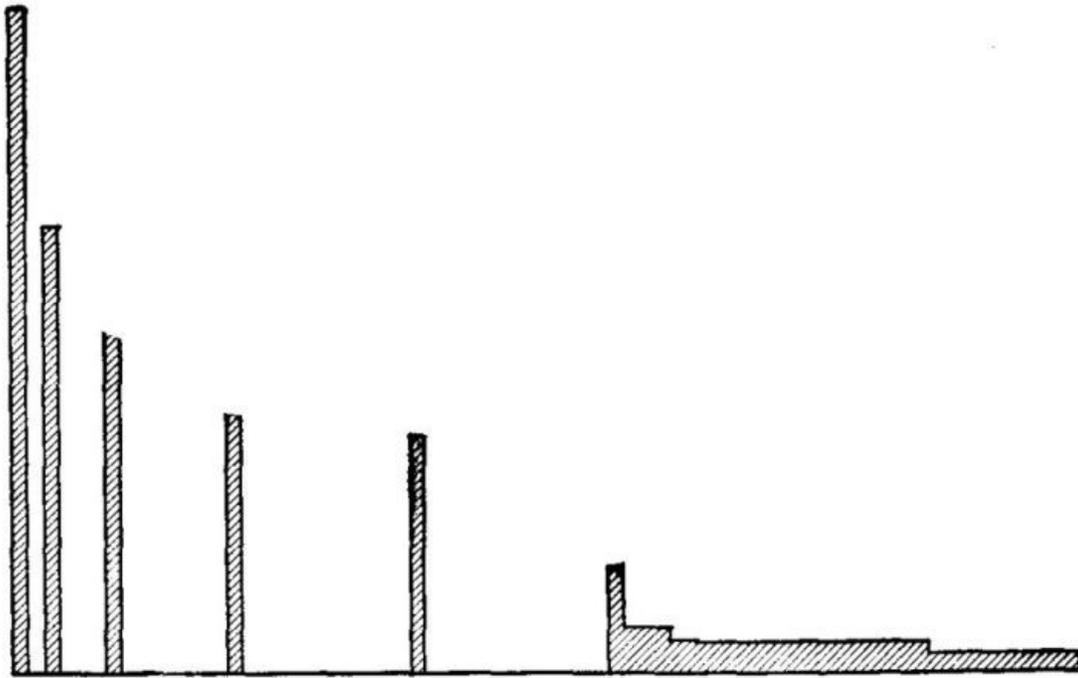


FIG. 10.—Plan IV. A learning period with reviews of decreasing length at increasing intervals.

SAMPLE DISTRIBUTIONS

Let us rather examine some actual cases of distribution of practice found in school work and consider, not the attainment of the best possible distribution, but simply the avoidance of gross blunders and the attainment of reasonable, defensible procedures in this regard.

Figures 11 to 18 show the distribution of examples in multiplication with multipliers of various sorts. *X* stands for any digit except zero. *O* stands for 0. *XXO* thus means a multiplier like 350 or 270 or 160; *XOX* means multipliers like 407, 905, or 206; *XX* means multipliers like 25, 17, 38. Each of these diagrams covers approximately 3½ years of school work, or from about the middle of grade 3 to the end of grade 6. They are made from counts of four textbooks (A, B, C, and D), the count being taken for each successive 8 pages.^[10] Each tenth of an inch along the base line equals 8 pages of the text in question. Each .01 sq. in. equals one example. The books, it will be observed, differ in the amount of practice given, as well as in the way in which it is distributed.

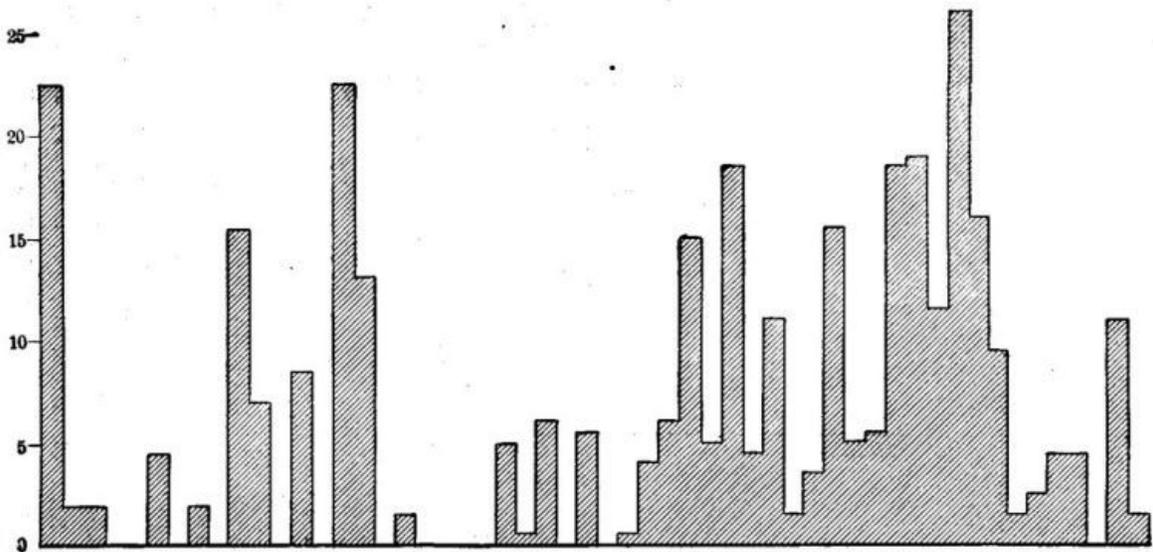


FIG. 11.—Distribution of practise with multipliers of the *XX* type in the first two books of the three-book text A.

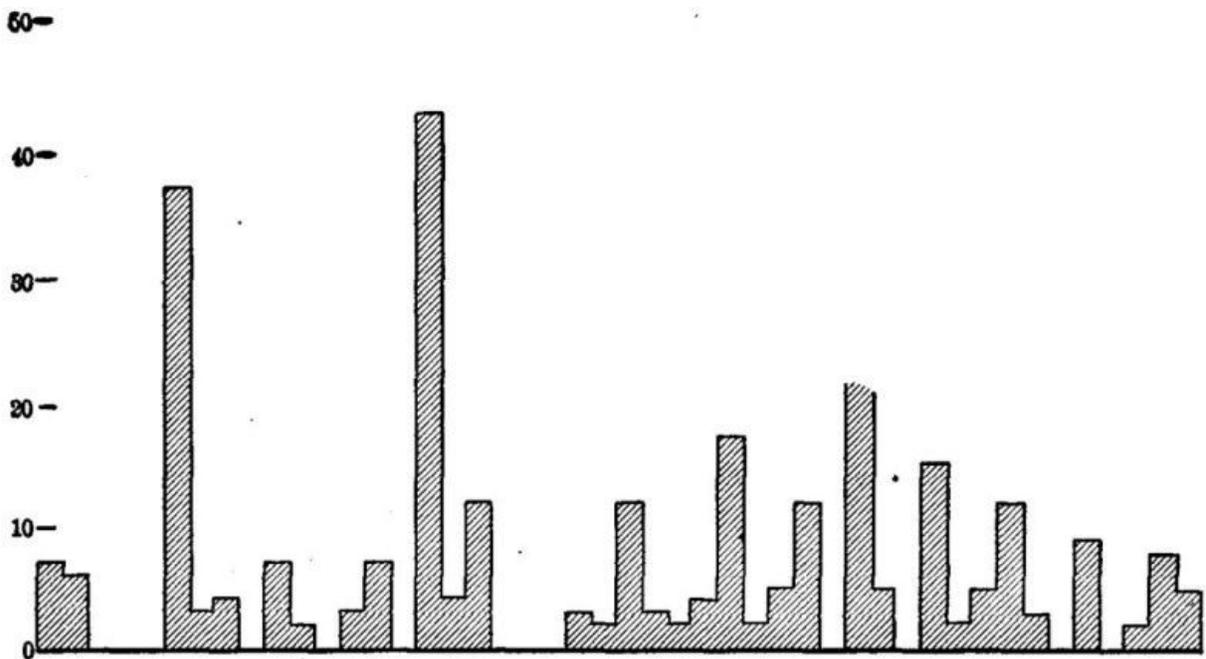


FIG. 12.—Same as Fig. 11, but for text B. Following this period come certain pages of computation to be used by the teacher at her discretion, containing 24 *XX* multiplications.

These distributions are worthy of careful study; we shall note only a few salient facts about them here. Of the distributions of multiplications with multipliers of the *XX* type, that of book D (Fig. 14) is perhaps the best. A

(Fig. 11) has too much of the practice too late; B (Fig. 12) gives too little practice in the first learning; C (Fig. 13) gives too much in the first learning and in grade 6. Among the distributions of multiplication with multipliers of the *XOX* type, that of book D (Fig. 18) is again probably the best. A, B, and C (Figs. 15, 16, and 17) have too much practice early and too long intervals between reviews. Book C (Fig. 17) by a careless oversight has one case of this very difficult process, without any explanation, weeks before the process is taught!

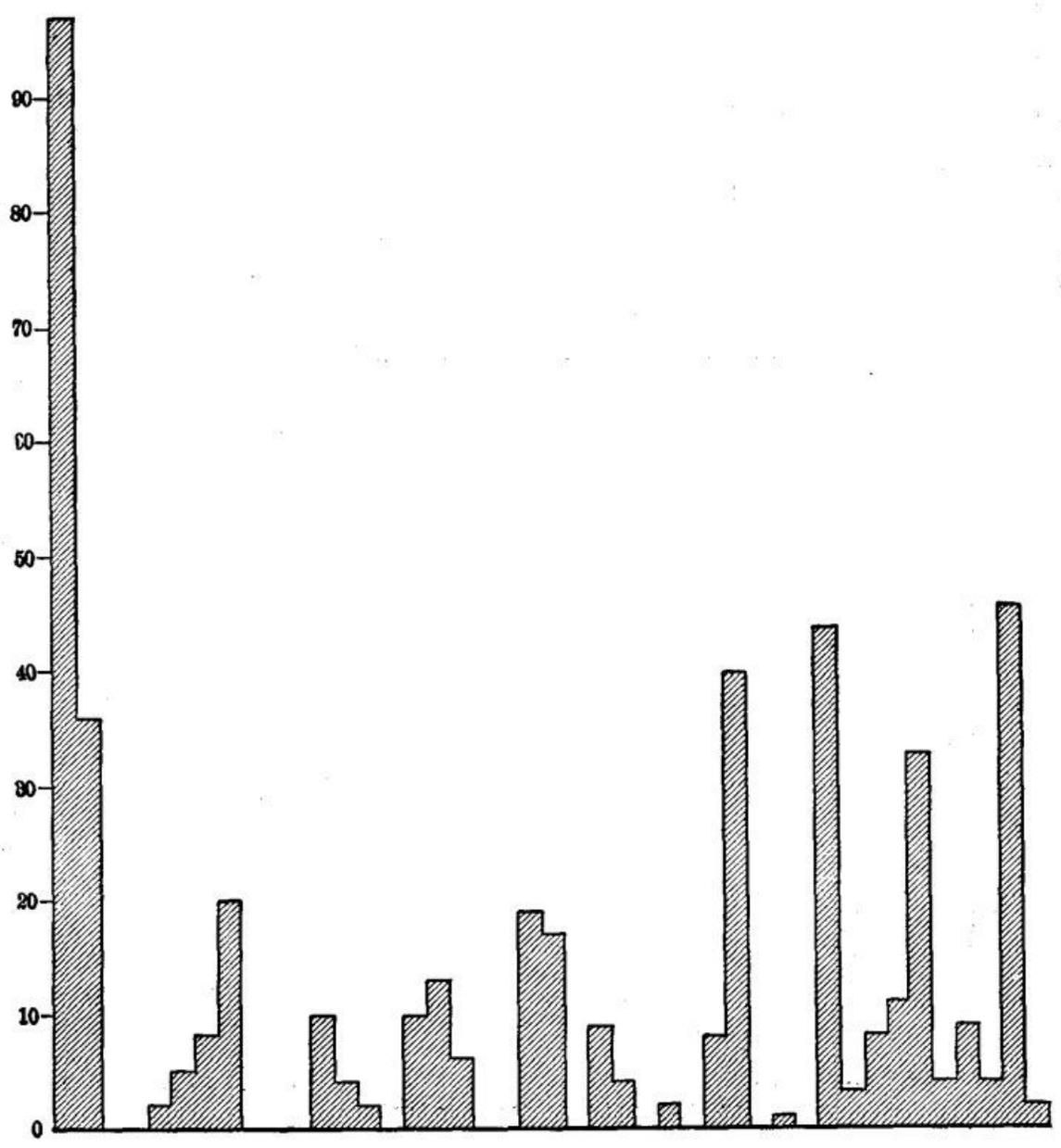


FIG. 13.—Same as Fig. 11, but for text C.

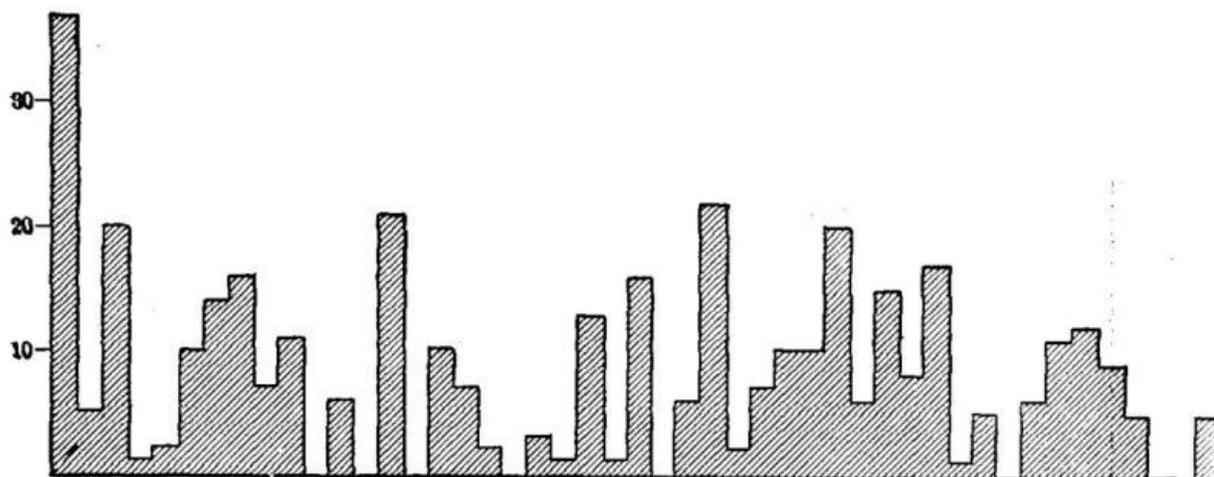


FIG. 14.—Same as Fig. 11, but for text D.

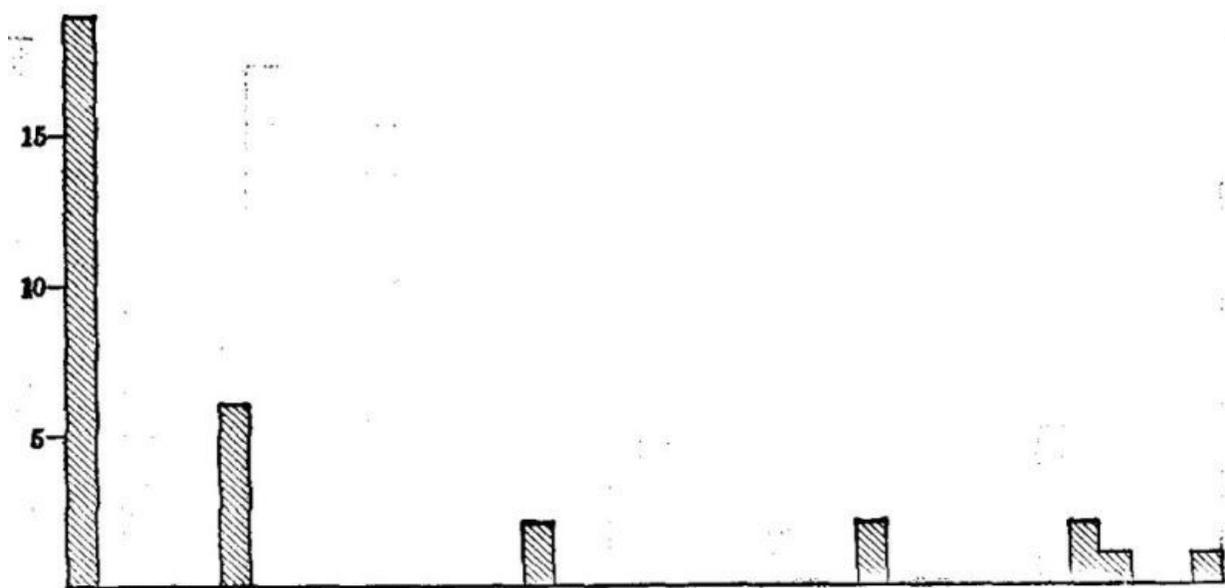


FIG. 15.—Distribution of practice with multipliers of the *XOX* type in the first two books of the three-book text A.

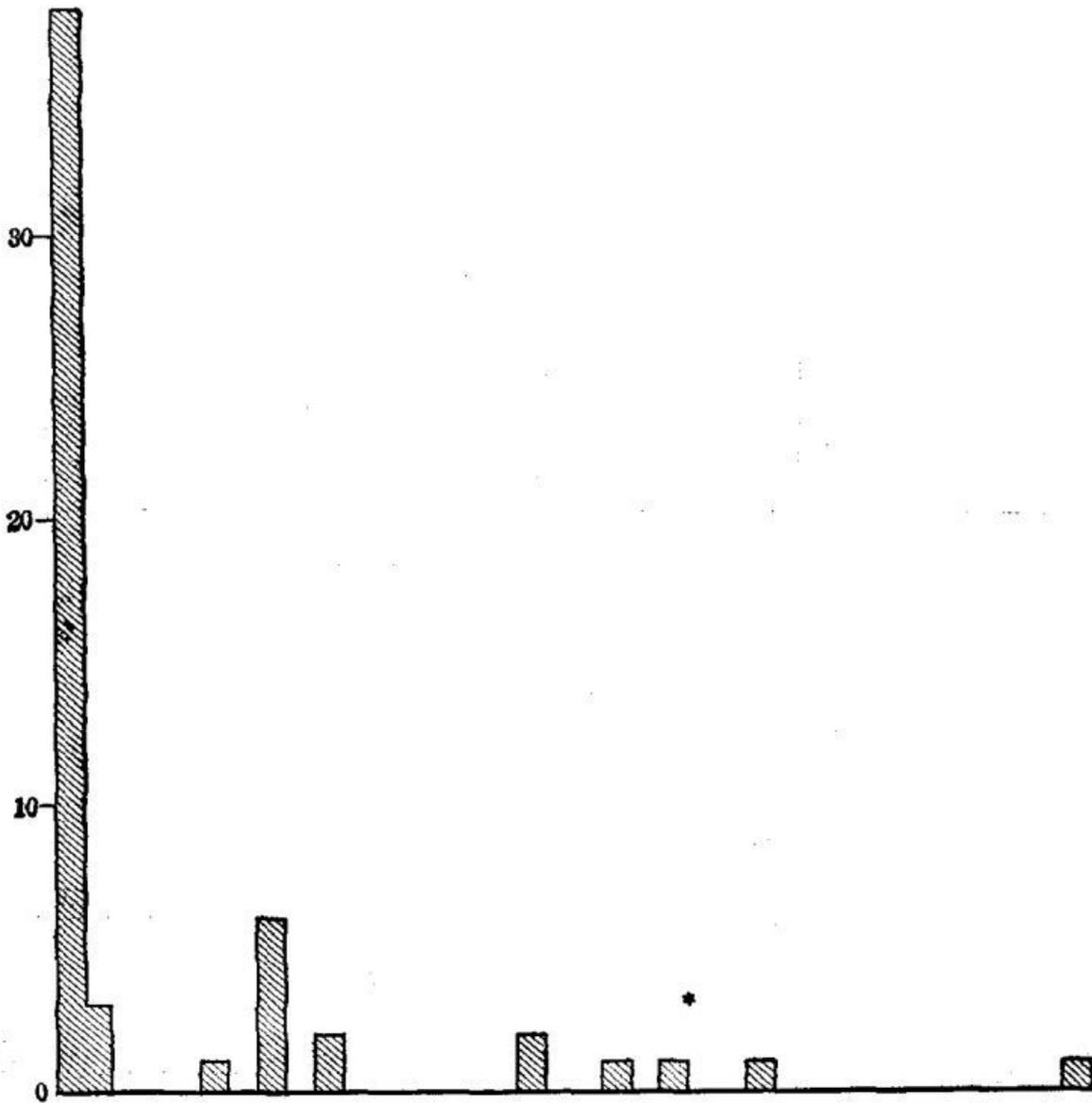


FIG. 16.—Same as Fig. 15, but for text B. Following this period come certain pages of computation to be used by the teacher at her discretion, containing 17 *XOX* multiplications.

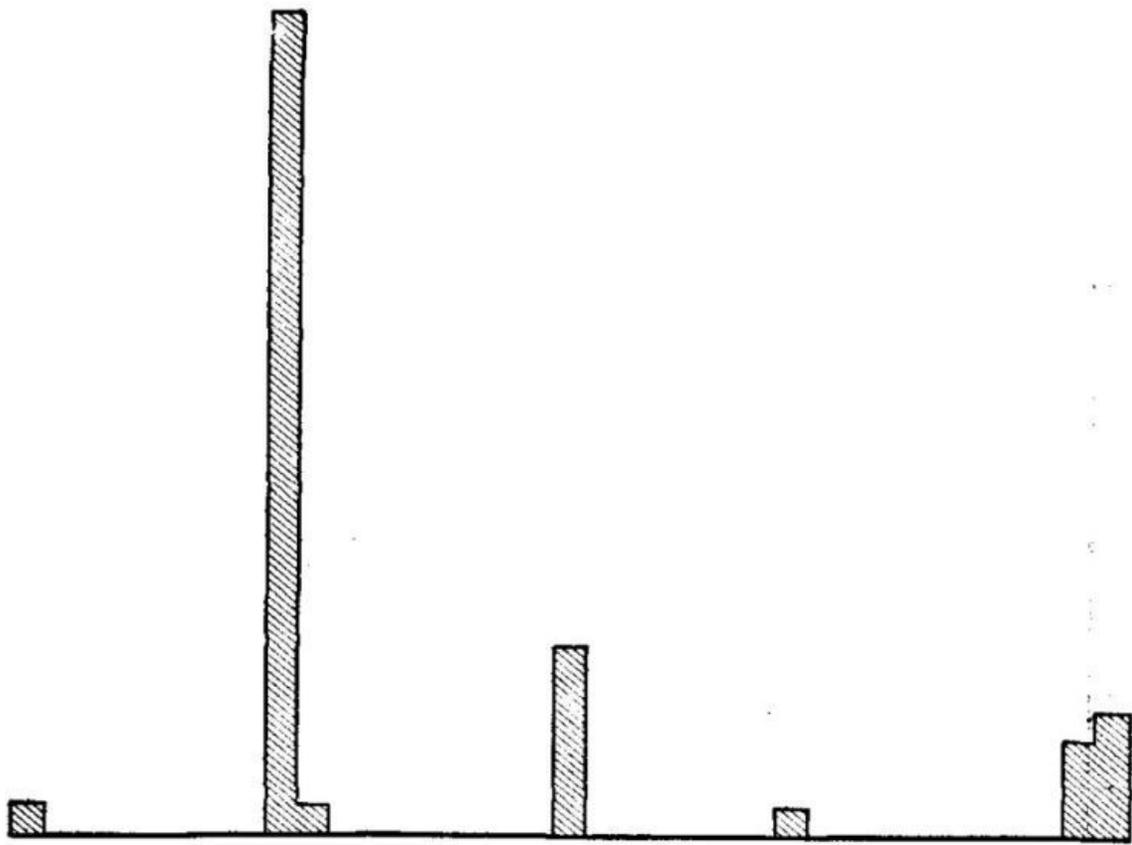


FIG. 17.—Same as Fig. 16, but for text C.

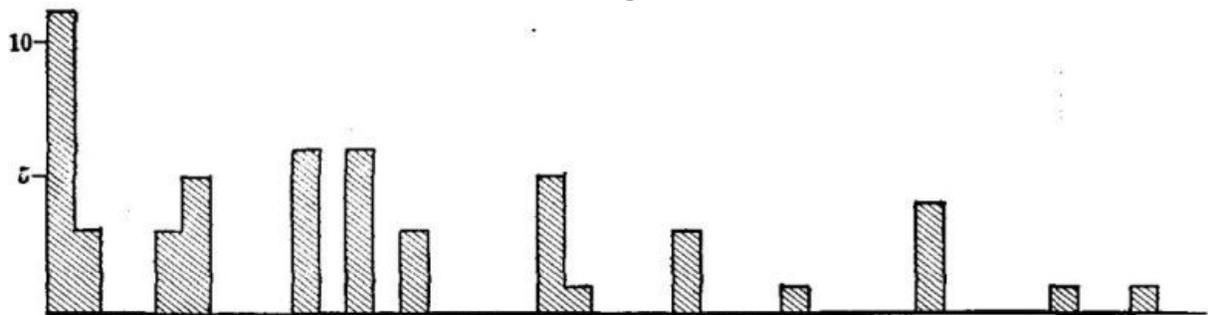


FIG. 18.—Same as Fig. 16, but for text D.

Figures 19, 20, 21, 22, and 23 all concern the first two books of the three-book text E.

Figure 19 shows the distribution of practice on 5×5 in the first two books of text E. The plan is the same as in Figs. 11 to 18, except that each tenth of an inch along the base line represents ten pages. Figure 20 shows the distribution of practice on 7×7 ; Fig. 21 shows it for 6×7 and 7×6

together. In Figs. 20 and 21 also, 0.1 inch along the base line equals ten pages.

Figures 22 and 23 show the distribution of practice on the divisions of 72, 73, 74, 75, 76, 77, 78, and 79 by either 8 or 9, and on the divisions of 81, 82 ... 89 by 9. Each tenth of an inch along the base line represents ten pages here also.

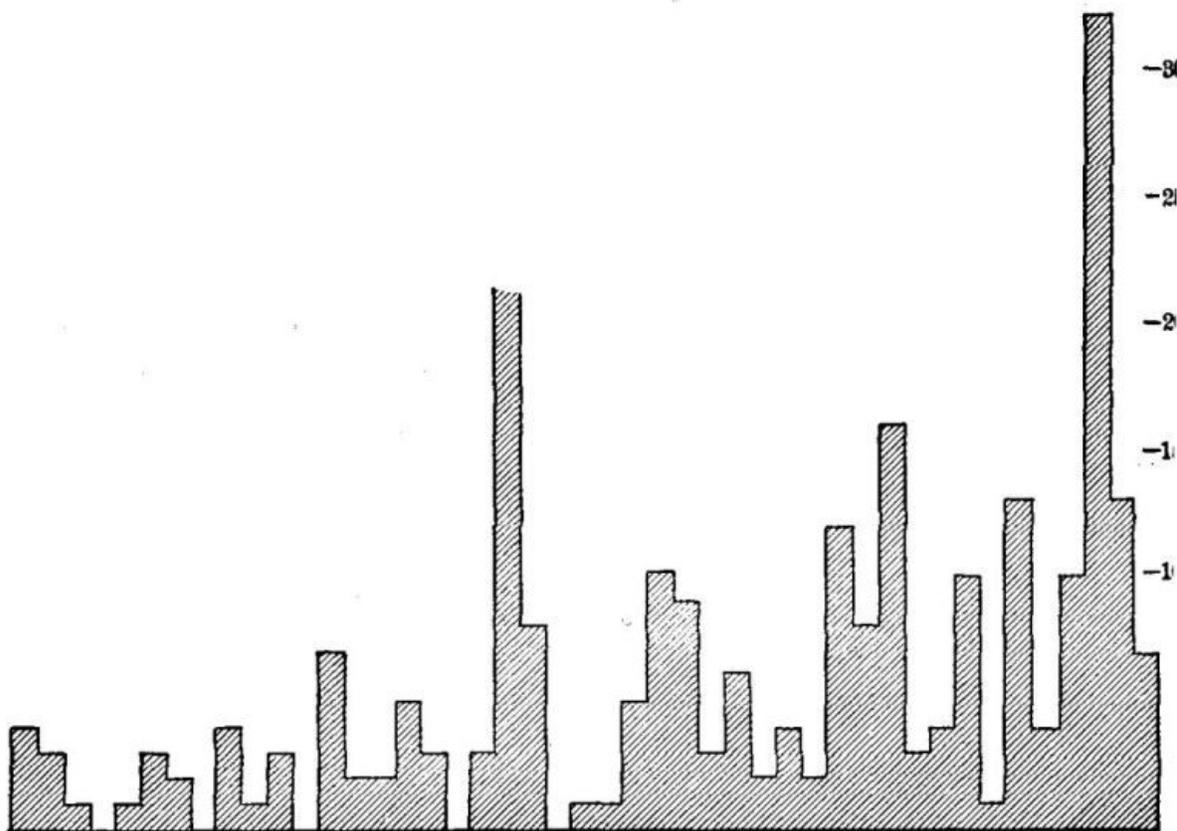


FIG. 19.—Distribution of practice with 5×5 in the first two books of the three-book text E.

Figures 19 to 23 show no consistent plan for distributing practice. With 5×5 (Fig. 19) the amount of practice increases from the first treatment in grade 3 to the end of grade 6, so that the distribution would be better if the pupil began at the end and went backward! With 7×7 (Fig. 20) the practice is distributed rather evenly and in small doses. With 6×7 and 7×6 (Fig. 21) much of it is in very large doses. With the divisions (Figs. 22 and 23) the practice is distributed more suitably, though in Fig. 23 there is too much of it given at one time in the middle of the period.

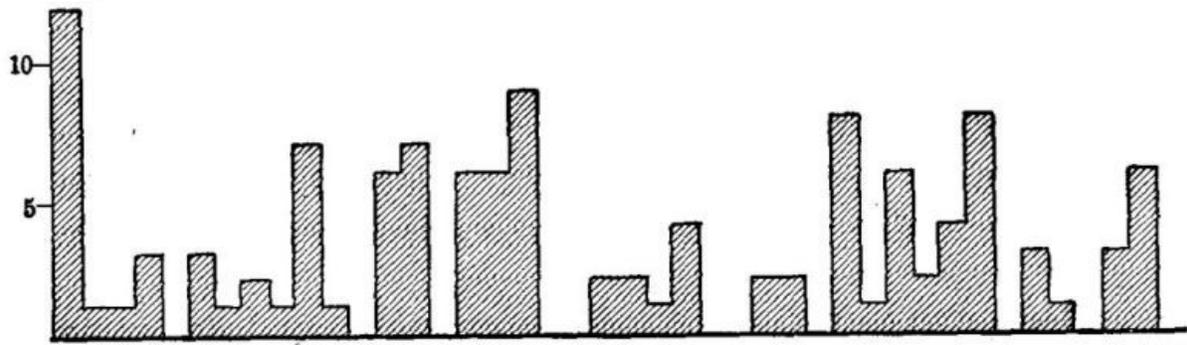


FIG. 20.—Distribution of practice with 7×7 in the first two books of text E.

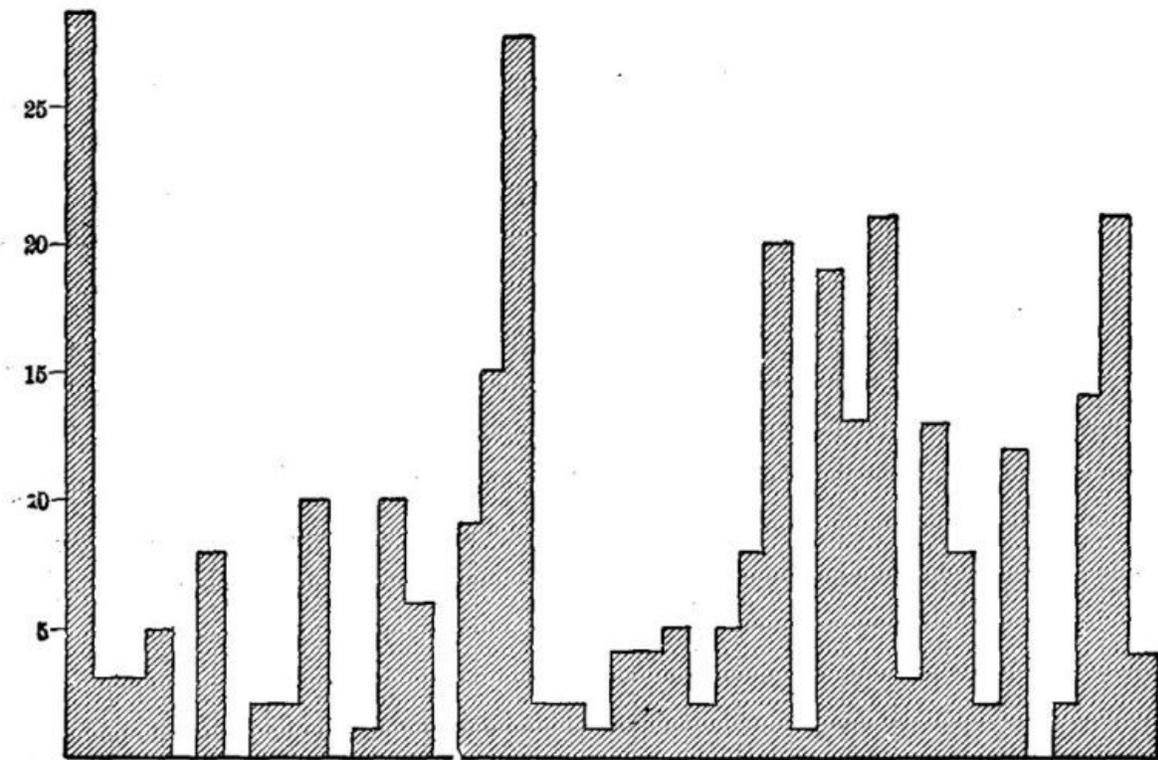


FIG. 21.—Distribution of practice with 6×7 or 7×6 in the first two books of text E.

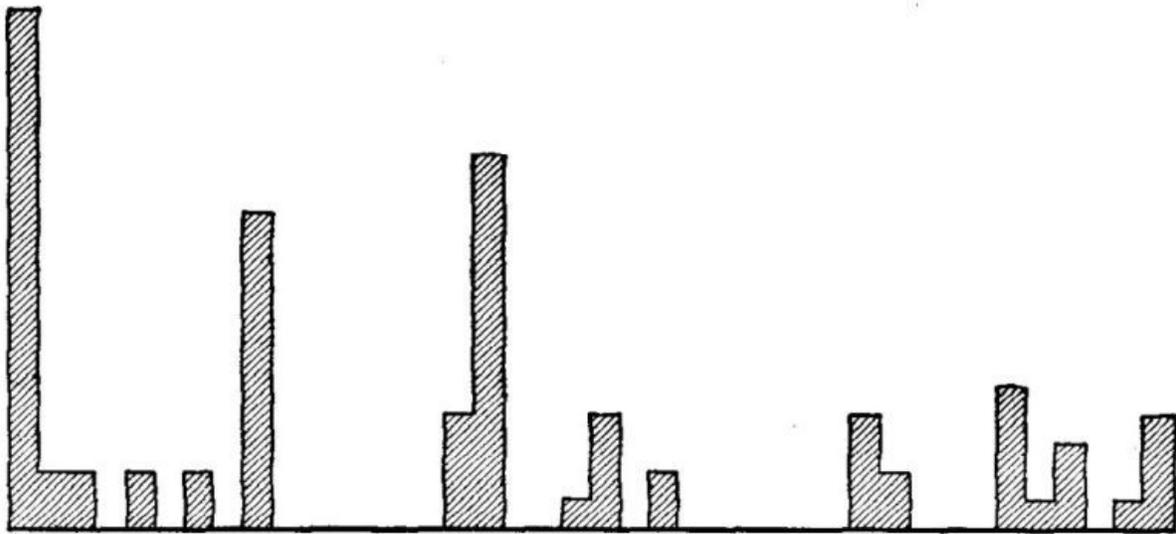


FIG. 22.—Distribution of practice with $72, 73 \dots 79 \div 8$ or 9 in the first two books of text E.

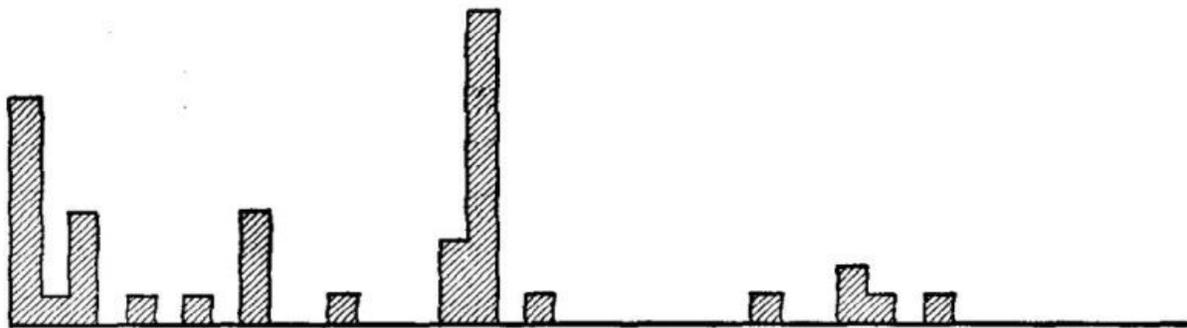


FIG. 23.—Distribution of practice with $81, 82 \dots 89 \div 9$ in the first two books of text E.

POSSIBLE IMPROVEMENTS

Even if we knew what the best distribution of practice was for each ability of the many to be inculcated by arithmetical instruction, we could perhaps not provide it for all of them. For, in the first place, the allotments for some of them might interfere with those for others. In the second place, there are many other considerations of importance in the ordering of topics besides giving the optimal distribution of practice to each ability. Such are considerations of interest, of welding separate abilities into an integrated total ability, and of the limitations due to the school schedule with its Saturdays, Sundays, holidays, and vacations.

Improvement can, however, be made over present practice in many respects. A scientific examination of the teaching of almost any class for a year, or of many of our standard instruments of instruction, will reveal opportunities for improving the distribution of practice with no sacrifice of interest, and with an actual gain in integrated functioning arithmetical power. In particular it will reveal cases where an ability is given practice and then, never being used again, left to die of inactivity. It will reveal cases where an ability is given practice and then left so long without practice that the first effect is nearly lost. There will be cases where practice is given and reviews are given, but all in such isolation from everything else in arithmetic that the ability, though existent, does not become a part of the pupil's general working equipment. There will be cases where more practice is given in the late than the earlier periods for no apparent extrinsic advantage; and cases where the practice is put where it is for no reason that is observable save that the teacher or author in question has decided to have some drill work at that time!

Each ability has its peculiar needs in this matter, and no set rules are at present of much value. It will be enough for the present if we are aroused to the problem of distribution, avoid obvious follies like those just noted, and exercise what ingenuity we have.

CHAPTER IX

THE PSYCHOLOGY OF THINKING: ABSTRACT IDEAS AND GENERAL NOTIONS IN ARITHMETIC^[11]

RESPONSES TO ELEMENTS AND CLASSES

The plate which you see, the egg before you at the breakfast table, and this page are concrete things, but whiteness, whether of plate, egg, or paper, is, we say, an abstract quality. To be able to think of whiteness irrespective of any concrete white object is to be able to have an abstract idea or notion of white; to be able to respond to whiteness, irrespective of whether it is a part of china, eggshell, paper or whatever object, is to be able to respond to the abstract element of whiteness.

Learning arithmetic involves the formation of very many such ideas, the acquisition of very many such powers of response to elements regardless of the gross total situations in which they appear. To appreciate the fiveness of five boys, five pencils, five inches, five rings of a bell; to understand the division into eight equal parts of 40 cents, 32 feet, 64 minutes, or 16 ones; to respond correctly to the fraction relation in $\frac{2}{3}$, $\frac{5}{6}$, $\frac{3}{4}$, $\frac{7}{12}$, $\frac{1}{8}$, or any other; to be sensitive to the common element of $9 = 3 \times 3$, $16 = 4 \times 4$, $625 = 25 \times 25$, $.04 = .2 \times .2$, $\frac{1}{4} = \frac{1}{2} \times \frac{1}{2}$,—these are obvious illustrations. All the numbers which the pupil learns to understand and manipulate are in fact abstractions; all the operations are abstractions; percent, discount, interest, height, length, area, volume, are abstractions; sum, difference, product, quotient, remainder, average, are facts that concern elements or aspects which may appear with countless different concrete surroundings or concomitants.

Towser is a particular dog; your house lot on Elm Street is a particular rectangle; Mr. and Mrs. I.S. Peterson and their daughter Louise are a particular family of three. In contrast to these particulars, we mean by a dog, a rectangle, and a family of three, *any* specimens of these classes of facts. The idea of a dog, of rectangles in general, of any family of three is a general notion, a concept or idea of a class or species. The ability to respond to any dog, or rectangle, or family of three, regardless of which particular one it may be, is the general notion in action.

Learning arithmetic involves the formation of very many such general notions, such powers of response to any member of a certain class. Thus a hundred different sized lots may all be responded to as rectangles; $\frac{9}{18}$, $\frac{12}{27}$, $\frac{15}{24}$, and $\frac{27}{36}$ may all be responded to as members of the class, 'both members divisible by 3.' The same fact may be responded to in different ways according to the class to which it is assigned. Thus 4 in $\frac{3}{4}$, $\frac{4}{5}$, 45, 54, and 405 is classed respectively as 'a certain sized part of unity,' 'a certain number of parts of the size shown by the 5,' 'a certain number of tens,' 'a certain number of ones,' and 'a certain number of hundreds.' Each abstract quality may become the basis of a class of facts. So fourness as a quality corresponds to the class 'things four in number or size'; the fractional quality or relation corresponds to the class 'fractions.' The bonds formed with classes of facts and with elements or features by which one whole class of facts is distinguished from another, are in fact, a chief concern of arithmetical learning.^[12]

FACILITATING THE ANALYSIS OF ELEMENTS

Abstractions and generalizations then depend upon analysis and upon bonds formed with more or less subtle elements rather than with gross total concrete situations. The process involved is most easily understood by considering the means employed to facilitate it.

The first of these is having the learner respond to the total situations containing the element in question with the attitude of piecemeal examination, and with attentiveness to one element after another, especially to so near an approximation to the element in question as he can already select for attentive examination. This attentiveness to one element after

another serves to emphasize whatever appropriate minor bonds from the element in question the learner already possesses. Thus, in teaching children to respond to the 'fiveness' of various collections, we show five boys or five girls or five pencils, and say, "See how many boys are standing up. Is Jack the only boy that is standing here? Are there more than two boys standing? Name the boys while I point at them and count them. (Jack) is one, and (Fred) is one more, and (Henry) is one more. Jack and Fred make (two) boys. Jack and Fred and Henry make (three) boys." (And so on with the attentive counting.) The mental set or attitude is directed toward favoring the partial and predominant activity of 'how-many-ness' as far as may be; and the useful bonds that the 'fiveness,' the 'one and one and one and one and one-ness,' already have, are emphasized as far as may be.

The second of the means used to facilitate analysis is having the learner respond to many situations each containing the element in question (call it A), but with varying concomitants (call these V. C.) his response being so directed as, so far as may be, to separate each total response into an element bound to the A and an element bound to the V. C.

Thus the child is led to associate the responses—'Five boys,' 'Five girls,' 'Five pencils,' 'Five inches,' 'Five feet,' 'Five books,' 'He walked five steps,' 'I hit my desk five times,' and the like—each with its appropriate situation. The 'Five' element of the response is thus bound over and over again to the 'fiveness' element of the situation, the mental set being 'How many?,' but is bound only once to any one of the concomitants. These concomitants are also such as have preferred minor bonds of their own (the sight of a row of boys *per se* tends strongly to call up the 'Boys' element of the response). The other elements of the responses (boys, girls, pencils, etc.) have each only a slight connection with the 'fiveness' element of the situations. These slight connections also in large part^[13] counteract each other, leaving the field clear for whatever uninhibited bond the 'fiveness' has.

The third means used to facilitate analysis is having the learner respond to situations which, pair by pair, present the element in a certain context and present that same context with *the opposite of the element in question*, or with something at least very unlike the element. Thus, a child who is being taught to respond to 'one fifth' is not only led to respond to 'one fifth of a cake,' 'one fifth of a pie,' 'one fifth of an apple,' 'one fifth of ten inches,' 'one

fifth of an army of twenty soldiers,' and the like; he is also led to respond to each of these *in contrast with* 'five cakes,' 'five pies,' 'five apples,' 'five times ten inches,' 'five armies of twenty soldiers.' Similarly the 'place values' of tenths, hundredths, and the rest are taught by contrast with the tens, hundreds, and thousands.

These means utilize the laws of connection-forming to disengage a response element from gross total responses and attach it to some situation element. The forces of use, disuse, satisfaction, and discomfort are so maneuvered that an element which never exists by itself in nature can influence man almost as if it did so exist, bonds being formed with it that act almost or quite irrespective of the gross total situation in which it inheres. What happens can be most conveniently put in a general statement by using symbols.

Denote by $a + b$, $a + g$, $a + l$, $a + q$, $a + v$, and $a + B$ certain situations alike in the element a and different in all else. Suppose that, by original nature or training, a child responds to these situations respectively by $r_1 + r_2$, $r_1 + r_7$, $r_1 + r_{12}$, $r_1 + r_{17}$, $r_1 + r_{22}$, $r_1 + r_{27}$. Suppose that man's neurones are capable of such action that r_1 , r_2 , r_7 , r_{12} , r_{22} , and r_{27} , can each be made singly.

Case I. Varying Concomitants

Suppose that $a + b$, $a + g$, $a + l$, etc., occur once each.

We have	$a + b$	responded to by	$r_1 + r_2$,
	$a + g$	" "	$r_1 + r_7$,
	$a + l$	" "	$r_1 + r_{12}$,
	$a + q$	" "	$r_1 + r_{17}$,
	$a + v$	" "	$r_1 + r_{22}$, and
	$a + B$	" "	$r_1 + r_{27}$, as shown in Scheme I.

Scheme I

	<i>a</i>	<i>b</i>	<i>g</i>	<i>l</i>	<i>q</i>	<i>v</i>	<i>B</i>
<i>r</i> ₁	6	1	1	1	1	1	1
<i>r</i> ₂	1	1					
<i>r</i> ₇	1		1				
<i>r</i> ₁₂	1			1			
<i>r</i> ₁₇	1				1		
<i>r</i> ₂₂	1					1	
<i>r</i> ₂₇	1						1

a is thus responded to by *r*₁ (that is, connected with *r*₁) each time, or six in all, but only once each with *b*, *g*, *l*, *q*, *v*, and *B*. *b*, *g*, *l*, *q*, *v*, and *B* are connected once each with *r*₁ and once respectively with *r*₂, *r*₇, *r*₁₂, etc. The bond from *a* to *r*₁, has had six times as much exercise as the bond from *a* to *r*₂, or from *a* to *r*₇, etc. In any new gross situation, *a* 0, *a* will be more predominant in determining response than it would otherwise have been; and *r*₁ will be more likely to be made than *r*₂, *r*₇, *r*₁₂, etc., the other previous associates in the response to a situation containing *a*. That is, the bond from the element *a* to the response *r*₁ has been notably strengthened.

Case II. Contrasting Concomitants

Now suppose that *b* and *g* are very dissimilar elements (e.g., white and black), that *l* and *q* are very dissimilar (e.g., long and short), and that *v* and *B* are also very dissimilar. To be very dissimilar means to be responded to very differently, so that *r*₇, the response to *g*, will be very unlike *r*₂, the response to *b*. So *r*₇ may be thought of as *r*_{not 2} or *r*₋₂. In the same way *r*₁₂ may be thought of as *r*_{not 12} or *r*₋₁₂, and *r*₂₇ may be called *r*_{not 22} or *r*₋₂₂.

Then, if the situations *a b*, *a g*, *a l*, *a q*, *a v*, and *a B* are responded to, each once, we have:—

<i>a + b</i>	responded to by	<i>r</i> ₁ + <i>r</i> ₂ ,
<i>a + g</i>	" "	<i>r</i> ₁ + <i>r</i> _{not 2} ,
<i>a + l</i>	" "	

			$r_1 + r_{12}$,
$a + q$	"	"	$r_1 + r_{\text{not } 12}$,
$a + v$	"	"	$r_1 + r_{22}$, and
$a + B$	"	"	$r_1 + r_{\text{not } 22}$, as shown in Scheme II.

Scheme II

	a	b	g (opp. of b)	l	q (opp. of l)	v	B (opp. of v)
r_1	6	1	1	1	1	1	1
$r_{\text{not } 1}$							
r_2	1	1					
$r_{\text{not } 2}$	1		1				
r_{12}	1			1			
$r_{\text{not } 12}$	1				1		
r_{22}	1					1	
$r_{\text{not } 22}$	1						1

r_1 is connected to a by 6 repetitions. r_2 and $r_{\text{not } 2}$ are each connected to a by 1 repetition, but since they interfere, canceling each other so to speak, the net result is for a to have zero tendency to call up r_2 or $r_{\text{not } 2}$. r_{12} and $r_{\text{not } 12}$ are each connected to a by 1 repetition, but they interfere with or cancel each other with the net result that a has zero tendency to call up r_{12} or $r_{\text{not } 12}$. So with r_{22} and $r_{\text{not } 22}$. Here then the net result of the six connections of a to b , a to g , a to l , a to q , a to v , and a to B is to connect a with r , and with nothing else.

Case III. Contrasting Concomitants and Contrasting Element

Suppose now that the facts are as in Case II, but with the addition of six experiences where a certain element which is the opposite of, or very dissimilar to, a is connected with the response $r_{\text{not } 1}$, or r_{-1} which is opposite to, or very dissimilar to r_1 . Call this opposite of a , $-a$.

That is, we have not only

$a + b$	responded to by	$r_1 + r_2,$
$a + g$	" "	$r_1 + r_{\text{not } 2},$
$a + l$	" "	$r_1 + r_{12},$
$a + q$	" "	$r_1 + r_{\text{not } 12},$
$a + v$	" "	$r_1 + r_{22},$ and
$a + B$	" "	$r_1 + r_{\text{not } 22},$

but also

$-a + b$	responded to by	$r_{\text{not } 1} + r_2,$
$-a + g$	" "	$r_{\text{not } 1} + r_{\text{not } 2},$
$-a + l$	" "	$r_{\text{not } 1} + r_{12},$
$-a + q$	" "	$r_{\text{not } 1} + r_{\text{not } 12},$
$-a + v$	" "	$r_{\text{not } 1} + r_{22},$ and
$-a + B$	" "	$r_{\text{not } 1} + r_{\text{not } 22},$ as shown in Scheme III.

Scheme III

	a	<i>opp.</i> <i>of a</i>	b	g	l	q	v	B
			(<i>opp.</i> of b)		(<i>opp.</i> of l)		(<i>opp.</i> of v)	
r_1	6		1	1	1	1	1	1
$r_{\text{not } 1}$		6	1	1	1	1	1	1
r_2	1	1	2					
$r_{\text{not } 2}$	1	1		2				
r_{12}	1	1			2			
$r_{\text{not } 12}$	1	1				2		
r_{22}	1	1					2	
$r_{\text{not } 22}$	1	1						2

In this series of twelve experiences a connects with r_1 six times and the opposite of a connects with $r_{\text{not } 1}$ six times. a connects equally often with three pairs of mutual destructives r_2 and $r_{\text{not } 2}$, r_{12} and $r_{\text{not } 12}$, r_{22} and $r_{\text{not } 22}$,

and so has zero tendency to call them up. — a has also zero tendency to call up any of these responses except its opposite, $r_{\text{not } 1}$. $b, g, l, q, v,$ and B are made to connect equally often with r_1 and $r_{\text{not } 1}$. So, of these elements, a is the only one left with a tendency to call up r_1 .

Thus, by the mere action of frequency of connection, r_1 is connected with a ; the bonds from a to anything except r_1 are being counteracted, and the slight bonds from anything except a to r_1 are being counteracted. The element a becomes predominant in situations containing it; and its bond toward r_1 becomes relatively enormously strengthened and freed from competition.

These three processes occur in a similar, but more complicated, form if the situations $a + b, a + g,$ etc., are replaced by $a + b + c + d + e + f, a + g + h + i + j + k,$ etc., and the responses $r_1 + r_2, r_1 + r_7, r_1 + r_{12},$ etc., are replaced by $r_1 + r_2 + r_3 + r_4 + r_5 + r_6, r_1 + r_7 + r_8 + r_9 + r_{10} + r_{11},$ etc.—*provided the $r_1, r_2, r_3, r_4,$ etc., can be made singly*. In so far as any one of the responses is necessarily co-active with any one of the others (so that, for example, r_{13} always brings r_{26} with it and *vice versa*), the exact relations of the numbers recorded in schemes like schemes I, II, and III on pages 172 to 174 will change; but, unless r_1 has such an inevitable co-actor, the general results of schemes I, II, and III will hold good. If r_1 does have such an inseparable co-actor, say r_2 , then, of course, a can never acquire bonds with r_1 alone, but everywhere that r_1 or r_2 appears in the preceding schemes the other element must appear also. $r_1 r_2$ would then have to be used as a unit in analysis.

The ' $a + b,$ ' ' $a + g,$ ' ' $a + l,$ ' ... ' $a + B$ ' situations may occur unequal numbers of times, altering the exact numerical relations of the connections formed and presented in schemes I, II, and III; but the process in general remains the same.

So much for the effect of use and disuse in attaching appropriate response elements to certain subtle elements of situations. There are three main series of effects of satisfaction and discomfort. They serve, first, to emphasize, from the start, the desired bonds leading to the responses $r_1 + r_2, r_1 + r_7,$ etc., to the total situations, and to weed out the undesirable ones. They also act to

emphasize, in such comparisons and contrasts as have been described, every action of the bond from a to r_1 ; and to eliminate every tendency of a to connect with aught save r_1 , and of aught save a to connect with r_1 . Their third service is to strengthen the bonds produced of appropriate responses to a wherever it occurs, whether or not any formal comparisons and contrasts take place.

The process of learning to respond to the difference of pitch in tones from whatever instrument, to the 'square-root-ness' of whatever number, to triangularity in whatever size or combination of lines, to equality of whatever pairs, or to honesty in whatever person or instance, is thus a consequence of associative learning, requiring no other forces than those of use, disuse, satisfaction, and discomfort. "What happens in such cases is that the response, by being connected with many situations alike in the presence of the element in question and different in other respects, is bound firmly to that element and loosely to each of its concomitants. Conversely any element is bound firmly to any one response that is made to all situations containing it and very, very loosely to each of those responses that are made to only a few of the situations containing it. The element of triangularity, for example, is bound firmly to the response of saying or thinking 'triangle' but only very loosely to the response of saying or thinking white, red, blue, large, small, iron, steel, wood, paper, and the like. A situation thus acquires bonds not only with some response to it as a gross total, but also with responses to any of its elements that have appeared in any other gross totals. Appropriate response to an element regardless of its concomitants is a necessary consequence of the laws of exercise and effect if an animal learns to make that response to the gross total situations that contain the element and not to make it to those that do not. Such prepotent determination of the response by one or another element of the situation is no transcendental mystery, but, given the circumstances, a general rule of all learning." Such are at bottom only extreme cases of the same learning as a cat exhibits that depresses a platform in a certain box whether it faces north or south, whether the temperature is 50 or 80 degrees, whether one or two persons are in sight, whether she is exceedingly or moderately hungry, whether fish or milk is outside the box. All learning is analytic, representing the activity of elements within a total situation. In man, by virtue of certain instincts and the course of his training, very subtle elements of situations can so operate.

Learning by analysis does not often proceed in the carefully organized way represented by the most ingenious marshaling of comparing and contrasting activities. The associations with gross totals, whereby in the end an element is elevated to independent power to determine response, may come in a haphazard order over a long interval of time. Thus a gifted three-year-old boy will have the response element of 'saying or thinking *two*,' bound to the 'two-ness' element of very many situations in connection with the 'how-many' mental set; and he will have made this analysis without any formal, systematic training. An imperfect and inadequate analysis already made is indeed usually the starting point for whatever systematic abstraction the schools direct. Thus the kindergarten exercises in analyzing out number, color, size, and shape commonly assume that 'one-ness' *versus* 'more-than-one-ness,' black and white, big and little, round and not round are, at least vaguely, active as elements responded to in some independence of their contexts. Moreover, the tests of actual trial and success in further undirected exercises usually cooperate to confirm and extend and refine what the systematic drills have given. Thus the ordinary child in school is left, by the drills on decimal notation, with only imperfect power of response to the 'place-values.' He continues to learn to respond properly to them by finding that $4 \times 40 = 160$, $4 \times 400 = 1600$, $800 - 80 = 720$, $800 - 8 = 792$, $800 - 800 = 0$, $42 \times 48 = 2016$, $24 \times 48 = 1152$, and the like, are satisfying; while $4 \times 40 = 16$, $23 \times 48 = 832$, $800 - 8 = 0$, and the like, are not. The process of analysis is the same in such casual, unsystematized formation of connections with elements as in the deliberately managed, piecemeal inspection, comparison, and contrast described above.

SYSTEMATIC AND OPPORTUNISTIC STIMULI TO ANALYSIS

The arrangement of a pupil's experiences so as to direct his attention to an element, vary its concomitants instructively, stimulate comparison, and throw the element into relief by contrast may be by fixed, formal, systematic exercises. Or it may be by much less formal exercises, spread over a longer time, and done more or less incidentally in other connections. We may call these two extremes the 'systematic' and 'opportunistic,' since the chief feature

of the former is that it systematically provides experiences designed to build up the power of correct response to the element, whereas the chief feature of the latter is that it uses especially such opportunities as occur by reason of the pupil's activities and interests.

Each method has its advantages and disadvantages. The systematic method chooses experiences that are specially designed to stimulate the analysis; it provides these at a certain fixed time so that they may work together; it can then and there test the pupils to ascertain whether they really have the power to respond to the element or aspect or feature in question. Its disadvantages are, first, that many of the pupils will feel no need for and attach no interest or motive to these formal exercises; second, that some of the pupils may memorize the answers as a verbal task instead of acquiring insight into the facts; third, that the ability to respond to the element may remain restricted to the special cases devised for the systematic training, and not be available for the genuine uses of arithmetic.

The opportunistic method is strong just where the systematic is weak. Since it seizes upon opportunities created by the pupil's abilities and interests, it has the attitude of interest more often. Since it builds up the experiences less formally and over a wider space of time, the pupils are less likely to learn verbal answers. Since its material comes more from the genuine uses of life, the power acquired is more likely to be applicable to life.

Its disadvantage is that it is harder to manage. More thought and experimentation are required to find the best experiences; greater care is required to keep track of the development of an abstraction which is taught not in two days, but over two months; and one may forget to test the pupils at the end. In so far as the textbook and teacher are able to overcome these disadvantages by ingenuity and care, the opportunistic method is better.

ADAPTATIONS TO ELEMENTARY SCHOOL PUPILS

We may expect much improvement in the formation of abstract and general ideas in arithmetic from the application of three principles in addition to those already described. They are: (1) Provide enough actual experiences before asking the pupil to understand and use an abstract or

general idea. (2) Develop such ideas gradually, not attempting to give complete and perfect ideas all at once. (3) Develop such ideas so far as possible from experiences which will be valuable to the pupil in and of themselves, quite apart from their merit as aids in developing the abstraction or general notion. Consider these three principles in order.

Children, especially the less gifted intellectually, need more experiences as a basis for and as applications of an arithmetical abstraction or concept than are usually given them. For example, in paving the way for the principle, "Any number times 0 equals 0," it is not safe to say, "John worked 8 days for 0 minutes per day. How many minutes did he work?" and "How much is 0 times 4 cents?" It will be much better to spend ten or fifteen minutes as follows:^[14] "What does zero mean? (Not any. No.) How many feet are there in eight yards? In 5 yards? In 3 yards? In 2 yards? In 1 yard? In 0 yard? How many inches are there in 4 ft.? In 2 ft.? In 0 ft.? 7 pk. = qt. 5 pk. = qt. 0 pk. = qt. A boy receives 60 cents an hour when he works. How much does he receive when he works 3 hr.? 8 hr.? 6 hr.? 0 hr.? A boy received 60 cents a day for 0 days. How much did he receive? How much is 0 times \$600? How much is 0 times \$5000? How much is 0 times a million dollars? 0 times any number equals...."

232 (At the blackboard.) 0 time 232 equals what?

30 I write 0 under the 0.^[15] 3 times 232 equals what?

6960 Continue at the blackboard with

734	321	312	41	
20	40	30	60	etc."
_____	_____	_____	_____	

Pupils in the elementary school, except the most gifted, should not be expected to gain mastery over such concepts as *common fraction*, *decimal fraction*, *factor*, and *root* quickly. They can learn a definition quickly and learn to use it in very easy cases, where even a vague and imperfect understanding of it will guide response correctly. But complete and exact understanding commonly requires them to take, not one intellectual step, but many; and mastery in use commonly comes only as a slow growth. For example, suppose that pupils are taught that .1, .2, .3, etc., mean $\frac{1}{10}$, $\frac{2}{10}$,

$\frac{3}{10}$, etc., that .01, .02, .03, etc., mean $\frac{1}{100}$, $\frac{2}{100}$, $\frac{3}{100}$, etc., that .001, .002, .003, etc., mean $\frac{1}{1000}$, $\frac{2}{1000}$, $\frac{3}{1000}$, etc., and that .1, .02, .001, etc., are decimal fractions. They may then respond correctly when asked to write a decimal fraction, or to state which of these,— $\frac{1}{4}$, .4, $\frac{3}{8}$, .07, .002, $\frac{5}{6}$,—are common fractions and which are decimal fractions. They may be able, though by no means all of them will be, to write decimal fractions which equal $\frac{1}{2}$ and $\frac{1}{5}$, and the common fractions which equal .1 and .09. Most of them will not, however, be able to respond correctly to "Write a decimal mixed number"; or to state which of these,— $\frac{1}{100}$, $4\frac{1}{2}$, $\frac{.007}{350}$, \$.25,—are common fractions, and which are decimals; or to write the decimal fractions which equal $\frac{3}{4}$ and $\frac{1}{3}$.

If now the teacher had given all at once the additional experiences needed to provide the ability to handle these more intricate and subtle features of decimal-fraction-ness, the result would have been confusion for most pupils. The general meaning of .32, .14, .99, and the like requires some understanding of .30, .10, .90, and .02, .04, .08; but it is not desirable to disturb the child with .30 while he is trying to master 2.3, 4.3, 6.3, and the like. Decimals in general require connection with place value and the contrasts of .41 with 41, 410, 4.1, and the like, but if the relation to place values in general is taught in the same lesson with the relation to $\frac{1}{10}$ s, $\frac{1}{100}$ s, $\frac{1}{1000}$ s, the mind will suffer from violent indigestion.

A wise pedagogy in fact will break up the process of learning the meaning and use of decimal fractions into many teaching units, for example, as follows:—

(1) Such familiarity with fractions with large denominators as is desirable for pupils to have, as by an exercise in reducing to lowest terms, $\frac{8}{10}$, $\frac{36}{64}$, $\frac{20}{25}$, $\frac{18}{24}$, $\frac{24}{32}$, $\frac{21}{30}$, $\frac{25}{100}$, $\frac{40}{100}$, and the like. This is good as a review of cancellation, and as an extension of the idea of a fraction.

(2) Objective work, showing $\frac{1}{10}$ sq. ft., $\frac{1}{50}$ sq. ft., $\frac{1}{100}$ sq. ft., and $\frac{1}{1000}$ sq. ft., and having these identified and the forms $\frac{1}{10}$ sq. ft., $\frac{1}{100}$ sq. ft., and $\frac{1}{1000}$ sq. ft. learned. Finding how many feet = $\frac{1}{10}$ mile and $\frac{1}{100}$ mile.

(3) Familiarity with $\frac{1}{100}$ s and $\frac{1}{1000}$ s by reductions of $\frac{750}{1000}$, $\frac{50}{100}$, etc., to lowest terms and by writing the missing numerators in $\frac{500}{1000} = \frac{1}{100} = \frac{1}{10}$ and the like, and by finding $\frac{1}{10}$, $\frac{1}{100}$, and $\frac{1}{1000}$ of 3000, 6000, 9000, etc.

(4) Writing $\frac{1}{10}$ as .1 and $\frac{1}{100}$ as .01, $\frac{11}{100}$, $\frac{12}{100}$, $\frac{13}{100}$, etc., as .11, .12, .13. United States money is used as the introduction. Application is made to miles.

(5) Mixed numbers with a first decimal place. The cyclometer or speedometer. Adding numbers like 9.1, 14.7, 11.4, etc.

(6) Place value in general from thousands to hundredths.

(7) Review of (1) to (6).

(8) Tenths and hundredths of a mile, subtraction when both numbers extend to hundredths, using a railroad table of distances.

(9) Thousandths. The names 'decimal fractions or decimals,' and 'decimal mixed numbers or decimals.' Drill in reading any number to thousandths. The work will continue with gradual extension and refinement of the understanding of decimals by learning how to operate with them in various ways.

Such may seem a slow progress, but in fact it is not, and many of these exercises whereby the pupil acquires his mastery of decimals are useful as organizations and applications of other arithmetical facts.

That, it will be remembered, was the third principle:—"Develop abstract and general ideas by experiences which will be intrinsically valuable." The reason is that, even with the best of teaching, some pupils will not, within any reasonable limits of time expended, acquire ideas that are fully complete, rigorous when they should be, flexible when they should be, and absolutely exact. Many children (and adults, for that matter) could not within any reasonable limits of time be so taught the nature of a fraction that they could decide unerringly in original exercises like:—

Is $2.\frac{75}{25}$ a common fraction?

Is \$.25 a decimal fraction?

Is one x th of y a fraction?

Can the same words mean both a common fraction and a decimal fraction?

Express 1 as a common fraction.

Express 1 as a decimal fraction.

These same children can, however, be taught to operate correctly with fractions in the ordinary uses thereof. And that is the chief value of arithmetic to them. They should not be deprived of it because they cannot master its subtler principles. So we seek to provide experiences that will teach all pupils something of value, while stimulating in those who have the ability the growth of abstract ideas and general principles.

Finally, we should bear in mind that working with qualities and relations that are only partly understood or even misunderstood does under certain conditions give control over them. The general process of analytic learning in life is to respond as well as one can; to get a clearer idea thereby; to respond better the next time; and so on. For instance, one gets some sort of notion of what $\frac{1}{5}$ means; he then answers such questions as $\frac{1}{5}$ of 10 = ? $\frac{1}{5}$ of 5 = ? $\frac{1}{5}$ of 20 = ?; by being told when he is right and when he is wrong, he gets from these experiences a better idea of $\frac{1}{5}$; again he does his best with $\frac{1}{5} = \frac{2}{10}$, $\frac{1}{5} = \frac{2}{15}$, etc., and as before refines and enlarges his concept of $\frac{1}{5}$. He adds $\frac{1}{5}$ to $\frac{2}{5}$, etc., $\frac{1}{5}$ to $\frac{3}{10}$, etc., $\frac{1}{5}$ to $\frac{1}{2}$, etc., and thereby gains still further, and so on.

What begins as a blind habit of manipulation started by imitation may thus grow into the power of correct response to the essential element. The pupil who has at the start no notion at all of 'multiplying' may learn what multiplying is by his experience that '4 6 multiplying gives 24'; '3 9 multiplying gives 27,' etc. If the pupil keeps on doing something with numbers and differentiates right results, he will often reach in the end the abstractions which he is supposed to need in the beginning. It may even be the case with some of the abstractions required in arithmetic that elaborate provision for comprehension beforehand is not so efficient as the same amount of energy devoted partly to provision for analysis itself beforehand

and partly to practice in response to the element in question without full comprehension.

It certainly is not the best psychology and not the best educational theory to think that the pupil first masters a principle and then merely applies it—first does some thinking and then computes by mere routine. On the contrary, the applications should help to establish, extend, and refine the principle—the work a pupil does with numbers should be a main means of increasing his understanding of the principles of arithmetic as a science.

CHAPTER X

THE PSYCHOLOGY OF THINKING: REASONING IN ARITHMETIC

THE ESSENTIALS OF ARITHMETICAL REASONING

We distinguish aimless reverie, as when a child dreams of a vacation trip, from purposive thinking, as when he tries to work out the answer to "How many weeks of vacation can a family have for \$120 if the cost is \$22 a week for board, \$2.25 a week for laundry, and \$1.75 a week for incidental expenses, and if the railroad fares for the round trip are \$12?" We distinguish the process of response to familiar situations, such as five integral numbers to be added, from the process of response to novel situations, such as (for a child who has not been trained with similar problems):—"A man has four pieces of wire. The lengths are 120 yd., 132 meters, 160 feet, and $\frac{1}{8}$ mile. How much more does he need to have 1000 yd. in all?" We distinguish 'thinking things together,' as when a diagram or problem or proof is understood, from thinking of one thing after another as when a number of words are spelled or a poem in an unknown tongue is learned. In proportion as thinking is purposive, with selection from the ideas that come up, and in proportion as it deals with novel problems for which no ready-made habitual response is available, and in proportion as many bonds act together in an organized way to produce response, we call it reasoning.

When the conclusion is reached as the effect of many particular experiences, the reasoning is called inductive. When some principle already established leads to another principle or to a conclusion about some particular fact, the reasoning is called deductive. In both cases the process involves the analysis of facts into their elements, the selection of the elements that are deemed significant for the question at hand, the attachment

of a certain amount of importance or weight to each of them, and their use in the right relations. Thought may fail because it has not suitable facts, or does not select from them the right ones, or does not attach the right amount of weight to each, or does not put them together properly.

In the world at large, many of our failures in thinking are due to not having suitable facts. Some of my readers, for example, cannot solve the problem—"What are the chances that in drawing a card from an ordinary pack of playing-cards four times in succession, the same card will be drawn each time?" And it will be probably because they do not know certain facts about the theory of probabilities. The good thinkers among such would look the matter up in a suitable book. Similarly, if a person did not happen to know that there were fifty-two cards in all and that no two were alike, he could not reason out the answer, no matter what his mastery of the theory of probabilities. If a competent thinker, he would first ask about the size and nature of the pack. In the actual practice of reasoning, that is, we have to survey our facts to see if we lack any that are necessary. If we do, the first task of reasoning is to acquire those facts.

This is specially true of the reasoning about arithmetical facts in life. "Will $3\frac{1}{2}$ yards of this be enough for a dress?" Reason directs you to learn how wide it is, what style of dress you intend to make of it, how much material that style normally calls for, whether you are a careful or a wasteful cutter, and how big the person is for whom the dress is to be made. "How much cheaper as a diet is bread alone, than bread with butter added to the extent of 10% of the weight of the bread?" Reason directs you to learn the cost of bread, the cost of butter, the nutritive value of bread, and the nutritive value of butter.

In the arithmetic of the school this feature of reasoning appears in cases where some fact about common measures must be brought to bear, or some table of prices or discounts must be consulted, or some business custom must be remembered or looked up.

Thus "How many badges, each 9 inches long, can be made from $2\frac{1}{2}$ yd. ribbon?" cannot be solved without getting into mind $1 \text{ yd.} = 36 \text{ inches}$. "At Jones' prices, which costs more, $3\frac{3}{4}$ lb. butter or $6\frac{1}{2}$ lb. lard? How much more?" is a problem which directs the thinker to ascertain Jones' prices.

It may be noted that such problems are, other things being equal, somewhat better training in thinking than problems where all the data are given in the problem itself (*e.g.*, "Which costs more, $3\frac{3}{4}$ lb. butter at 48¢ per lb. or $6\frac{1}{2}$ lb. lard at 27¢ per lb.? How much more?"). At least it is unwise to have so many problems of the latter sort that the pupil may come to think of a problem in applied arithmetic as a problem where everything is given and he has only to manipulate the data. Life does not present its problems so.

The process of selecting the right elements and attaching proper weight to them may be illustrated by the following problem:—"Which of these offers would you take, supposing that you wish a D.C.K. upright piano, have \$50 saved, can save a little over \$20 per month, and can borrow from your father at 6% interest?"

A

A Reliable Piano. The Famous D.C.K. Upright. You pay \$50 cash down and \$21 a month for only a year and a half. *No interest* to pay. We ask you to pay only for the piano and allow you plenty of time.

B

We offer the well-known D.C.K. Piano for \$390. \$50 cash and \$20 a month thereafter. Regular interest at 6%. The interest soon is reduced to less than \$1 a month.

C

The D.C.K. Piano. Special Offer, \$375, cash. Compare our prices with those of any reliable firm.

If you consider chiefly the "only," "No interest to pay," "only," and "plenty of time" in offer A, attaching much weight to them and little to the thought, "How much will \$50 plus $(18 \times \$21)$ be?", you will probably decide wrongly.

The situations of life are often complicated by many elements of little or even of no relevance to the correct solution. The offerer of A may belong to your church; your dearest friend may urge you to accept offer B; you may dislike to talk with the dealer who makes offer C; you may have a prejudice against owing money to a relative; that prejudice may be wise or foolish; you may have a suspicion that the B piano is shopworn; that suspicion may be well-founded or groundless; the salesman for C says, "You don't want your friends to say that you bought on the installment plan. Only low-class persons do that," etc. The statement of arithmetical problems in school usually assists the pupil to the extent of ruling out all save definitely quantitative elements, and of ruling out all quantitative elements except those which should be considered. The first of the two simplifications is very beneficial, on the whole, since otherwise there might be different correct solutions to a problem according to the nature and circumstances of the persons involved. The second simplification is often desirable, since it will often produce greater improvement in the pupils, per hour of time spent, than would be produced by the problems requiring more selection. It should not, however, be a universal custom; for in that case the pupils are tempted to think that in every problem they must use all the quantities given, as one must use all the pieces in a puzzle picture.

It is obvious that the elements selected must not only be right but also be in the right relations to one another. For example, in the problems below, the 6 must be thought of in relation to a dozen and as being half of a dozen, and also as being 6 times 1. 1 must be mentally tied to "each." The 6 as half of a dozen must be related to the \$1.00, \$1.60, etc. The 6 as 6 times 1 must be related to the \$.09, \$.14, etc.

Buying in Quantity

These are a grocer's prices for certain things by the dozen and for a single one. He sells a half dozen at half the price of a dozen. Find out how much you save by buying 6 all at one time instead of buying them one at a time.

	Doz.	Each
1. Evaporated Milk	\$1.00	\$.09
2. Puffed Rice	1.60	.14
3. Puffed Wheat	1.10	.10
4. Canned Soup	1.90	.17
5. Sardines	1.80	.16
6. Beans (No. 2 cans)	1.50	.13
7. Pork and Beans	1.70	.15
8. Peas (No. 2 cans)	1.40	.12
9. Tomatoes (extra cans)	3.20	.28
10. Ripe olives (qt. cans)	7.20	.65

It is obvious also that in such arithmetical work as we have been describing, the pupil, to be successful, must 'think things together.' Many bonds must coöperate to determine his final response.

As a preface to reasoning about a problem we often have the discovery of the problem and the classification of just what it is, and as a postscript we have the critical inspection of the answer obtained to make sure that it is verified by experiment or is consistent with known facts. During the process of searching for, selecting, and weighting facts, there may be similar inspection and validation, item by item.

REASONING AS THE COÖPERATION OF ORGANIZED HABITS

The pedagogy of the past made two notable errors in practice based on two errors about the psychology of reasoning. It considered reasoning as a somewhat magical power or essence which acted to counteract and overrule the ordinary laws of habit in man; and it separated too sharply the 'understanding of principles' by reasoning from the 'mechanical' work of computation, reading problems, remembering facts and the like, done by 'mere' habit and memory.

Reasoning or selective, inferential thinking is not at all opposed to, or independent of, the laws of habit, but really is their necessary result under the conditions imposed by man's nature and training. A closer examination of selective thinking will show that no principles beyond the laws of readiness, exercise, and effect are needed to explain it; that it is only an extreme case of what goes on in associative learning as described under the 'piecemeal' activity of situations; and that attributing certain features of learning to mysterious faculties of abstraction or reasoning gives no real help toward understanding or controlling them.

It is true that man's behavior in meeting novel problems goes beyond, or even against, the habits represented by bonds leading from gross total situations and customarily abstracted elements thereof. One of the two reasons therefor, however, is simply that the finer, subtle, preferential bonds with subtler and less often abstracted elements go beyond, and at times against, the grosser and more usual bonds. One set is as much due to exercise and effect as the other. The other reason is that in meeting novel problems the mental set or attitude is likely to be one which rejects one after another response as their unfitness to satisfy a certain desideratum appears. What remains as the apparent course of thought includes only a few of the many bonds which did operate, but which, for the most part, were unsatisfying to the ruling attitude or adjustment.

Successful responses to novel data, associations by similarity and purposive behavior are in only apparent opposition to the fundamental laws of associative learning. Really they are beautiful examples of it. Man's successful responses to novel data—as when he argues that the diagonal on a right triangle of 796.278 mm. base and 137.294 mm. altitude will be 808.022 mm., or that Mary Jones, born this morning, will sometime die—are due to habits, notably the habits of response to certain elements or features, under the laws of piecemeal activity and assimilation.

Nothing is less like the mysterious operations of a faculty of reasoning transcending the laws of connection-forming, than the behavior of men in response to novel situations. Let children who have hitherto confronted only such arithmetical tasks, in addition and subtraction with one- and two-place numbers and multiplication with one-place numbers, as those exemplified in the first line below, be told to do the examples shown in the second line.

ADD	ADD	ADD	SUBT.	SUBT.	MULTIPLY	MULTIPLY	MULTIPLY
8	37	35	8	37	8	9	6
5	24	68	5	24	5	7	3
—	—	23	—	—	—	—	—

19

MULTIPLY	MULTIPLY	MULTIPLY
32	43	34
23	22	26
—	—	—

They will add the numbers, or subtract the lower from the upper number, or multiply 3×2 and 2×3 , etc., getting 66, 86, and 624, or respond to the element of 'Multiply' attached to the two-place numbers by "I can't" or "I don't know what to do," or the like; or, if one is a child of great ability, he may consider the 'Multiply' element and the bigness of the numbers, be reminded by these two aspects of the situation of the fact that

'9
9 multiply'

gave only 81, and that

'10
10 multiply'

gave only 100, or the like; and so may report an intelligent and justified "I can't," or reject the plan of 3×2 and 2×3 , with 66, 86, and 624 for answers, as unsatisfactory. What the children will do will, in every case, be a product of the elements in the situation that are potent with them, the responses which these evoke, and the further associates which these responses in turn evoke. If the child were one of sufficient genius, he might infer the procedure to be followed as a result of his knowledge of the principles of decimal notation and the meaning of 'Multiply,' responding correctly to the 'place-value' element of each digit and adding his 6 tens and 9 tens, 20 twos and 3 thirties; but if he did thus invent the shorthand addition of a collection of twenty-three collections, each of 32 units, he would still do it by the operation of bonds, subtle but real.

Association by similarity is, as James showed long ago, simply the tendency of an element to provoke the responses which have been bound to it. *abcde* leads to *vwxxyz* because *a* has been bound to *vwxxyz* by original nature, exercise, or effect.

Purposive behavior is the most important case of the influence of the attitude or set or adjustment of an organism in determining (1) which bonds shall act, and (2) which results shall satisfy. James early described the former fact, showing that the mechanism of habit can give the directedness or purposefulness in thought's products, provided that mechanism includes something paralleling the problem, the aim, or need, in question.

The second fact, that the set or attitude of the man helps to determine which bonds shall satisfy, and which shall annoy, has commonly been somewhat obscured by vague assertions that the selection and retention is of what is "in point," or is "the right one," or is "appropriate," or the like. It is thus asserted, or at least hinted, that "the will," "the voluntary attention," "the consciousness of the problem," and other such entities are endowed with magic power to decide what is the "right" or "useful" bond and to kill off the others. The facts are that in purposive thinking and action, as everywhere else, bonds are selected and retained by the satisfyingness, and are killed off by the discomfort, which they produce; and that the potency of the man's set or attitude to make this satisfy and that annoy—to put certain conduction-units in readiness to act and others in unreadiness—is in every way as important as its potency to set certain conduction-units in actual operation.

Reasoning is not a radically different sort of force operating against habit but the organization and coöperation of many habits, thinking facts together. Reasoning is not the negation of ordinary bonds, but the action of many of them, especially of bonds with subtle elements of the situation. Some outside power does not enter to select and criticize; the pupil's own total repertory of bonds relevant to the problem is what selects and rejects. An unsuitable idea is not killed off by some *actus purus* of intellect, but by the ideas which it itself calls up, in connection with the total set of mind of the pupil, and which show it to be inadequate.

Almost nothing in arithmetic need be taught as a matter of mere unreasoning habit or memory, nor need anything, first taught as a principle, ever become a matter of mere habit or memory. $5 \times 4 = 20$ should not be learned as an isolated fact, nor remembered as we remember that Jones' telephone number is 648 J 2. Almost everything in arithmetic should be taught as a habit that has connections with habits already acquired and will work in an organization with other habits to come. The use of this organized hierarchy of habits to solve novel problems is reasoning.

CHAPTER XI

ORIGINAL TENDENCIES AND ACQUISITIONS BEFORE SCHOOL

THE UTILIZATION OF INSTINCTIVE INTERESTS

The activities essential to acquiring ability in arithmetic can rely on little in man's instinctive equipment beyond the purely intellectual tendencies of curiosity and the satisfyingness of thought for thought's sake, and the general enjoyment of success rather than failure in an enterprise to which one sets oneself. It is only by a certain amount of artifice that we can enlist other vehement inborn interests of childhood in the service of arithmetical knowledge and skill. When this can be done at no cost the gain is great. For example, marching in files of two, in files of three, in files of four, etc., raising the arms once, two times, three times, showing a foot, a yard, an inch with the hands, and the like are admirable because learning the meanings of numbers thus acquires some of the zest of the passion for physical action. Even in late grades chances to make pictures showing the relations of fractional parts, to cut strips, to fold paper, and the like will be useful.

Various social instincts can be utilized in matches after the pattern of the spelling match, contests between rows, certain number games, and the like. The scoring of both the play and the work of the classroom is a useful field for control by the teacher of arithmetic.

Hunt [12] has noted the more important games which have some considerable amount of arithmetical training as a by-product and which are more or less suitable for class use. Flynn [12] has described games, most of them for home use, which give very definite arithmetical drill, though in many cases the drills are rather behind the needs of children old enough to understand and like the game itself.

It is possible to utilize the interests in mystery, tricks, and puzzles so as to arouse a certain form of respect for arithmetic and also to get computational work done. I quote one simple case from Miss Selkin's admirable collection [12, p. 69 f.]—

I. ADDITION

"We must admit that there is nothing particularly interesting in a long column of numbers to be added. Let the teacher, however, suggest that he can write the answer at sight, and the task will assume a totally different aspect.

"A very simple number trick of this kind can be performed by making use of the principle of complementary addition. The arithmetical complement of a number with respect to a larger number is the difference between these two numbers. Most interesting results can be obtained by using complements with respect to 9.

"The children may be called upon to suggest several numbers of two, three, or more digits. Below these write an equal number of addends and immediately announce the answer. The children, impressed by this apparently rapid addition, will set to work enthusiastically to test the results of this lightning calculation.

"Example:—

$$\begin{array}{r} 357 \\ 682 \\ 793 \end{array} \quad \left. \vphantom{\begin{array}{r} 357 \\ 682 \\ 793 \end{array}} \right\} \quad A \quad \begin{array}{r} 999 \\ \times 3 \\ \hline 2997 \end{array}$$

642	}	B
317		
206		

"Explanation:—The addends in group A are written down at random or suggested by the class. Those in group B are their complements. To write the first number in group B we look at the first number in group A and, starting at the left write 6, the complement of 3 with respect to 9; 4, the complement of 5; 2, the complement of 7. The second and third addends in group B are derived in the same way. Since we have three addends in each group, the problem reduces itself to multiplying 999 by 3, or to taking $3000 - 3$. Any number of addends may be used and each addend may consist of any number of digits."

Respect for arithmetic as a source of tricks and magic is very much less important than respect for its everyday services; and computation to test such tricks is likely to be undertaken zealously only by the abler pupils. Consequently this source of interest should probably be used only sparingly, and perhaps the teacher should give such exhibitions only as a reward for efficiency in the regular work. For example, if the work for a week is well done in four days the fifth day might be given up to some semi-arithmetical entertainment, such as the demonstration of an adding machine, the story of primitive methods of counting, team races in computation, an exhibition of lightning calculation and intellectual sleight-of-hand by the teacher, or the voluntary study of arithmetical puzzles.

The interest in achievement, in success, mentioned above is stronger in children than is often realized and makes advisable the systematic use of the practice experiment as a method of teaching much of arithmetic. Children who thus compete with their own past records, keeping an exact score from week to week, make notable progress and enjoy hard work in making it.

THE ORDER OF DEVELOPMENT OF ORIGINAL TENDENCIES

Negatively the difficulty of the work that pupils should be expected to do is conditioned by the gradual maturing of their capacities. Other things being equal, the common custom of reserving hard things for late in the elementary school course is, of course, sound. It seems probable that little is gained by using any of the child's time for arithmetic before grade 2, though there are many arithmetical facts that he can learn in grade 1. Postponement of systematic work in arithmetic to grade 3 or even grade 4 is allowable if better things are offered. With proper textbooks and oral and written exercises, however, a child in grades 2 and 3 can spend time profitably on arithmetical work. When all children can be held in school through the eighth grade it does not much matter whether arithmetic is begun early or late. If, however, many children are to leave in grades 5 and 6 as now, we may think it wise to provide somehow that certain minima of arithmetical ability be given them.

There are, so far as is known, no special times and seasons at which the human animal by inner growth is specially ripe for one or another section or aspect of arithmetic, except in so far as the general inner growth of intellectual powers makes the more abstruse and complex tasks suitable to later and later years.

Indeed, very few of even the most enthusiastic devotees of the recapitulation theory or culture-epoch theory have attempted to apply either to the learning of arithmetic, and Branford is the only mathematician, so far as I know, who has advocated such application, even tempered by elaborate shiftings and reversals of the racial order. He says:—

"Thus, for each age of the individual life—infancy, childhood, school, college—may be selected from the racial history the most appropriate form in which mathematical experience can be assimilated. Thus the capacity of the infant and early childhood is comparable with the capacity of animal consciousness and primitive man. The mathematics suitable to later childhood and boyhood (and, of course, girlhood) is comparable with Archæan mathematics passing on through Greek and Hindu to mediæval European mathematics; while the student is become sufficiently mature to begin the assimilation of modern and highly abstract European thought. The filling in of details must necessarily be left to the individual teacher, and also, within some such broadly marked limits, the precise order of the marshalling of the material for each age. For, though, on the whole, mathematical development has gone forward, yet there have been lapses from advances

already made. Witness the practical world-loss of much valuable Hindu thought, and, for long centuries, the neglect of Greek thought: witness the world-loss of the invention by the Babylonians of the Zero, until re-invented by the Hindus, passed on by them to the Arabs, and by these to Europe.

"Moreover, many blunders and false starts and false principles have marked the whole course of development. In a phrase, rivers have their backwaters. But it is precisely the teacher's function to avoid such racial mistakes, to take short cuts ultimately discovered, and to guide the young along the road ultimately found most accessible with such halts and retracings—returns up side-cuts—as the mental peculiarities of the pupils demand.

"All this, the practical realization of the spirit of the principle, is to be wisely left to the mathematical teacher, familiar with the history of mathematical science and with the particular limitations of his pupils and himself." [08, p. 245.]

The latitude of modification suggested by Branford reduces the guidance to be derived from racial history to almost *nil*. Also it is apparent that the racial history in the case of arithmetical achievement is entirely a matter of acquisition and social transmission. Man's original nature is destitute of all arithmetical ideas. The human germs do not know even that one and one make two!

INVENTORIES OF ARITHMETICAL KNOWLEDGE AND SKILL

A scientific plan for teaching arithmetic would begin with an exact inventory of the knowledge and skill which the pupils already possessed. Our ordinary notions of what a child knows at entrance to grade 1, or grade 2, or grade 3, and of what a first-grade child or second-grade child can do, are not adequate. If they were, we should not find reputable textbooks arranging to teach elaborately facts already sufficiently well known to over three quarters of the pupils when they enter school. Nor should we find other textbooks presupposing in their first fifty pages a knowledge of words which not half of the children can read even at the end of the 2 B grade.

We do find just such evidence that ordinary ideas about the abilities of children at the beginning of systematic school training in arithmetic may be in gross error. For example, a reputable and in many ways admirable recent book has fourteen pages of exercises to teach the meaning of two and the fact that one and one make two! As an example of the reverse error, consider putting all these words in the first twenty-five pages of a beginner's book:—*absentees, attendance, blanks, continue, copy, during, examples, grouped, memorize, perfect, similar, splints, therefore, total!*

Little, almost nothing, has been done toward providing an exact inventory compared with what needs to be done. We may note here (1) the facts relevant to arithmetic found by Stanley Hall, Hartmann, and others in their general investigations of the knowledge possessed by children at entrance to school, (2) the facts concerning the power of children to perceive differences in length, area, size of collection, and organization within a collection such as is shown in Fig. 24, and certain facts and theories about early awareness of number.

In the Berlin inquiry of 1869, knowledge of the meaning of two, three, and four appeared in 74, 74, and 73 percent of the children upon entrance to school. Some of those recorded as ignorant probably really knew, but failed to understand that they were expected to reply or were shy. Only 85 percent were recorded as knowing their fathers' names. Seven eighths as many children knew the meanings of two, three, and four as knew their fathers' names. In a similar but more careful experiment with Boston children in September, 1880, Stanley Hall found that 92 percent knew three, 83 percent knew four, and 71½ percent knew five. Three was known about as well as the color red; four was known about as well as the color blue or yellow or green. Hartmann [90] found that two thirds of the children entering school in Annaberg could count from one to ten. This is about as many as knew money, or the familiar objects of the town, or could repeat words spoken to them.

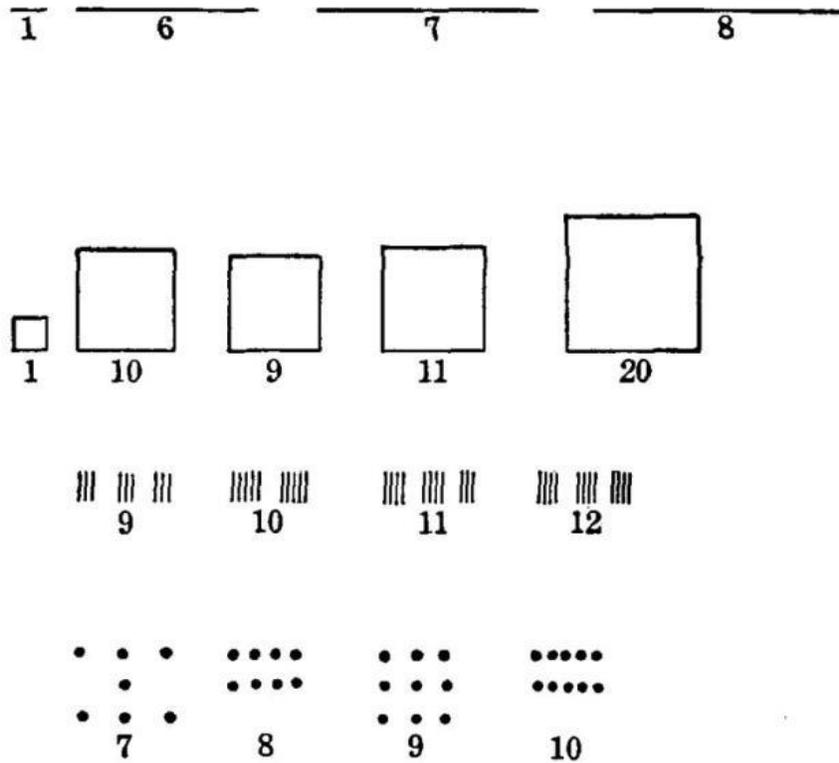


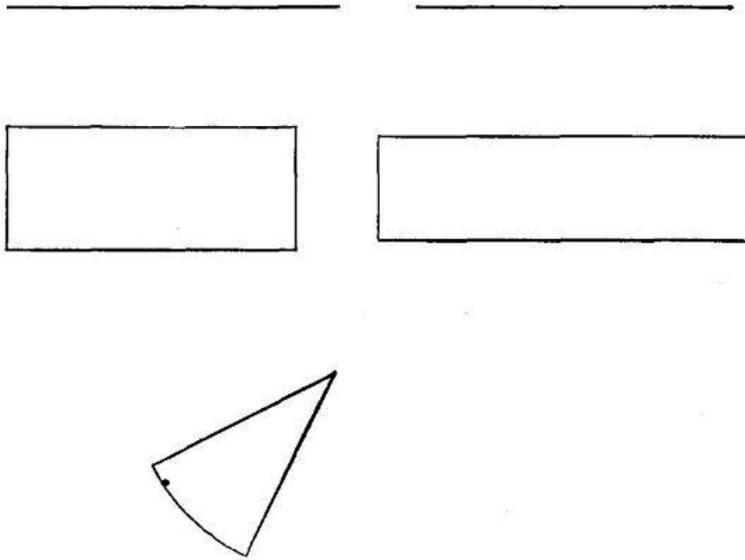
FIG. 24.—Objective presentation.

In the Stanford form of the Binet tests counting four pennies is given as an ability of the typical four-year-old. Counting 13 pennies correctly in at least one out of two trials, and knowing three of the four coins,—penny, nickel, dime, and quarter,—are given as abilities of the typical six-year-old.

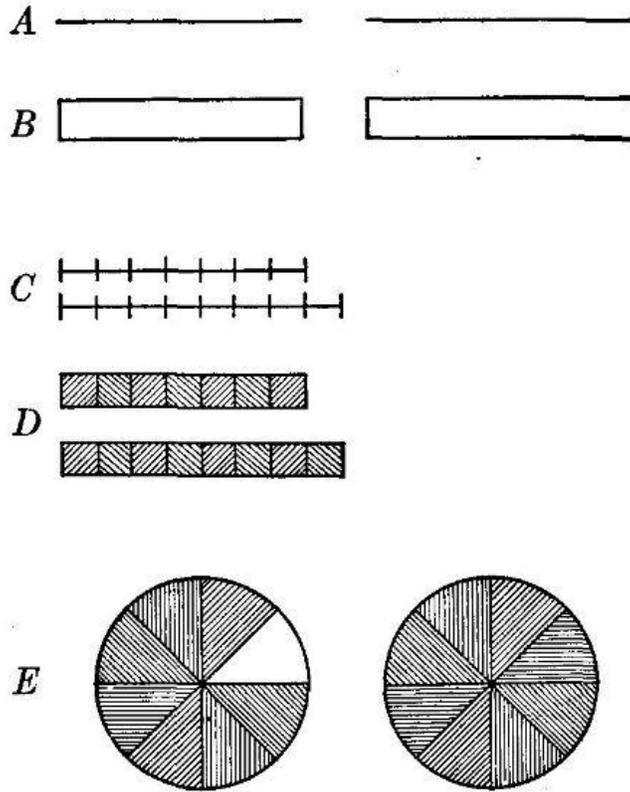
THE PERCEPTION OF NUMBER AND QUANTITY

We know that educated adults can tell how many lines or dots, etc., they see in a single glance (with an exposure too short for the eye to move) up to four or more, according to the clearness of the objects and their grouping. For example, Nanu ['04] reports that when a number of bright circles on a dark background are shown to educated adults for only .033 second, ten can be counted when arranged to form a parallelogram, but only five when arranged in a row. With certain groupings, of course, their 'perception' involves much inference, even conscious addition and multiplication. Similarly they can tell, up to twenty and beyond, the number of taps, notes, or other sounds in a series too rapid for single counting if the sounds are grouped in a convenient rhythm.

These abilities are, however, the product of a long and elaborate learning, including the learning of arithmetic itself. Elementary psychology and common experience teach us that the mere observation of groups or quantities, no matter how clear their number quality appears to the person who already knows the meanings of numbers, does not of itself create the knowledge of the meanings of numbers in one who does not. The experiments of Messenger ['03] and Burnett ['06] showed that there is no direct intuitive apprehension even of two as distinct from one. We have to *learn* to feel the two touches or see the two dots or lines as two.



We do not know by exact measurements the growth in children of this ability to count or infer the number of elements in a collection seen or series heard. Still less do we know what the growth would be without the influence of school training in counting, grouping, adding, and multiplying. Many textbooks and teachers seem to overestimate it greatly. Not all educated adults can, apart from measurement, decide with surety which of these lines is the longer, or which of these areas is the larger, or whether this is a ninth or a tenth or an eleventh of a circle.



Children upon entering school have not been tested carefully in respect to judgments of length and area, but we know from such studies as Gilbert's [94] that the difference required in their case is probably over twice that required for children of 13 or 14. In judging weights, for example, a difference of 6 is perceived as easily by children 13 to 15 years of age as a difference of 15 by six-year-olds.

A teacher who has adult powers of estimating length or area or weight and who also knows already which of the two is longer or larger or heavier, may use two lines to illustrate a difference which they really hide from the child. It is unlikely, for example, that the first of these lines _____ would be recognized as shorter than the second by every child in a fourth-grade class, and it is extremely unlikely that it would be recognized as being $\frac{7}{8}$ of the length of the latter, rather than $\frac{3}{4}$ of it or $\frac{5}{6}$ of it or $\frac{9}{10}$ of it or $\frac{11}{12}$ of it. If the two were shown to a second grade, with the question, "The first line is 7. How long is the other line?" there would be very many answers of 7 or 9; and these might be entirely correct arithmetically, the pupils' errors being all due to their inability to compare the lengths accurately.

The quantities used should be such that their mere discrimination offers no difficulty even to a child of blunted sense powers. If $\frac{7}{8}$ and 1 are to be compared, *A* and *B* are not allowable. *C*, *D*, and *E* are much better.

Teachers probably often underestimate or neglect the sensory difficulties of the tasks they assign and of the material they use to illustrate absolute and relative magnitudes. The result may be more pernicious when the pupils answer correctly than when they fail. For their correct answering may be due to their divination of what the teacher wants; and they may call a thing an inch larger to suit her which does not really seem larger to them at all. This, of course, is utterly destructive of their respect for arithmetic as an exact and matter-of-fact instrument. For example, if a teacher drew a series of lines 20, 21, 22, 23, 24,

and 25 inches long on the blackboard in this form— _____ and asked, "This is 20 inches long, how long is this?" she might, after some errors and correction thereof, finally secure successful response to all the lines by all the children. But their appreciation of the numbers 20, 21, 22, 23, 24, and 25 would be actually damaged by the exercise.

THE EARLY AWARENESS OF NUMBER

There has been some disagreement concerning the origin of awareness of number in the individual, in particular concerning the relative importance of the perception of how-many-ness and that of how-much-ness, of the perception of a defined aggregate and the perception of a defined ratio. (See McLellan and Dewey ['95], Phillips ['97 and '98], and Decroly and Degand ['12].)

The chief facts of significance for practice seem to be these: (1) Children with rare exceptions hear the names *one, two, three, four, half, twice, two times, more, less, as many as, again, first, second, and third*, long before they have analyzed out the qualities and relations to which these words refer so as to feel them at all clearly. (2) Their knowledge of the qualities and relations is developed in the main in close association with the use of these words to the child and by the child. (3) The ordinary experiences of the first five years so develop in the child awareness of the 'how many somethings' in various groups, of the relative magnitudes of two groups or quantities of any sort, and of groups and magnitudes as related to others in a series. For instance, if fairly gifted, a child comes, by the age of five, to see that a row of four cakes is an aggregate of four, seeing each cake as a part of the four and the four as the sum of its parts, to know that two of them are as many as the other two, that half of them would be two, and to think, when it is useful for him to do so, of four as a step beyond three on the way to five, or to think of hot as a step from warm on the way to very hot. The degree of development of these abilities depends upon the activity of the law of analysis in the individual and the character of his experiences.

(4) He gets certain bad habits of response from the ambiguity of common usage of 2, 3, 4, etc., for second, third, fourth. Thus he sees or hears his parents or older children or others count pennies or rolls or eggs by saying one, two, three, four, and so on. He himself is perhaps misled into so counting. Thus the names properly belonging to a series of aggregations varying in amount come to be to him the names of the positions of the parts in a counted whole. This happens especially with numbers above 3 or 4, where the correct experience of the number as a name for the group has rarely been present. This attaching to the cardinal numbers above three or four the meanings of the ordinal numbers seems to affect many children on entrance to school. The numbering of pages in books, houses, streets, etc., and bad teaching of counting often prolong this error.

(5) He also gets the habit, not necessarily bad, but often indirectly so, of using many names such as eight, nine, ten, eleven, fifteen, a hundred, a million, without any meaning.

(6) The experiences of half, twice, three times as many, three times as long, etc., are rarer; even if they were not, they would still be less easily productive of the analysis of the proper abstract element than are the experiences of two, three, four, etc., in connection with aggregates of things each of which is usually called one, such as boys, girls, balls, apples. Experiences of the names, two, three, and four, in connection with two twos, two threes, two fours, are very rare.

Hence, the names, two, three, etc., mean to these children in the main, "one something and one something," "one something usually called one, and one something usually called one, and another something usually called one," and more rarely and imperfectly "two times anything," "three times anything," etc.

With respect to Mr. Phillips' emphasis of the importance of the series-idea in children's minds, the matters of importance are: first, that the knowledge of a series of number names in order is of very little consequence to the teaching of arithmetic and of still less to the origin of awareness of number. Second,

the habit of applying this series of words in counting in such a way that 8 is associated with the eighth thing, 9 with the ninth thing, etc., is of consequence because it does so much mischief. Third, the really valuable idea of the number series, the idea of a series of groups or of magnitudes varying by steps, is acquired later, as a result, not a cause, of awareness of numbers.

With respect to the McLellan-Dewey doctrine, the ratio aspect of numbers should be emphasized in schools, not because it is the main origin of the child's awareness of number, but because it is *not*, and because the ordinary practical issues of child life do *not* adequately stimulate its action. It also seems both more economical and more scientific to introduce it through multiplication, division, and fractions rather than to insist that 4 and 5 shall from the start mean 4 or 5 times anything that is called 1, for instance, that 8 inches shall be called 4 two-inches, or 10 cents, 5 two-cents. If I interpret Professor Dewey's writings correctly, he would agree that the use of inch, foot, yard, pint, quart, ounce, pound, glassful, cupful, handful, spoonful, cent, nickel, dime, and dollar gives a sufficient range of units for the first two school years. Teaching the meanings of $\frac{1}{2}$ of 4, $\frac{1}{2}$ of 6, $\frac{1}{2}$ of 8, $\frac{1}{2}$ of 10, $\frac{1}{2}$ of 20, $\frac{1}{3}$ of 6, $\frac{1}{3}$ of 9, $\frac{1}{3}$ of 30, $\frac{1}{4}$ of 8, two 2s, five 2s, and the like, in early grades, each in connection with many different units of measure, provides a sufficient assurance that numbers will connect with relationships as well as with collections.

CHAPTER XII

INTEREST IN ARITHMETIC

CENSUSES OF PUPILS' INTERESTS

Arithmetic, although it makes little or no appeal to collecting, muscular manipulation, sensory curiosity, or the potent original interests in things and their mechanisms and people and their passions, is fairly well liked by children. The censuses of pupils' likes and dislikes that have been made are not models of scientific investigation, and the resulting percentages should not be used uncritically. They are, however, probably not on the average over-favorable to arithmetic in any unfair way. Some of their results are summarized below. In general they show arithmetic to be surpassed in interest clearly by only the manual arts (shopwork and manual training for boys, cooking and sewing for girls), drawing, certain forms of gymnastics, and history. It is about on a level with reading and science. It clearly surpasses grammar, language, spelling, geography, and religion.

Lobsien ['03], who asked one hundred children in each of the first five grades (*Stufen*) of the elementary schools of Kiel, "Which part of the school work (literally, 'which instruction period') do you like best?" found arithmetic led only by drawing and gymnastics in the case of the boys, and only by handwork in the case of the girls.

This is an exaggerated picture of the facts, since no count is made of those who especially dislike arithmetic. Arithmetic is as unpopular with some as it is popular with others. When full allowance is made for this, arithmetic still has popularity above the average. Stern ['05] asked, "Which subject do you like most?" and "Which subject do you like least?" The balance was greatly in favor of gymnastics for boys (28-1), handwork for girls (32-1½), and drawing for both (16½-6). Writing (6½-4), arithmetic (14½-13), history (9-6½), reading (8½-8), and singing (6-7½) come next. Religion, nature study, physiology, geography, geometry, chemistry, language, and grammar are low.

McKnight ['07] found with boys and girls in grades 7 and 8 of certain American cities that arithmetic was liked better than any of the school subjects except gymnastics and manual training. The vote as compared with history was:—

Arithmetic	327 liked greatly,	96 disliked greatly.
History	164 liked greatly,	113 disliked greatly.

In a later study Lobsien ['09] had 6248 pupils from 9 to 15 years old representing all grades of the elementary school report, so far as they could, the subject most disliked, the subject most liked, the subject next most liked, and the subject next in order. No child was forced to report all of these four judgments, or even any of them. Lobsien counts the likes and the dislikes for each subject. Gymnastics, handwork, and cooking are by far the most popular. History and drawing are next, followed by arithmetic and reading. Below these are geography, writing, singing, nature study, biblical history, catechism, and three minor subjects.

Lewis ['13] secured records from English children in elementary schools of the order of preference of all the studies listed below. He reports the results in the following table of percents:

|	TOP THIRD	|	MIDDLE THIRD	|	LOWEST THIRD
--	------------------	--	---------------------	--	---------------------

	OF STUDIES FOR INTEREST	OF STUDIES FOR INTEREST	OF STUDIES FOR INTEREST
Drawing	78	20	2
Manual Subjects	66	26	8
History	64	24	12
Reading	53	38	9
Singing	32	48	20
Drill	20	55	25
Arithmetic	16	53	31
Science	23	37	40
Nature Study	16	36	48
Dictation	4	57	39
Composition	18	28	54
Scripture	4	38	58
Recitation	9	23	68
Geography	4	24	72
Grammar	—	6	94

Brandell ['13] obtained data from 2137 Swedish children in Stockholm (327), Norrköping (870), and Gothenburg (940).

In general he found, as others have, that handwork, shopwork for boys and household work for girls, and drawing were reported as much better liked than arithmetic. So also was history, and (in this he differs from most students of this matter) so were reading and nature study. Gymnastics he finds less liked than arithmetic. Religion, geography, language, spelling, and writing are, as in other studies, much less popular than arithmetic.

Other studies are by Lilius ['11] in Finland, Walsemann ['07], Wiederkehr ['07], Pommer ['14], Seekel ['14], and Stern ['13 and '14], in Germany. They confirm the general results stated.

The reasons for the good showing that arithmetic makes are probably the strength of its appeal to the interest in definite achievement, success, doing what one attempts to do; and of its appeal, in grades 5 to 8, to the practical interest of getting on in the world, acquiring abilities that the world pays for. Of these, the former is in my opinion much the more potent interest. Arithmetic satisfies it especially well, because, more than any other of the 'intellectual' studies of the elementary school, it permits the pupil to see his own progress and determine his own success or failure.

The most important applications of the psychology of satisfiers and annoyers to arithmetic will therefore be in the direction of utilizing still more effectively this interest in achievement. Next in importance come the plans to attach to arithmetical learning the satisfyingness of bodily action, play, sociability, cheerfulness, and the like, and of significance as a means of securing other desired ends than arithmetical abilities themselves. Next come plans to relieve arithmetical learning from certain discomforts such as the eyestrain of some computations and excessive copying of figures. These will be discussed here in the inverse order.

RELIEVING EYESTRAIN

At present arithmetical work is, hour for hour, probably more of a tax upon the eyes than reading. The task of copying numbers from a book to a sheet of paper is one of the very hardest tasks that the eyes of a

pupil in the elementary schools have to perform. A certain amount of such work is desirable to teach a child to write numbers, to copy exactly, and to organize material in shape for computation. But beyond that, there is no more reason for a pupil to copy every number with which he is to compute than for him to copy every word he is to read. The meaningless drudgery of copying figures should be mitigated by arranging much work in the form of exercises like those shown on pages 216, 217, and 218, and by having many of the textbook examples in addition, subtraction, and multiplication done with a slip of paper laid below the numbers, the answers being written on it. There is not only a resulting gain in interest, but also a very great saving of time for the pupil (very often copying an example more than quadruples the time required to get its answer), and a much greater efficiency in supervision. Arithmetical errors are not confused with errors of copying,^[16] and the teacher's task of following a pupil's work on the page is reduced to a minimum, each pupil having put the same part of the day's work in just the same place. The use of well-printed and well-spaced pages of exercises relieves the eyestrain of working with badly made gray figures, unevenly and too closely or too widely spaced. I reproduce in Fig. 25 specimens taken at random from one hundred random samples of arithmetical work by pupils in grade 8. Contrast the task of the eyes in working with these and their task in working with pages 216 to 218. The customary method of always copying the numbers to be used in computation from blackboard or book to a sheet of paper is an utterly unjustifiable cruelty and waste.

$$\begin{array}{r}
 7 \\
 \frac{2}{14} \\
 \frac{65}{79}
 \end{array}
 \quad
 \begin{array}{r}
 7 \\
 \frac{2}{1}
 \end{array}
 \quad
 \begin{array}{r}
 \times \frac{21}{11} \\
 \frac{21}{11}
 \end{array}
 \quad
 \begin{array}{r}
 7 \\
 \frac{1}{10} \sqrt{7.00} \\
 66 \cancel{4} \\
 40 \\
 33 \\
 \hline
 7
 \end{array}$$

$$2.70 \times \frac{1}{4} = \frac{2.70}{4} \begin{array}{r} 270 \\ 4 \overline{) 270} \\ \underline{68} \\ 60 \\ \underline{60} \\ 0 \end{array} \frac{2}{4}$$

$$\begin{array}{r}
 \$1.20 \\
 4 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 3(1.20) \\
 40 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 \$21 \\
 5 \frac{1}{2} \\
 \hline
 10 \frac{1}{2} \\
 \hline
 105 \\
 \hline
 \$115.50
 \end{array}$$

$$\begin{array}{r}
 84 \\
 50 \\
 \hline
 134
 \end{array}
 \quad
 \begin{array}{r}
 \$1.20 \\
 120 \\
 \hline
 120
 \end{array}$$

$$\begin{array}{r}
 6 \\
 \hline
 37 \overline{) 2516} \\
 \underline{222} \\
 296
 \end{array}
 \quad
 \begin{array}{r}
 21 \\
 5 \frac{1}{2} \\
 \hline
 2 \overline{) 21} \\
 10 \\
 \hline
 105 \\
 \hline
 115
 \end{array}
 \quad
 \begin{array}{r}
 21 \\
 10 \frac{1}{2} \\
 \hline
 21 \\
 \hline
 \$131 \frac{1}{2}
 \end{array}$$

FIG. 25a.—Specimens taken at random from the computation work of eighth-grade pupils. This computation occurred in a genuine test. In the original gray of the pencil marks the work is still harder to make out.

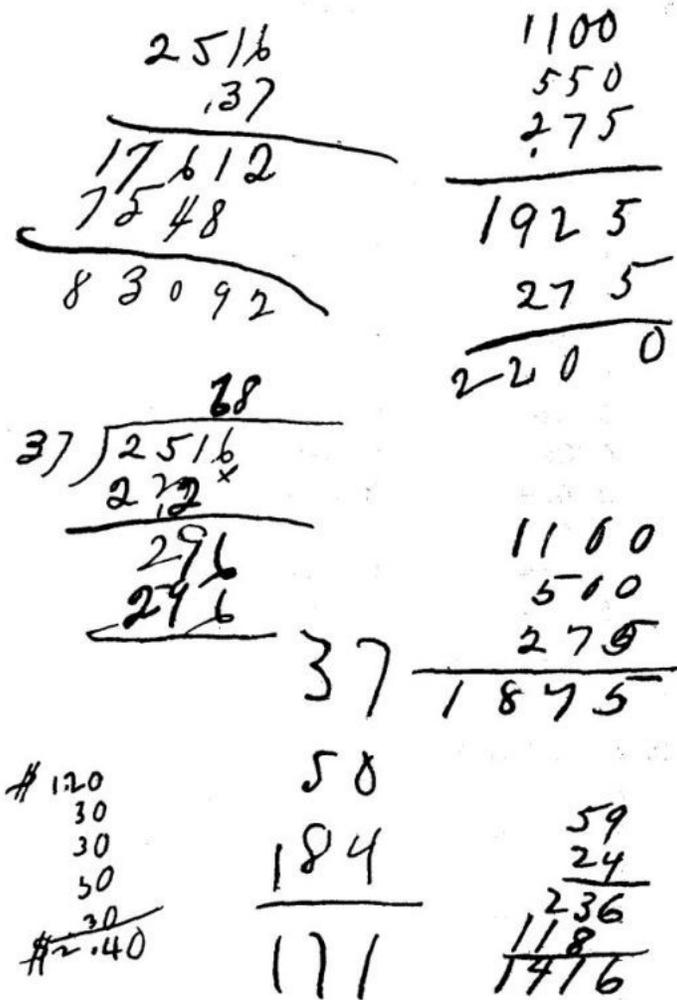


FIG. 25b.—Specimens taken at random from the computation work of eighth-grade pupils. This computation occurred in a genuine test. In the original gray of the pencil marks the work is still harder to make out.

Write the products:—

- | | | |
|-----------|-----------|-----------|
| A. 3 4s = | B. 5 7s = | C. 9 2s = |
| 5 2s = | 8 3s = | 4 4s = |
| 7 2s = | 4 2s = | 2 7s = |
| 1 6 = | 4 5s = | 6 4s = |
| 1 3 = | 4 7s = | 5 5s = |
| 3 7s = | 5 9s = | 3 6s = |
| 4 1s = | 7 5s = | 3 2s = |
| 6 8s = | 7 1s = | 3 9s = |
| 9 8s = | 6 3s = | 5 1s = |
| 4 3s = | 4 9s = | 8 6s = |
| 2 4s = | 3 5s = | 8 4s = |
| 2 2s = | 9 6s = | 8 5s = |
| 8 7s = | 2 5s = | 7 9s = |

$5 \ 8s =$	$5 \ 4s =$	$6 \ 2s =$
$7 \ 6s =$	$8 \ 2s =$	$7 \ 4s =$
$7 \ 3s =$	$8 \ 9s =$	$9 \ 3s =$
D. $4 \ 20s =$	E. $9 \ 60s =$	F. $40 \times 2 = 80$
$4 \ 200s =$	$9 \ 600s =$	$20 \times 2 =$
$6 \ 30s =$	$5 \ 30s =$	$30 \times 2 =$
$6 \ 300s =$	$5 \ 300s =$	$40 \times 2 =$
$7 \times 50 =$	$8 \times 20 =$	$20 \times 3 =$
$7 \times 500 =$	$8 \times 200 =$	$30 \times 3 =$
$3 \times 40 =$	$2 \times 70 =$	$300 \times 3 = 900$
$3 \times 400 =$	$2 \times 700 =$	$300 \times 2 =$

Write the missing numbers: (r stands for remainder.)

$25 = \dots 3s \text{ and } \dots r.$	$30 = \dots 4s \text{ and } \dots r.$
$25 = \dots 4s \text{ " } \dots r.$	$30 = \dots 5s \text{ " } \dots r.$
$25 = \dots 5s \text{ " } \dots r.$	$30 = \dots 6s \text{ " } \dots r.$
$25 = \dots 6s \text{ " } \dots r.$	$30 = \dots 7s \text{ " } \dots r.$
$25 = \dots 7s \text{ " } \dots r.$	$30 = \dots 8s \text{ " } \dots r.$
$25 = \dots 8s \text{ " } \dots r.$	$30 = \dots 9s \text{ " } \dots r.$
$25 = \dots 9s \text{ " } \dots r.$	

$26 = \dots 3s \text{ and } \dots r.$	$31 = \dots 4s \text{ and } \dots r.$
$26 = \dots 4s \text{ " } \dots r.$	$31 = \dots 5s \text{ " } \dots r.$
$26 = \dots 5s \text{ " } \dots r.$	$31 = \dots 6s \text{ " } \dots r.$
$26 = \dots 6s \text{ " } \dots r.$	$31 = \dots 7s \text{ " } \dots r.$
$26 = \dots 7s \text{ " } \dots r.$	$31 = \dots 8s \text{ " } \dots r.$
$26 = \dots 8s \text{ " } \dots r.$	$31 = \dots 9s \text{ " } \dots r.$
$26 = \dots 9s \text{ " } \dots r.$	

Write the whole numbers or mixed numbers which these fractions equal:—

$\frac{5}{4}$	$\frac{4}{3}$	$\frac{9}{5}$	$\frac{4}{2}$	$\frac{7}{3}$
$\frac{7}{4}$	$\frac{5}{3}$	$\frac{11}{8}$	$\frac{3}{2}$	$\frac{8}{8}$
$\frac{8}{4}$	$\frac{6}{3}$	$\frac{9}{8}$	$\frac{9}{4}$	$\frac{16}{8}$
$\frac{11}{4}$	$\frac{7}{5}$	$\frac{13}{8}$	$\frac{8}{5}$	$\frac{6}{6}$

Write the missing figures:—

$$\frac{6}{8} = \frac{\quad}{4} \quad \frac{2}{4} = \frac{\quad}{2} \quad \frac{8}{10} = \frac{\quad}{5} \quad \frac{1}{5} = \frac{\quad}{10} \quad \frac{2}{3} = \frac{\quad}{\quad}$$

Write the missing numerators:—

$\frac{1}{2}$	=	$\frac{\quad}{12}$	$\frac{\quad}{8}$	$\frac{\quad}{10}$	$\frac{\quad}{4}$	$\frac{\quad}{16}$	$\frac{\quad}{6}$	$\frac{\quad}{14}$
$\frac{1}{3}$	=	$\frac{\quad}{12}$	$\frac{\quad}{9}$	$\frac{\quad}{18}$	$\frac{\quad}{6}$	$\frac{\quad}{15}$	$\frac{\quad}{24}$	$\frac{\quad}{21}$
1	=							

$\frac{4}{5}$	=	$\frac{12}{10}$	$\frac{16}{20}$	$\frac{8}{15}$	$\frac{24}{25}$	$\frac{20}{40}$	$\frac{28}{35}$	$\frac{32}{30}$
$\frac{2}{3}$	=	$\frac{12}{18}$	$\frac{16}{21}$	$\frac{8}{6}$	$\frac{24}{15}$	$\frac{20}{24}$	$\frac{28}{24}$	$\frac{32}{9}$
$\frac{3}{4}$	=	$\frac{8}{16}$	$\frac{16}{12}$	$\frac{8}{20}$	$\frac{24}{24}$	$\frac{20}{32}$	$\frac{28}{32}$	$\frac{32}{28}$

Find the products. Cancel when you can:—

$$\frac{5}{16} \times 4 = \quad \frac{11}{12} \times 3 = \quad \frac{2}{3} \times 5 =$$

$$\frac{7}{12} \times 8 = \quad \frac{8}{5} \times 15 = \quad \frac{1}{6} \times 8 =$$

SIGNIFICANCE FOR RELATED ACTIVITIES

The use of bodily action, social games, and the like was discussed in the section on original tendencies. "Significance as a means of securing other desired ends than arithmetical learning itself" is therefore our next topic. Such significance can be given to arithmetical work by using that work as a means to present and future success in problems of sports, housekeeping, shopwork, dressmaking, self-management, other school studies than arithmetic, and general school life and affairs. Significance as a means to future ends alone can also be more clearly and extensively attached to it than it now is.

Whatever is done to supply greater strength of motive in studying arithmetic must be carefully devised so as not to get a strong but wrong motive, so as not to get abundant interest but in something other than arithmetic, and so as not to kill the goose that after all lays the golden eggs—the interest in intellectual activity and achievement itself. It is easy to secure an interest in laying out a baseball diamond, measuring ingredients for a cake, making a balloon of a certain capacity, or deciding the added cost of an extra trimming of ribbon for one's dress. The problem is to *attach* that interest to arithmetical learning. Nor should a teacher be satisfied with attaching the interest as a mere tail that steers the kite, so long as it stays on, or as a sugar-coating that deceives the pupil into swallowing the pill, or as an anodyne whose dose must be increased and increased if it is to retain its power. Until the interest permeates the arithmetical activity itself our task is only partly done, and perhaps is made harder for the next time.

One important means of really interfusing the arithmetical learning itself with these derived interests is to lead the pupil to seek the help of arithmetic himself—to lead him, in Dewey's phrase, to 'feel the need'—to take the 'problem' attitude—and thus appreciate the technique which he actively hunts for to satisfy the need. In so far as arithmetical learning is organized to satisfy the practical demands of the pupil's life at the time, he should, so to speak, come part way to get its help.

Even if we do not make the most skillful use possible of these interests derived from the quantitative problems of sports, housekeeping, shopwork, dressmaking, self-management, other school studies, and school life and affairs, the gain will still be considerable. To have them in mind will certainly preserve us from giving to children of grades 3 and 4 problems so devoid of relation to their interests as those shown below, all found (in 1910) in thirty successive pages of a book of excellent repute:—

A chair has 4 legs. How many legs have 8 chairs? 5 chairs?

A fly has 6 legs. How many legs have 3 flies? 9 flies? 7 flies?

(Eight more of the same sort.)

In 1890 New York had 1,513,501 inhabitants, Milwaukee had 206,308, Boston had 447,720, San Francisco 297,990. How many had these cities together?

(Five more of the same sort.)

Milton was born in 1608 and died in 1674. How many years did he live?

(Several others of the same sort.)

The population of a certain city was 35,629 in 1880 and 106,670 in 1890. Find the increase.

(Several others of this sort.)

A number of others about the words in various inaugural addresses and the Psalms in the Bible.

It also seems probable that with enough care other systematic plans of textbooks can be much improved in this respect. From every point of view, for example, the early work in arithmetic should be adapted to some extent to the healthy childish interests in home affairs, the behavior of other children, and the activities of material things, animals, and plants.

TABLE 9

FREQUENCY OF APPEARANCE OF CERTAIN WORDS ABOUT FAMILY LIFE, PLAY, AND ACTION IN EIGHT ELEMENTARY TEXTBOOKS IN ARITHMETIC, pp. 1-50.

	A	B	C	D	E	F	G	H
baby				2		4		
brother	2		6	1	1		1	
family			2		2		4	
father	1		3	5		2	1	
help								
home	2		4	4	2	2	7	1
mother	4	2	9	5		5	1	7
sister			1	2	2	9	1	1
fork								
knife								
plate	4	2		2		1		
spoon								
doll	10	1	10	6		10		9
game	1			3			5	5
jump								4
marbles	10	4	10		10		1	
play			1			3		
run						1		3
sing								
tag								
toy								1
car			2	4		2	3	1
cut			10		6	2		8
dig							2	
flower	1			4	1	1	2	
grow				1				
plant			2					
seed				3			1	
string					1	10	1	1
wheel	5					10		

The words used by textbooks give some indication of how far this aim is being realized, or rather of how far short we are of realizing it. Consider, for example, the words home, mother, father, brother, sister, help, plate, knife, fork, spoon, play, game, toy, tag, marbles, doll, run, jump, sing, plant, seed, grow, flower, car, wheel, string, cut, dig. The frequency of appearance in the first fifty pages of eight beginners' arithmetics was as shown in Table

9. The eight columns refer to the eight books (the first fifty pages of each). The numbers refer to the number of times the word in question appeared, the number 10 meaning 10 *or more* times in the fifty pages. Plurals, past tenses, and the like were counted. *Help, fork, knife, spoon, jump, sing, and tag* did not appear at all! *Toy* and *grow* appeared each once in the 400 pages! *Play, run, dig, plant, and seed* appeared once in a hundred or more pages. *Baby* did not appear as often as *buggy*. *Family* appeared no oftener than *fence* or *Friday*. *Father* appears about a third as often as *farmer*.

Book A shows only 10 of these thirty words in the fifty pages; book B only 4; book C only 12; and books D, E, F, G, and H only 13, 8, 14, 13, 10, respectively. The total number of appearances (counting the 10s as only 10 in each case) is 40 for A, 9 for B, 60 for C, 42 for D, 25 for E, 62 for F, 30 for G, and 37 for H. The five words—apple, egg, Mary, milk, and orange—are used oftener than all these thirty together.

If it appeared that this apparent neglect of childish affairs and interests was deliberate to provide for a more systematic treatment of pure arithmetic, a better gradation of problems, and a better preparation for later genuine use than could be attained if the author of the textbook were tied to the child's apron strings, the neglect could be defended. It is not at all certain that children in grade 2 get much more enjoyment or ability from adding the costs of purchases for Christmas or Fourth of July, or multiplying the number of cakes each child is to have at a party by the number of children who are to be there, than from adding gravestones or multiplying the number of hairs of bald-headed men. When, however, there is nothing gained by substituting remote facts for those of familiar concern to children, the safe policy is surely to favor the latter. In general, the neglect of childish data does not seem to be due to provision for some other end, but to the same inertia of tradition which has carried over the problems of laying walls and digging wells into city schools whose children never saw a stone wall or dug well.

I shall not go into details concerning the arrangement of courses of study, textbooks, and lesson-plans to make desirable connections between arithmetical learning and sports, housework, shopwork, and the rest. It may be worth while, however, to explain the term *self-management*, since this source of genuine problems of real concern to the pupils has been overlooked by most writers.

By self-management is meant the pupil's use of his time, his abilities, his knowledge, and the like. By the time he reaches grade 5, and to some extent before then, a boy should keep some account of himself, of how long it takes him to do specified tasks, of how much he gets done in a specified time at a certain sort of work and with how many errors, of how much improvement he makes month by month, of which things he can do best, and the like. Such objective, matter-of-fact, quantitative study of one's behavior is not a stimulus to morbid introspection or egotism; it is one of the best preventives of these. To treat oneself impersonally is one of the essential elements of mental balance and health. It need not, and should not, encourage priggishness. On the contrary, this matter-of-fact study of what one is and does may well replace a certain amount of the exhortations and admonitions concerning what one ought to do and be. All this is still truer for a girl.

The demands which such an accounting of one's own activities make of arithmetic have the special value of connecting directly with the advanced work in computation. They involve the use of large numbers, decimals, averaging, percentages, approximations, and other facts and processes which the pupil has to learn for later life, but to which his childish activities as wage-earner, buyer and seller, or shopworker from 10 to 14 do not lead. Children have little money, but they have time in thousands of units! They do not get discounts or bonuses from commercial houses, but they can discount their quantity of examples done for the errors made, and credit themselves with bonuses of all sorts for extra achievements.

INTRINSIC INTEREST IN ARITHMETICAL LEARNING

There remains the most important increase of interest in arithmetical learning—an increase in the interest directly bound to achievement and success in arithmetic itself. "Arithmetic," says David Eugene Smith, "is a game and all boys and girls are players." It should not be a *mere* game for them and they should not *merely* play, but their unpractical interest in doing it because they can do it and can see how well they do it is one of the school's most precious assets. Any healthy means to give this interest more and better stimulus should therefore be eagerly sought and cherished.

Two such means have been suggested in other connections. The first is the extension of training in checking and verifying work so that the pupil may work to a standard of approximately 100% success, and may know how nearly he is attaining it. The second is the use of standardized practice material and tests, whereby the pupil may measure himself against his own past, and have a clear, vivid, and trustworthy idea of just how much better or faster he can do the same tasks than he could do a month or a year ago, and of just how much harder things he can do now than then.

Another means of stimulating the essential interest in quantitative thinking itself is the arrangement of the work so that real arithmetical thinking is encouraged more than mere imitation and assiduity. This means the avoidance of long series of applied problems all of one type to be solved in the same way, the avoidance of miscellaneous series and review series which are almost verbatim repetitions of past problems, and in general the avoidance of excessive repetition of any one problem-situation. Stimulation to real arithmetical thinking is weak when a whole day's problem work requires no choice of methods, or when a review simply repeats without any step of organization or progress, or when a pupil meets a situation (say the 'buy x things at y per thing, how much pay' situation) for the five-hundredth time.

Another matter worthy of attention in this connection is the unwise tendency to omit or present in diluted form some of the topics that appeal most to real intellectual interests, just because they are hard. The best illustration, perhaps, is the problem of ratio or "How many times as large (long, heavy, expensive, etc.) as x is y ?" Mastery of the 'times as' relation is hard to acquire, but it is well worth acquiring, not only because of its strong intellectual appeal, but also because of its prime importance in the applications of arithmetic to science. In the older arithmetics it was confused by pedantries and verbal difficulties and penalized by unreal problems about fractions of men doing parts of a job in strange and devious times. Freed from these, it should be reinstated, beginning as early as grade 5 with such simple exercises as those shown below and progressing to the problems of food values, nutritive ratios, gears, speeds, and the like in grade 8.

John is 4 years old.
Fred is 6 years old.
Mary is 8 years old.
Nell is 10 years old.
Alice is 12 years old.
Bert is 15 years old.

Who is twice as old as John?
Who is half as old as Alice?
Who is three times as old as John?
Who is one and one half times as old as Nell?
Who is two thirds as old as Fred?
etc., etc., etc.

Alice is times as old as John.
John is as old as Mary.
Fred is times as old as John.
Alice is times as old as Fred.
Fred is as old as Mary.
etc., etc., etc.

Finally it should be remembered that all improvements in making arithmetic worth learning and helping the pupil to learn it will in the long run add to its interest. Pupils like to learn, to achieve, to gain mastery. Success is interesting. If the measures recommended in the previous chapters are carried out, there will be little need to entice pupils to take arithmetic or to sugar-coat it with illegitimate attractions.

CHAPTER XIII

THE CONDITIONS OF LEARNING

We shall consider in this chapter the influence of time of day, size of class, and amount of time devoted to arithmetic in the school program, the hygiene of the eyes in arithmetical work, the use of concrete objects, and the use of sounds, sights, and thoughts as situations and of speech and writing and thought as responses.^[17]

EXTERNAL CONDITIONS

Computation of one or another sort has been used by several investigators as a test of efficiency at different times in the day. When freed from the effects of practice on the one hand and lack of interest due to repetition on the other, the results uniformly show an increase in speed late in the school session with a falling off in accuracy that about balances it.^[18] There is no wisdom in putting arithmetic early in the session because of its *difficulty*. Lively and sociable exercises in mental arithmetic with oral answers in fact seem to be admirably fitted for use late in the session. Except for the general principles (1) of starting the day with work that will set a good standard of cheerful, efficient production and (2) of getting the least interesting features of the day's work done fairly early in the day, psychology permits practical exigencies to rule the program, so far as present knowledge extends. Adequate measurements of the effect of time of day on *improvement* have not been made, but there is no reason to believe that any one time between 9 A.M. and 4 P.M. is appreciably more favorable to arithmetical learning than to learning geography, history, spelling, and the like.

The influence of size of class upon progress in school studies is very difficult to measure because (1) within the same city system the average of the six (or more) sizes of class that a pupil has experienced will tend to approximate closely to the corresponding average for any other child; because further (2) there may be a tendency of supervisory officers to assign more pupils to the better teachers; and because (3) separate systems which differ in respect to size of class probably differ in other respects also so that their differences in achievement may be referable to totally different differences.

Elliott [14] has made a beginning by noting size of class during the year of test in connection with his own measures of the achievements of seventeen hundred pupils, supplemented by records from over four hundred other classes. As might be expected from the facts just stated, he finds no appreciable difference between classes of different sizes within the same school system, the effect of the few months in a small class being swamped by the antecedents or concomitants thereof.

The effect of the amount of time devoted to arithmetic in the school program has been studied extensively by Rice [02 and '03] and Stone [08].

Dr. Rice [02] measured the arithmetical ability of some 6000 children in 18 different schools in 7 different cities. The results of these measurements are summarized in Table 10. This table "gives two averages for each grade as well as for each school as a whole. Thus, the school at the top shows averages of 80.0 and 83.1, and the one at the bottom, 25.3 and 31.5. The first represents the percentage of answers which were absolutely correct; the second shows what per cent of the problems were correct in principle, *i.e.* the average that would have been received if no mechanical errors had been made."

The facts of Dr. Rice's table show that there is a positive relation between the general standing of a school system in the tests and the amount of time devoted to arithmetic by its program. The relation is not close, however, being that expressed by a correlation coefficient of .36½. Within any one school system there is no relation between the standing of a particular school and the amount of time devoted to arithmetic in that school's program. It must be kept in mind that the amount of time given in the school program may be counterbalanced by emphasizing work at home and during study periods, or, on the other hand, may be a symptom of correspondingly small or great emphasis on arithmetic in work set for the study periods at home.

A still more elaborate investigation of this same topic was made by Stone ['08]. I quote somewhat fully from it, since it is an instructive sample of the sort of studies that will doubtless soon be made in the case of every elementary school subject. He found that school systems differed notably in the achievements made by their sixth-grade pupils in his tests of computation (the so-called 'fundamentals') and of the solution of verbally described problems (the so-called 'reasoning'). The facts were as shown in Table 11.

TABLE 10

AVERAGES FOR INDIVIDUAL SCHOOLS IN ARITHMETIC

CITY	SCHOOL	6TH YEAR		7TH YEAR		8TH YEAR		SCHOOL AVERAGE		
		Result	Principle	Result	Principle	Result	Principle	Result	Principle	Percent of Mechanical Errors
III	1	79.3	80.3	81.1	82.3	91.7	93.9	80.0	83.1	3.7
I	1	80.4	81.5	64.2	67.2	80.9	82.8	76.6	80.3	4.6
I	2	80.9	83.4	43.5	50.9	72.7	79.1	69.3	75.1	7.7
I	3	72.2	74.0	63.5	66.2	74.5	76.6	67.8	72.2	6.1
I	4	69.9	72.2	54.6	57.8	66.5	69.1	64.3	70.3	8.5
II	1	71.2	75.3	33.6	35.7	36.8	40.0	60.2	64.8	7.1
III	2	43.7	45.0	53.9	56.7	51.1	53.1	54.5	58.9	7.4
IV	1	58.9	60.4	31.2	34.1	41.6	43.5	55.1	58.4	5.6
IV	2	59.8	63.1	—	—	22.5	22.5	53.9	58.8	8.3
IV	3	54.9	58.1	35.2	38.6	43.5	45.0	51.5	57.6	10.5
IV	4	42.3	45.1	16.1	19.2	48.7	48.7	42.8	48.2	11.2
V	1	44.1	48.7	29.2	32.5	51.1	58.3	45.9	51.3	10.5
VI	1	68.3	71.3	33.5	36.6	26.9	30.7	39.0	42.9	9.0
VI	2	46.1	49.5	19.5	24.2	30.2	40.6	36.5	43.6	16.2
VI	3	34.5	36.4	30.5	35.1	23.3	24.1	36.0	42.5	15.2
VII	1	35.2	37.7	29.1	32.5	25.1	27.2	40.5	45.9	11.7
VII	2	35.2	38.7	15.0	16.4	19.6	21.2	36.5	40.6	10.1
VII	3	27.6	33.7	8.9	10.1	11.3	11.3	25.3	31.5	19.6

High achievement by a system in computation went with high achievement in solving the problems, the correlation being about .50; and the system that scored high in addition or subtraction or multiplication or division usually showed closely similar excellence in the other three, the correlations being about .90.

TABLE 11

SCORES MADE BY THE SIXTH-GRADE PUPILS OF EACH OF TWENTY-SIX SCHOOL SYSTEMS

SYSTEM	SCORE IN TESTS WITH PROBLEMS	SCORE IN TESTS IN COMPUTING
23	356	1841
24	429	3513
17	444	3042
4	464	3563
25	464	2167
22	468	2311
16	469	3707
20	491	2168
18	509	3758
15	532	2779
3	533	2845

8	538	2747
6	550	3173
1	552	2935
10	601	2749
2	615	2958
21	627	2951
13	636	3049
14	661	3561
9	691	3404
7	734	3782
12	736	3410
11	759	3261
26	791	3682
19	848	4099
5	914	3569

Of the conditions under which arithmetical learning took place, the one most elaborately studied was the amount of time devoted to arithmetic. On the basis of replies by principals of schools to certain questions, he gave each of the twenty-six school systems a measure for the probable time spent on arithmetic up through grade 6. Leaving home study out of account, there seems to be little or no correlation between the amount of time a system devotes to arithmetic and its score in problem-solving, and not much more between time expenditure and score in computation. With home study included there is little relation to the achievement of the system in solving problems, but there is a clear effect on achievement in computation. The facts as given by Stone are:—

TABLE 12

CORRELATION OF TIME EXPENDITURES WITH ABILITIES

Without Home Study	Reasoning and Time Expenditure	-.01
{	Fundamentals and Time	.09
	Expenditure	
Including Home Study	Reasoning and Time Expenditure	.13
{	Fundamentals and Time	.49
	Expenditure	

These correlations, it should be borne in mind, are for school systems, not for individual pupils. It might be that, though the system which devoted the most time to arithmetic did not show corresponding superiority in the product over the system devoting only half as much time, the pupils within the system did achieve in exact proportion to the time they gave to study. Neither correlation would permit inference concerning the effect of different amounts of time spent by the same pupil.

Stone considered also the printed announcements of the courses of study in arithmetic in these twenty-six systems. Nineteen judges rated these announced courses of study for excellence according to the instructions quoted below:—

CONCERNING THE RATING OF COURSES OF STUDY

Judges please read before scoring

I. Some Factors Determining Relative Excellence.

(N. B. The following enumeration is meant to be suggestive rather than complete or exclusive. And each scorer is urged to rely primarily on his own judgment.)

1. Helpfulness to the teacher in teaching the subject matter outlined.
2. Social value or concreteness of sources of problems.
3. The arrangement of subject matter.
4. The provision made for adequate drill.
5. A reasonable minimum requirement with suggestions for valuable additional work.

6. The relative values of any predominating so-called methods—such as Speer, Grube, etc.
7. The place of oral or so-called mental arithmetic.
8. The merit of textbook references.

II. Cautions and Directions.

(Judges please follow as implicitly as possible.)

1. Include references to textbooks as parts of the Course of Study.
This necessitates judging the parts of the texts referred to.
2. As far as possible become equally familiar with all courses before scoring any.
3. When you are ready to begin to score, (1) arrange in serial order according to excellence, (2) starting with the middle one score it 50, then score above and below 50 according as courses are better or poorer, indicating relative differences in excellence by relative differences in scores, *i.e.* in so far as you find that the courses differ by about equal steps, score those better than the middle one 51, 52, etc., and those poorer 49, 48, etc., but if you find that the courses differ by unequal steps show these inequalities by omitting numbers.
4. Write ratings on the slip of paper attached to each course.

The systems whose courses of study were thus rated highest did not manifest any greater achievement in Stone's tests than the rest. The thirteen with the most approved announcements of courses of study were in fact a little inferior in achievement to the other thirteen, and the correlation coefficients were slightly negative.

Stone also compared eighteen systems where there was supervision of the work by superintendents or supervisors as well as by principals with four systems where the principals and teachers had no such help. The scores in his tests were very much lower in the four latter cities.

THE HYGIENE OF THE EYES IN ARITHMETIC

^A 222 523 555 554 646 586 <hr style="width: 100%;"/> <hr style="width: 100%;"/>	^B 354 535 545 333 546 975 <hr style="width: 100%;"/> <hr style="width: 100%;"/>
872 - 196 <hr style="width: 100%;"/> <hr style="width: 100%;"/>	621 - 589 <hr style="width: 100%;"/> <hr style="width: 100%;"/>

FIG. 26.—Type too large.

We have already noted that the task of reading and copying numbers is one of the hardest that the eyes have to perform in the elementary school, and that it should be alleviated by arranging much of the work so that only answers need be written by the pupil. The figures to be read and copied should obviously be in type of suitable size and style, so arranged and spaced on the page or blackboard as to cause a minimum of effort and strain.

0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8	9

FIG. 27.—12-point, 11-point, and 10-point type.

Size.—Type may be too large as well as too small, though the latter is the commoner error. If it is too large, as in Fig. 26, which is a duplicate of type actually used in a form of practice pad, the eye has to make too many fixations to take in a given content. All things considered, 12-point type in

grades 3 and 4, 11-point in grades 5 and 6, and 10-point in grades 7 and 8 seem the most desirable sizes. These are shown in Fig. 27. Too small type occurs oftenest in fractions and in the dimension-numbers or scale numbers of drawings. Figures 28, 29, and 30 are samples from actual school practice. Samples of the desirable size are shown in Figs. 31 and 32. The technique of modern typesetting makes it very difficult and expensive to make fractions of the horizontal type

$$\left(\frac{1}{4} \quad , \quad \frac{3}{8} \quad , \quad \frac{5}{6} \quad \right)$$

large enough without making the whole-number figures with which they are mingled too large or giving an uncouth appearance to the total. Consequently fractions somewhat smaller than are desirable may have to be used occasionally in textbooks.^[19] There is no valid excuse, however, for the excessively small fractions which often are made in blackboard work.

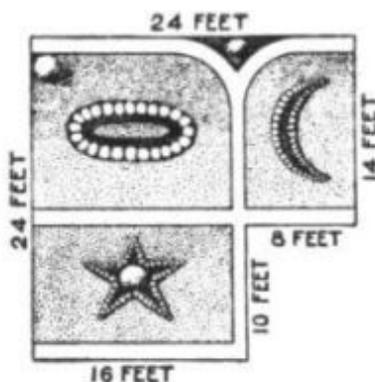


FIG. 28.—Type of measurements too small.

This is a picture of Mary's garden.
How many feet is it around the garden?

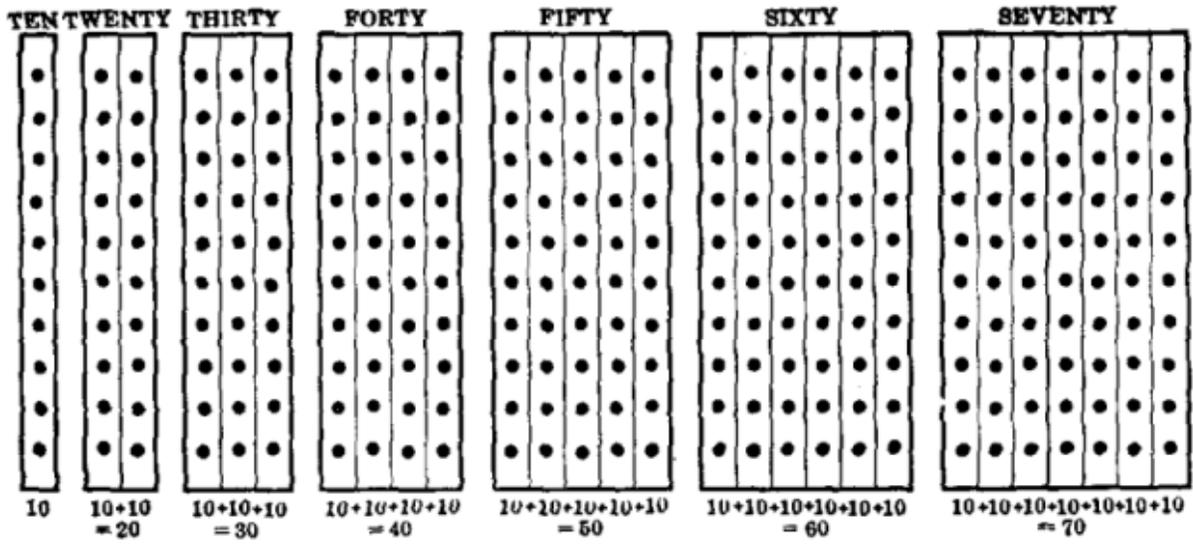


FIG. 29.—Type too small.

Find the area of:

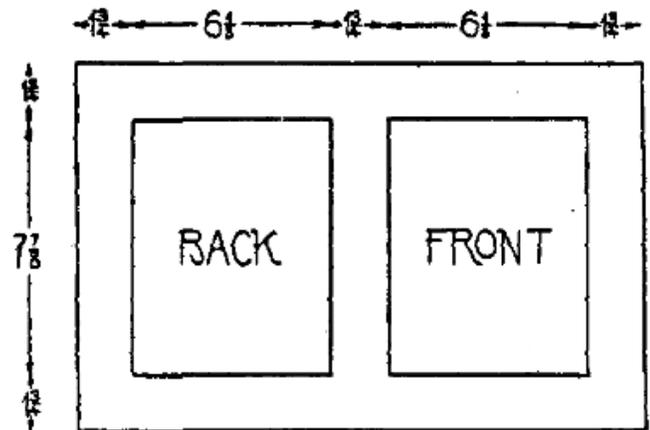
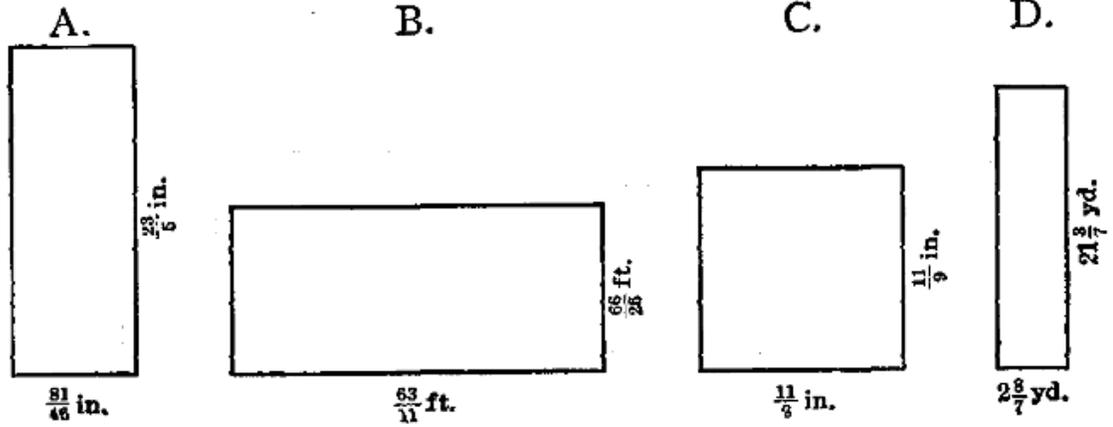


FIG. 30.—Numbers too small and badly designed.

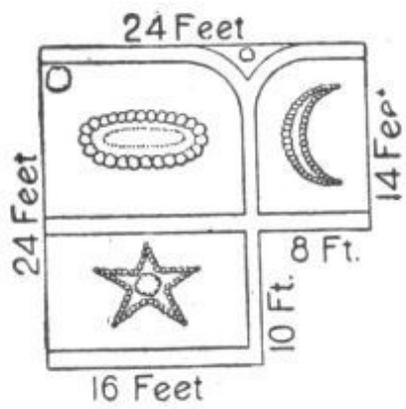


FIG. 31.—Figure 28 with suitable numbers.

Find the area of:

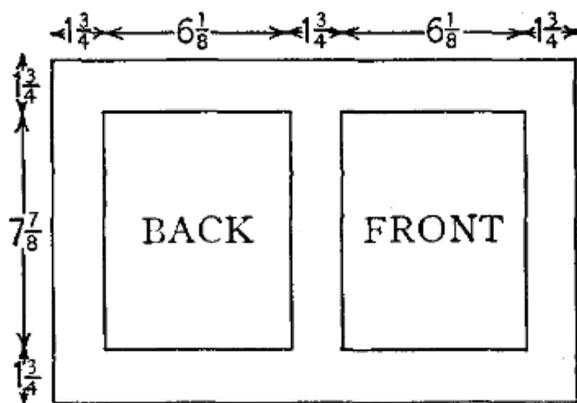
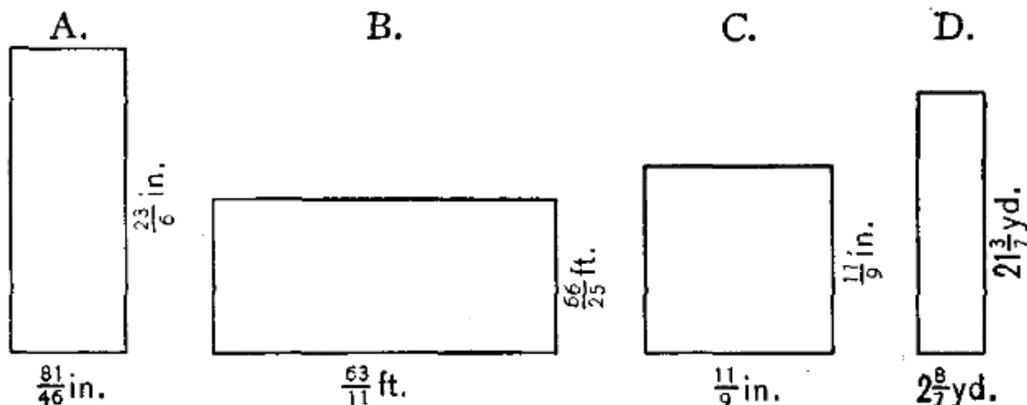


FIG. 32.—Figure 30 with suitable numbers.

Style.—The ordinary type forms often have 3 and 8 so made as to require strain to distinguish them. 5 is sometimes easily confused with 3 and even with 8. 1, 4, and 7 may be less easily distinguishable than is desirable. Figure 33 shows a specially good type in which each figure is represented by its essential^[20] features without any distracting shading or knobs or turns. Figure 34 shows some of the types in common use. There are no demonstrably great differences amongst these. In fractions there is a notable gain from using the slant form ($\frac{2}{3}$, $\frac{3}{4}$) for exercises in addition and subtraction, and for almost all mixed numbers. This appears clearly to the eye in the comparison of Fig. 35 below, where the same fractions all in 10-point type are displayed in horizontal and in slant form. The figures in the slant form are in general larger and the space between them and the fraction-line is wider. Also the slant form makes it easier for the eye to examine the denominators to see whether reductions are necessary. Except for a few

cases to show that the operations can be done just as truly with the horizontal forms, the book and the blackboard should display mixed numbers and fractions to be added or subtracted in the slant form. The slant line should be at an angle of approximately 45 degrees. Pupils should be taught to use this form in their own work of this sort.

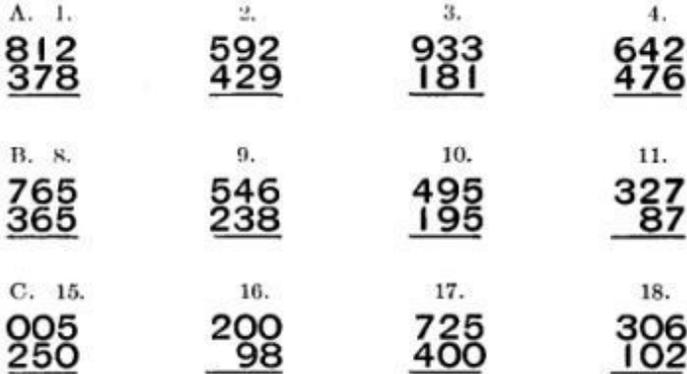


FIG. 33.—Block type; a very desirable type except that it is somewhat too heavy.

1 2 3 4 5 6 7
 1 2 3 4 5 6 7
 1 2 3 4 5 6 7
 1 2 3 4 5 6 7
 1 2 3 4 5 6 7
 1 2 3 4 5 6 7
 1 2 3 4 5 6 7
 1 2 3 4 5 6 7
 1 2 3 4 5 6 7

FIG. 34.—Common styles of printed numbers.

When script figures are presented they should be of simple design, showing clearly the essential features of the figure, the line being everywhere of equal or nearly equal width (that is, without shading, and without ornamentation or eccentricity of any sort). The opening of the 3 should be wide to prevent confusion with 8; the top of the 3 should be curved to aid its differentiation from 5; the down stroke of the 9 should be almost or quite straight; the 1, 4, 7, and 9 should be clearly distinguishable. There are many ways of distinguishing them clearly, the best probably being to use the straight line for 1, the open 4 with clear angularity, a wide top to the 7, and a clearly closed curve for the top of the 9.

$19\frac{3}{4}$	$19\frac{3}{4}$	$6\frac{1}{3}$	$6\frac{1}{3}$
$21\frac{1}{2}$	$1\frac{1}{2}$	$9\frac{1}{2}$	$9\frac{1}{2}$
$15\frac{5}{8}$	$15\frac{5}{8}$	$3\frac{2}{3}$	$3\frac{2}{3}$
<u>$17\frac{3}{8}$</u>	<u>$17\frac{3}{8}$</u>	<u>$8\frac{1}{2}$</u>	<u>$8\frac{1}{2}$</u>

FIG. 35.—Diagonal and horizontal fractions compared.

\$1.10	\$1.10
2.85	\$2.85
3.75	\$3.75
6.42	\$6.42
1.49	\$1.49
2.25	\$2.25
7.50	\$7.50
\$25.36	\$25.36

<i>A</i>	<i>B</i>	<i>A</i>	<i>B</i>
$\frac{1}{2}$ of 6 =	$\frac{1}{3}$ of 27 =	$\frac{1}{2}$ of 6 =	$\frac{1}{3}$ of 27 =
$\frac{1}{2}$ of 10 =	$\frac{1}{2}$ of 18 =	$\frac{1}{2}$ of 10 =	$\frac{1}{2}$ of 18 =
$\frac{1}{2}$ of 8 =	$\frac{1}{3}$ of 18 =	$\frac{1}{2}$ of 8 =	$\frac{1}{3}$ of 18 =
$\frac{1}{3}$ of 12 =	$\frac{1}{6}$ of 12 =	$\frac{1}{3}$ of 12 =	$\frac{1}{6}$ of 12 =
$\frac{1}{3}$ of 15 =	$\frac{1}{2}$ of 16 =	$\frac{1}{3}$ of 15 =	$\frac{1}{2}$ of 16 =
$\frac{1}{4}$ of 8 =	$\frac{1}{2}$ of 14 =	$\frac{1}{4}$ of 8 =	$\frac{1}{2}$ of 14 =
$\frac{1}{4}$ of 40 =	$\frac{1}{9}$ of 18 =	$\frac{1}{4}$ of 40 =	$\frac{1}{9}$ of 18 =
$\frac{1}{5}$ of 40 =	$\frac{1}{4}$ of 36 =	$\frac{1}{5}$ of 40 =	$\frac{1}{4}$ of 36 =
$\frac{1}{6}$ of 18 =	$\frac{1}{4}$ of 32 =	$\frac{1}{6}$ of 18 =	$\frac{1}{4}$ of 32 =
$\frac{1}{8}$ of 56 =	$\frac{1}{7}$ of 35 =	$\frac{1}{8}$ of 56 =	$\frac{1}{7}$ of 35 =
<i>F</i>		<i>F</i>	
$\frac{2}{3}$ of 9 =	$\frac{4}{5}$ of 20 =	$\frac{2}{3}$ of 9 =	$\frac{4}{5}$ of 20 =
$\frac{3}{4}$ of 16 =	$\frac{3}{5}$ of 20 =	$\frac{3}{4}$ of 16 =	$\frac{3}{5}$ of 20 =
$\frac{2}{5}$ of 20 =	$\frac{2}{3}$ of 15 =	$\frac{2}{5}$ of 20 =	$\frac{2}{3}$ of 15 =
<i>G</i>		<i>G</i>	
$\frac{1}{2} + \frac{1}{2} =$	$\frac{3}{5} + \frac{2}{5} =$	$\frac{1}{2} + \frac{1}{2} =$	$\frac{3}{5} + \frac{2}{5} =$
$1\frac{1}{2} + \frac{1}{2} =$	$\frac{3}{4} + \frac{1}{4} =$	$1\frac{1}{2} + \frac{1}{2} =$	$\frac{3}{4} + \frac{1}{4} =$
$\frac{3}{4} + \frac{3}{4} =$	$\frac{2}{3} + \frac{2}{3} =$	$\frac{3}{4} + \frac{3}{4} =$	$\frac{2}{3} + \frac{2}{3} =$
$2\frac{3}{4} + \frac{3}{4} =$	$1\frac{1}{3} + \frac{2}{3} =$	$2\frac{3}{4} + \frac{3}{4} =$	$1\frac{1}{3} + \frac{2}{3} =$

FIG. 36.—Good vertical spacing.

FIG. 37.—Bad vertical spacing.

Find, without pencil, the loss or gain.

	COST	RATE OF PROFIT OR LOSS		COST	RATE OF PROFIT OR LOSS		COST	RATE OF PROFIT OR LOSS
1.	\$3000	20%	13.	\$3200	12½%	25.	\$900	25%
2.	7300	10%	14.	4000	62½%	26.	800	12½%
3.	4500	40%	15.	2700	66⅔%	27.	450	20%
4.	250	30%	16.	1600	15%	28.	600	30%
5.	3600	33⅓%	17.	7200	25%	29.	1600	25%
6.	2400	37½%	18.	8500	50%	30.	950	10%
7.	4800	12½%	19.	4200	16⅔%	31.	2200	20%
8.	6000	8⅓%	20.	150	3%	32.	2500	8%
9.	1600	6¼%	21.	7500	10%	33.	10,000	12½%
10.	1800	16⅔%	22.	3500	20%	34.	160	12½%
11.	2000	2½%	23.	1800	25%	35.	1500	20%
12.	4500	66⅔%	24.	4200	16⅔%	36.	4000	37½%

	COST	RATE OF PROFIT OR LOSS		COST	RATE OF PROFIT OR LOSS		COST	RATE OF PROFIT OR LOSS
1.	\$3000	20%	13.	\$3200	12½%	25.	\$900	25%
2.	7300	10%	14.	4000	62½%	26.	800	12½%
3.	4500	40%	15.	2700	66⅔%	27.	450	20%
4.	250	30%	16.	1600	15%	28.	600	30%
5.	3600	33⅓%	17.	7200	25%	29.	1600	25%
6.	2400	37½%	18.	8500	50%	30.	950	10%
7.	4800	12½%	19.	4200	16⅔%	31.	2200	20%
8.	6000	8⅓%	20.	150	3%	32.	2500	8%
9.	1600	6¼%	21.	7500	10%	33.	10,000	12½%
10.	1800	16⅔%	22.	3500	20%	34.	160	12½%
11.	2000	2½%	23.	1800	25%	35.	1500	20%
12.	4500	66⅔%	24.	4200	16⅔%	36.	4000	37½%

FIGS. 38 (above) and 39 (below).—Good and bad left-right spacing.

The pupil's writing of figures should be clear. He will thereby be saved eyestrain and errors in his school work as well as given a valuable ability for life. Handwriting of figures is used enormously in spite of the development of typewriters; illegible figures are commonly more harmful than illegible letters or words, since the context far less often tells what the figure is intended to be; the habit of making clear figures is not so hard to acquire, since they are written unjoined and require only the automatic action of ten minor acts of skill. The schools have missed a great opportunity in this respect. Whereas the hand writing of words is often better than it needs to be

for life's purposes, the writing of figures is usually much worse. The figures presented in books on penmanship are also commonly bad, showing neglect or misunderstanding of the matter on the part of leaders in penmanship.

Spacing.—Spacing up and down the column is rarely too wide, but very often too narrow. The specimens shown in Figs. 36 and 37 show good practice contrasted with the common fault.

Spacing from right to left is generally fairly satisfactory in books, though there is a bad tendency to adopt some one routine throughout and so to miss chances to use reductions and increases of spacing so as to help the eye and the mind in special cases. Specimens of good and bad spacing are shown in Figs. 38 and 39. In the work of the pupils, the spacing from right to left is often too narrow. This crowding of letters, together with unevenness of spacing, adds notably to the task of eye and mind.

The composition or make-up of the page.—Other things being equal, that arrangement of the page is best which helps a child most to keep his place on a page and to find it after having looked away to work on the paper on which he computes, or for other good reasons. A good page and a bad page in this respect are shown in Figs. 40 and 41.

Suppose that you are a clerk selling butter and cheese at these prices. Find the cost of each purchase.

Butter		Cheese	
<i>Standard Creamery</i>	24¢ per pound	<i>Cottage</i>	16¢ per pound
<i>Oak Farm</i>	30¢ " "	<i>Full Cream</i>	22¢ " "
<i>Cedar Farm Special</i>	34¢ " "	<i>Old English</i>	32¢ " "
<i>XX Unsalted</i>	45¢ " "	<i>Swiss</i>	38¢ " "

- | | |
|---|---|
| 1. $\frac{3}{4}$ lb. Oak Farm butter. | 26. $2\frac{1}{4}$ lb. Cedar Farm butter. |
| 2. $1\frac{3}{4}$ lb. Oak Farm butter. | 27. $\frac{7}{8}$ lb. Full cream cheese. |
| 3. $\frac{3}{8}$ lb. Cottage cheese. | 28. $1\frac{3}{16}$ lb. Old English. |
| 4. $\frac{3}{16}$ lb. Old English cheese. | 29. $\frac{3}{4}$ lb. Full cream cheese. |
| 5. $\frac{5}{16}$ lb. Old English cheese. | 30. $1\frac{5}{16}$ lb. Swiss cheese. |
| 6. $\frac{1}{2}$ lb. Swiss cheese. | 31. $3\frac{7}{16}$ lb. Old English cheese. |
| 7. $\frac{1}{4}$ lb. Swiss cheese. | 32. $1\frac{1}{8}$ lb. Standard creamery. |
| 8. $\frac{5}{16}$ lb. Swiss cheese. | 33. $2\frac{5}{16}$ lb. Oak Farm butter. |
| 9. $\frac{7}{16}$ lb. Oak Farm butter. | 34. $1\frac{3}{4}$ lb. Cedar Farm butter. |
| 10. $1\frac{3}{16}$ lb. Oak Farm butter. | 35. $2\frac{5}{16}$ lb. Old English cheese. |
| 11. $1\frac{3}{16}$ lb. Swiss cheese. | 36. $\frac{9}{16}$ lb. Unsalted butter. |
| 12. $2\frac{1}{4}$ lb. Cedar Farm butter. | 37. 23 oz. Cottage cheese. |
| 13. $\frac{3}{8}$ lb. Unsalted butter. | 38. 1 lb. 7 oz. Oak Farm butter. |
| 14. $\frac{19}{16}$ lb. Old English cheese. | 39. 2 lb. 3 oz. Old English. |
| 15. 4 lb. Standard creamery. | 40. 1 lb. 5 oz. Swiss cheese. |
| 16. $1\frac{1}{16}$ lb. Swiss cheese. | 41. 1 lb. 5 oz. Old English. |
| 17. $\frac{11}{8}$ lb. Swiss cheese. | 42. 1 lb. 1 oz. Swiss cheese. |
| 18. $\frac{9}{16}$ lb. Oak Farm butter. | 43. 9 oz. Swiss cheese. |
| 19. $1\frac{1}{8}$ lb. Full cream cheese. | 44. 1 lb. 5 oz. Oak Farm. |
| 20. $3\frac{1}{2}$ lb. Full cream cheese. | 45. 5 oz. Unsalted butter. |
| 21. $1\frac{3}{16}$ lb. Cottage cheese. | 46. 11 oz. Swiss cheese. |
| 22. $2\frac{3}{4}$ lb. Cedar Farm butter. | 47. 20 oz. Cottage cheese. |
| 23. 6 lb. Standard creamery. | 48. 1 lb. 6 oz. Oak Farm. |
| 24. $\frac{11}{8}$ lb. Old English cheese. | 49. 10 oz. Unsalted butter. |
| 25. $1\frac{5}{16}$ lb. Old English cheese. | 50. 2 lb. 4 oz. Old English. |

FIG. 40.—A page well made up to suit the action of the eye.

Suppose that you are a clerk selling butter and cheese at these prices. Find the cost of each purchase.

Butter:— Standard Creamery, 24¢ per pound; Oak Farm, 30¢ per pound; Cedar Farm Special, 34¢ per pound; XX Unsalted, 45¢ per pound. Cheese:— Cottage, 16¢ per pound; Full Cream, 22¢ per pound; Old English, 32¢ per pound; Swiss, 38¢ per pound.

1. $\frac{3}{4}$ lb. Oak Farm butter. 2. $1\frac{3}{4}$ lb. Oak Farm butter. 3. $\frac{3}{8}$ lb. Cottage cheese. 4. $\frac{3}{16}$ lb. Old English cheese. 5. $\frac{5}{16}$ lb. Old English cheese. 6. $\frac{1}{2}$ lb. Swiss cheese. 7. $\frac{1}{4}$ lb. Swiss cheese. 8. $\frac{5}{16}$ lb. Swiss cheese. 9. $\frac{7}{16}$ lb. Oak Farm butter. 10. $1\frac{3}{16}$ lb. Oak Farm butter. 11. $1\frac{3}{16}$ lb. Swiss cheese. 12. $2\frac{1}{4}$ lb. Cedar Farm butter. 13. $\frac{9}{16}$ lb. Unsalted butter. 14. $\frac{9}{16}$ lb. Old English cheese. 15. 4 lb. Standard creamery. 16. $1\frac{1}{16}$ lb. Swiss cheese. 17. $\frac{1}{8}$ lb. Swiss cheese. 18. $\frac{9}{16}$ lb. Oak Farm butter. 19. $1\frac{1}{8}$ lb. Full cream cheese. 20. $3\frac{1}{2}$ lb. Full cream cheese. 21. $1\frac{3}{16}$ lb. Cottage cheese. 22. $2\frac{3}{4}$ lb. Cedar Farm butter. 23. 6 lb. Standard creamery. 24. $\frac{1}{8}$ lb. Old English cheese. 25. $1\frac{5}{16}$ lb. Old English cheese. 26. $2\frac{1}{4}$ lb. Cedar Farm butter. 27. $\frac{7}{8}$ lb. Full cream cheese. 28. $1\frac{3}{16}$ lb. Old English. 29. $\frac{3}{4}$ lb. Full cream cheese. 30. $1\frac{5}{16}$ lb. Swiss cheese. 31. $3\frac{7}{16}$ lb. Old English cheese. 32. $1\frac{1}{8}$ lb. Standard creamery. 33. $2\frac{5}{16}$ lb. Oak Farm butter. 34. $1\frac{3}{4}$ lb. Cedar Farm butter. 35. $2\frac{5}{16}$ lb. Old English cheese. 36. $\frac{9}{16}$ lb. Unsalted butter. 37. 23 oz. Cottage cheese. 38. 1 lb. 7 oz. Oak Farm butter. 39. 2 lb. 3 oz. Old English. 40. 1 lb. 5 oz. Swiss cheese. 41. 1 lb. 5 oz. Old English. 42. 1 lb. 1 oz. Swiss cheese. 43. 9 oz. Swiss cheese. 44. 1 lb. 5 oz. Oak Farm. 45. 5 oz. Unsalted butter. 46. 11 oz. Swiss cheese. 47. 20 oz. Cottage cheese. 48. 1 lb. 6 oz. Oak Farm. 49. 10 oz. Unsalted butter. 50. 2 lb. 4 oz. Old English.

FIG. 41.—The same matter as in Fig. 40, much less well made up.

Objective presentations.—Pictures, diagrams, maps, and other presentations should not tax the eye unduly,

- (a) by requiring too fine distinctions, or
- (b) by inconvenient arrangement of the data, preventing easy counting, measuring, comparison, or whatever the task is, or
- (c) by putting too many facts in one picture so that the eye and mind, when trying to make out any one, are confused by the others.

Illustrations of bad practices in these respects are shown in Figs. 42 to 52. A few specimens of work well arranged for the eye are shown in Figs. 53 to 56.

Good rules to remember are:—

Other things being equal, make distinctions by the clearest method, fit material to the tendency of the eye to see an 'eyeful' at a time (roughly $1\frac{1}{2}$ inch by $\frac{1}{2}$ inch in a book; $1\frac{1}{2}$ ft. by $\frac{1}{2}$ ft. on the blackboard), and let one picture teach only one fact or relation, or such facts and relations as do not interfere in perception.

The general conditions of seating, illumination, paper, and the like are even more important when the eyes are used with numbers than when they are used with words.



FIG. 42.—Try to count the rungs on the ladder, or the shocks in the wagon.

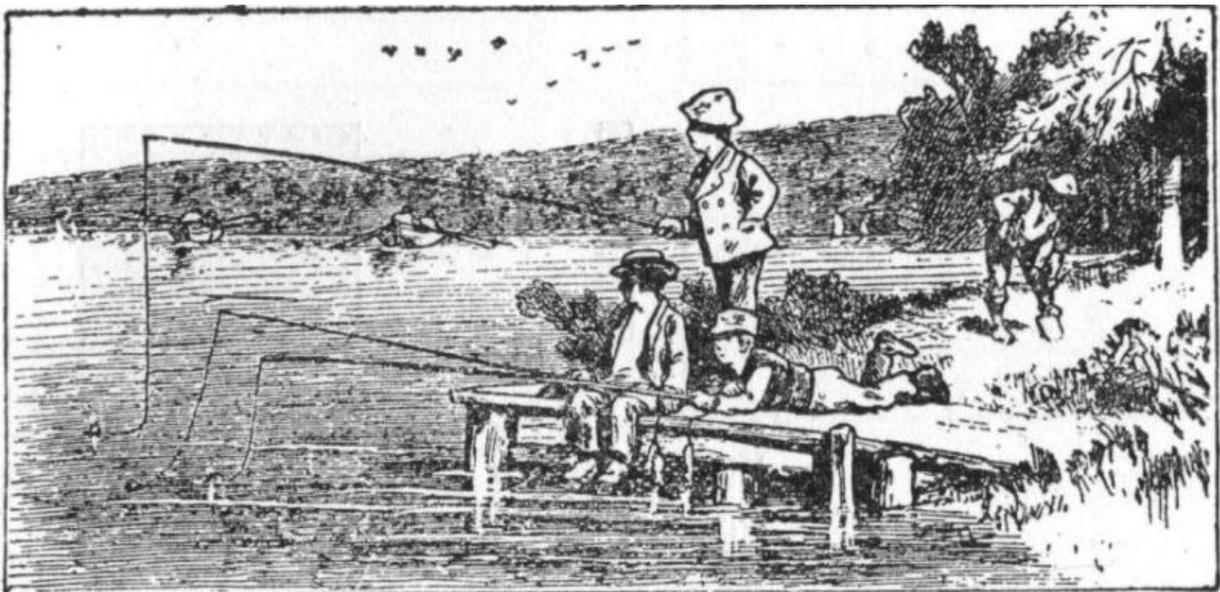


FIG. 43.—How many oars do you see? How many birds? How many fish?



FIG. 44.—Count the birds in each of the three flocks of birds.

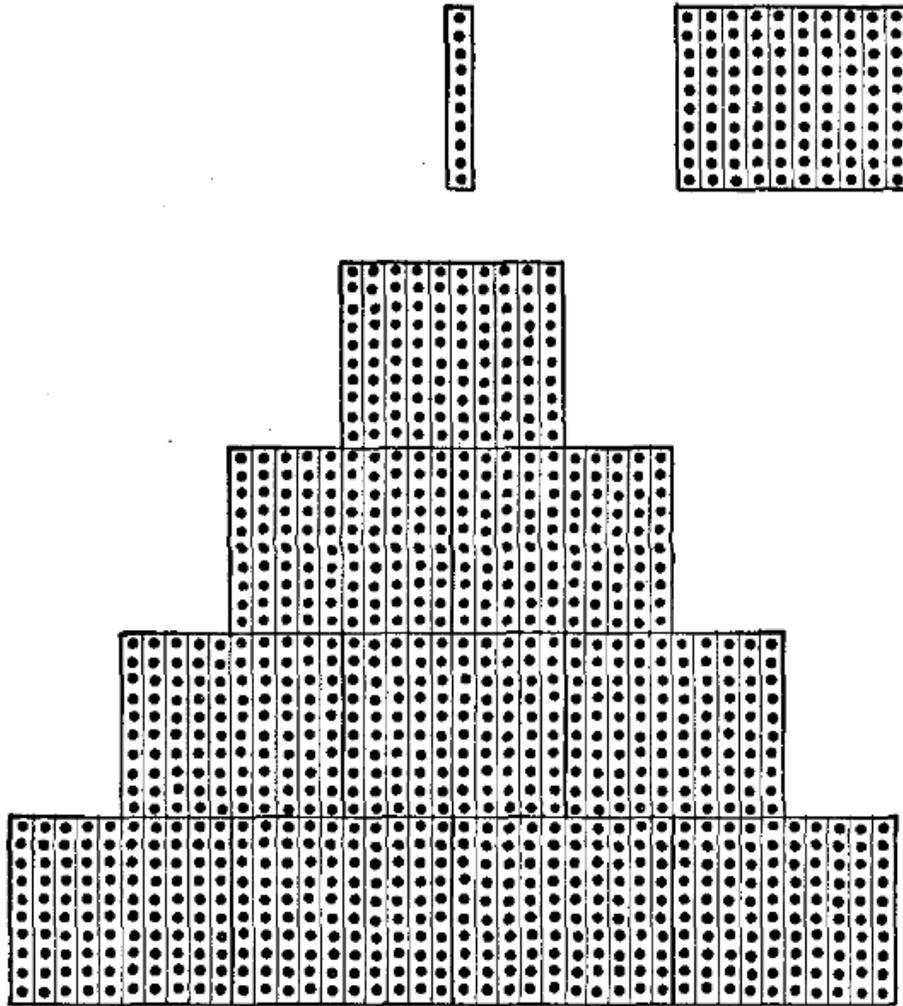


FIG. 45.—Note the lack of clear division of the hundreds. Consider the difficulty of counting one of these columns of dots.

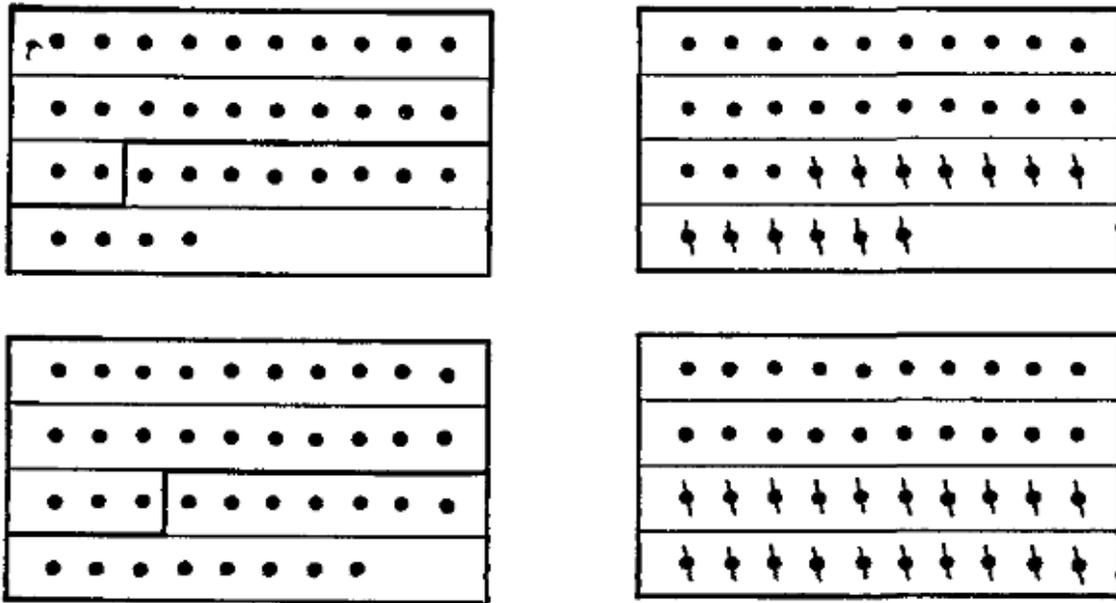


FIG. 46.—What do you suppose these pictures are intended to show?

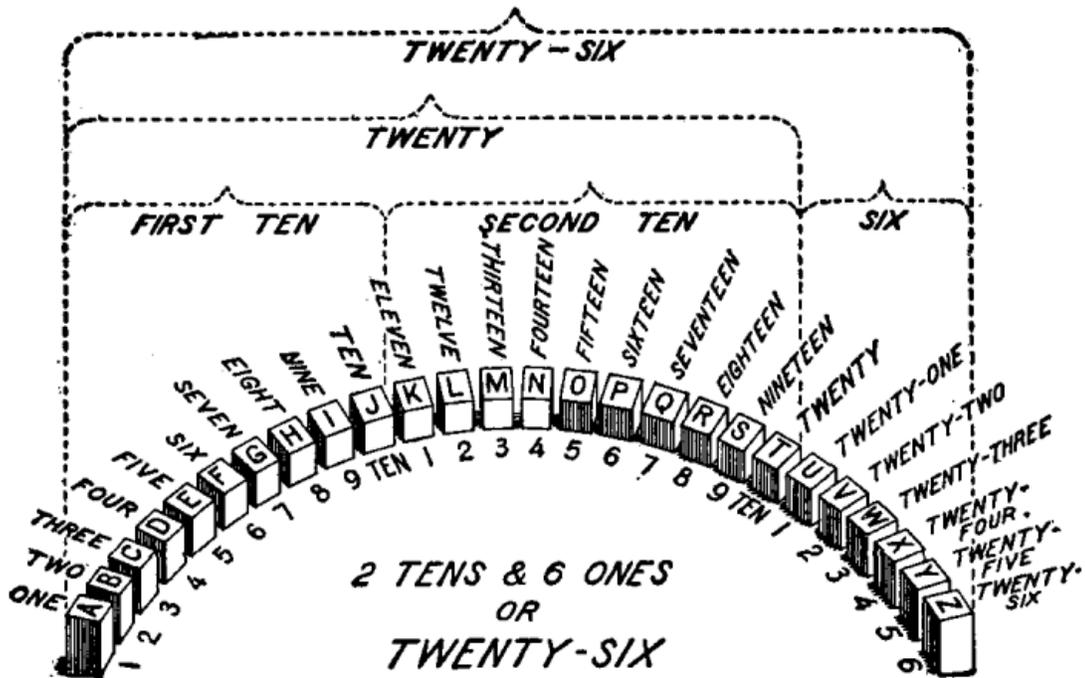


FIG. 47.—Would a beginner know that after THIRTEEN he was to switch around and begin at the other end? Could you read the SIX of TWENTY-SIX if you did not already know what it ought to be? What meaning would all the brackets have for a little child in grade 2? Does this picture illustrate or obfuscate?

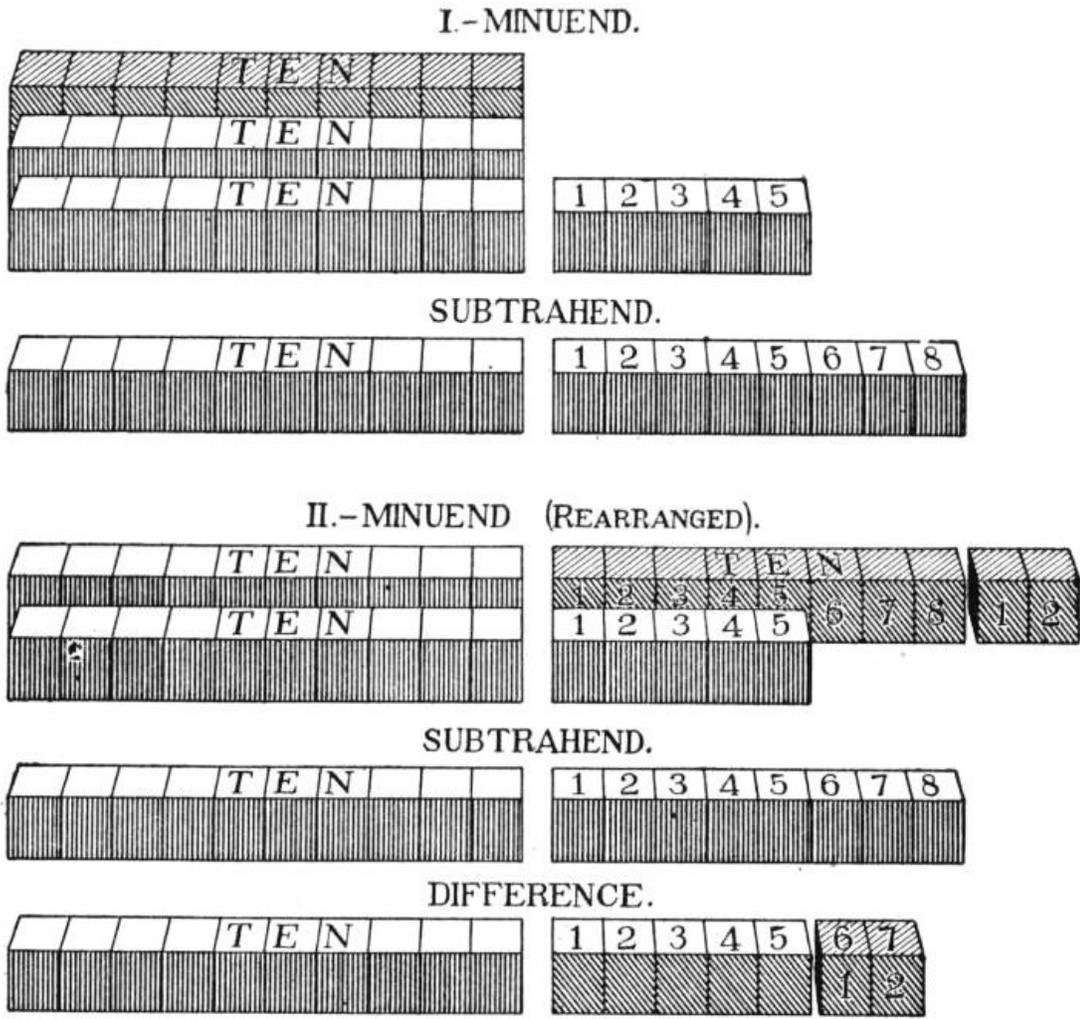
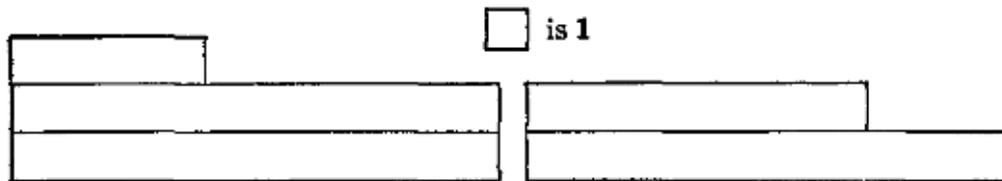


FIG. 48.—How long did it take you to find out what these pictures mean?



FIG. 49.—Count the figures in the first row, using your eyes alone; have some one make lines of 10, 11, 12, 13, and more repetitions of this figure spaced closely as here. Count 20 or 30 such lines, using the eye unaided by fingers, pencil, etc.



These oblongs show what numbers?

FIG. 50.—Can you answer the question without measuring? Could a child of seven or eight?

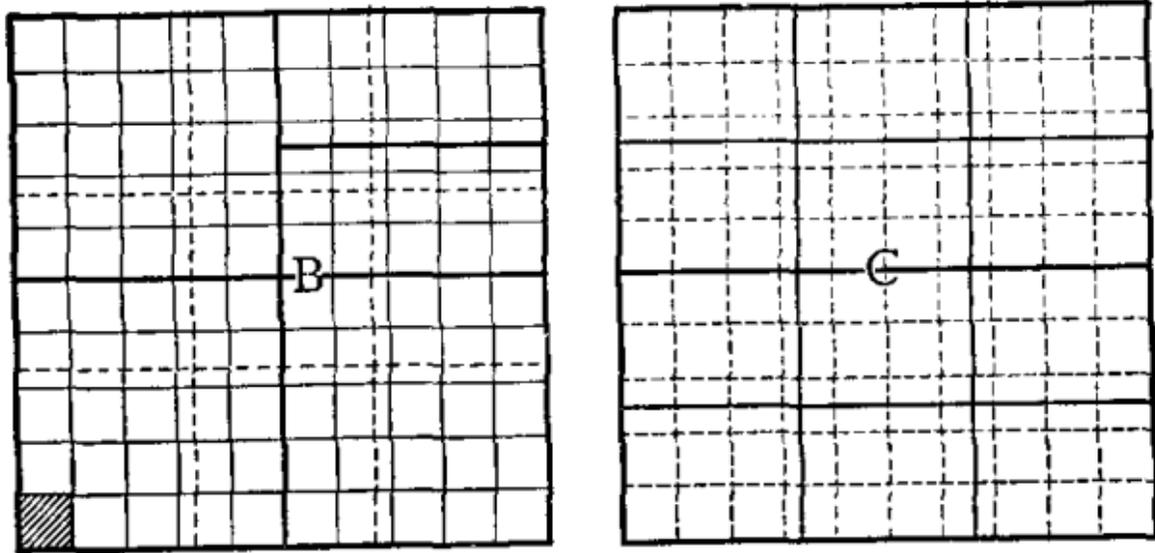


FIG. 51.—What are these drawings intended to show? Why do they show the facts only obscurely and dubiously?

1.

2.

FIG. 52.—What are these drawings intended to show? What simple change would make them show the facts much more clearly?

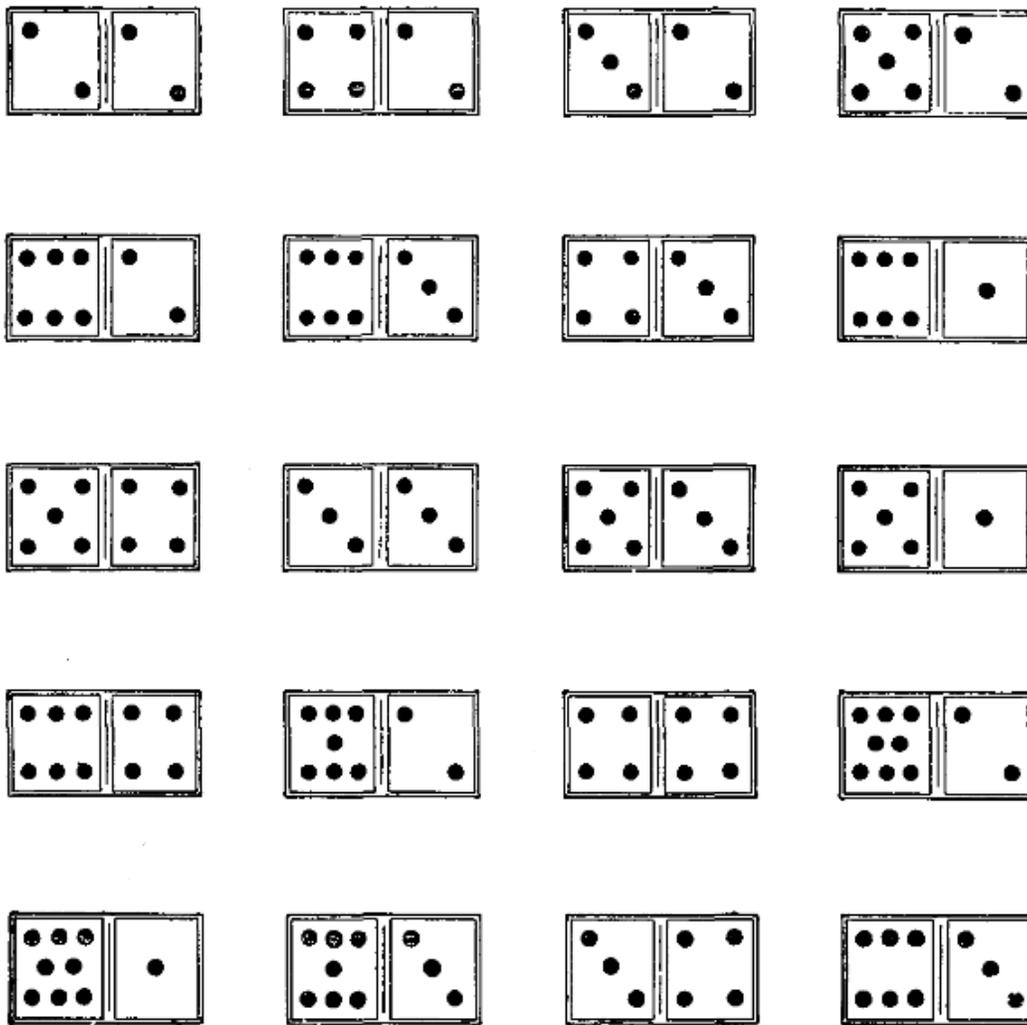


FIG. 53.—Arranged in convenient "eye-fulls."

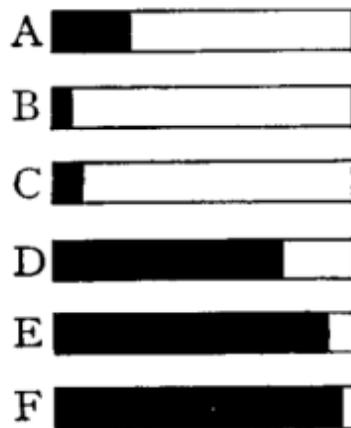


FIG. 54.—Clear, simple, and easy of comparison.

Tell which bar has—

1. About 5 percent of its length black.
2. About 10 percent of its length black.
3. About 25 percent of its length black.
4. About 75 percent of its length black.
5. About 90 percent of its length black.
6. About 95 percent of its length black.

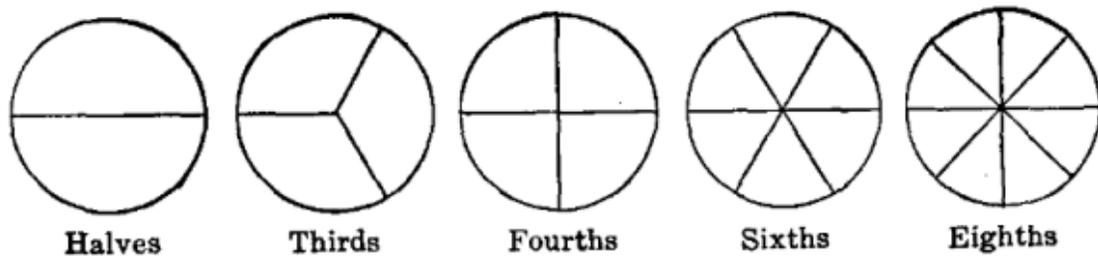


FIG. 55.—Clear, simple, and well spaced.

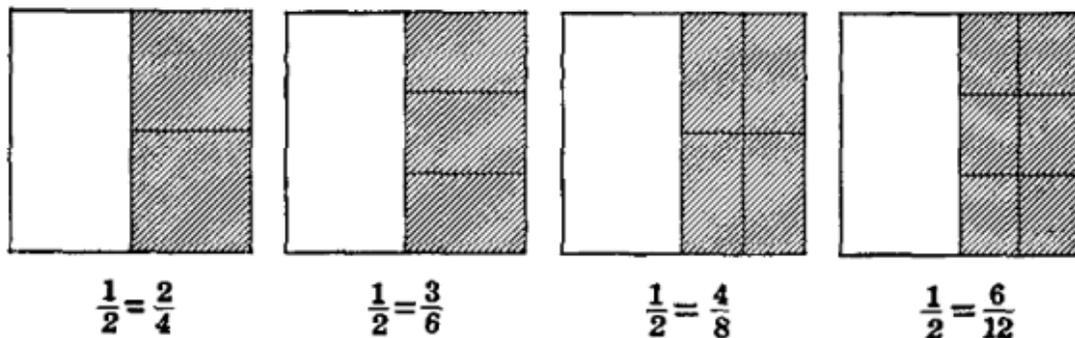


FIG. 56.—Well arranged, though a little wider spacing between the squares would make it even better.

THE USE OF CONCRETE OBJECTS IN ARITHMETIC

We mean by concrete objects actual things, events, and relations presented to sense, in contrast to words and numbers and symbols which mean or stand for these objects or for more abstract qualities and relations. Blocks, tooth-picks, coins, foot rules, squared paper, quart measures, bank books, and checks are such concrete things. A foot rule put successively along the three thirds of a yard rule, a bell rung five times, and a pound weight balancing sixteen ounce weights are such concrete events. A pint beside a quart, an inch beside a foot, an apple shown cut in halves display such concrete relations to a pupil who is attentive to the issue.

Concrete presentations are obviously useful in arithmetic to teach meanings under the general law that a word or number or sign or symbol acquires meaning by being connected with actual things, events, qualities, and relations. We have also noted their usefulness as means to verifying the results of thinking and computing, as when a pupil, having solved, "How many badges each 5 inches long can be made from $3\frac{1}{3}$ yd. of ribbon?" by using $10 \times \frac{12}{5}$, draws a line $3\frac{1}{3}$ yd. long and divides it into 5-inch lengths.

Concrete experiences are useful whenever the meaning of a number, like 9 or $\frac{7}{8}$ or .004, or of an operation, like multiplying or dividing or cubing, or of some term, like rectangle or hypotenuse or discount, or some procedure, like voting or insuring property against fire or borrowing money from a bank, is absent or incomplete or faulty. Concrete work thus is by no means confined to the primary grades but may be appropriate at all stages when new facts, relations, and procedures are to be taught.

How much concrete material shall be presented will depend upon the fact or relation or procedure which is to be made intelligible, and the ability and knowledge of the pupil. Thus 'one half' will in general require less concrete illustration than 'five sixths'; and five sixths will require less in the case of a bright child who already knows $\frac{2}{3}$, $\frac{3}{4}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$, $\frac{2}{5}$, $\frac{3}{5}$, and $\frac{4}{5}$ than in the case of a dull child or one who only knows $\frac{2}{3}$ and $\frac{3}{4}$. As a general rule the same topic will require less concrete material the later it appears in the school course. If the meanings of the numbers are taught in grade 2 instead of grade 1, there will be less need of blocks, counters, splints, beans, and the

like. If $1\frac{1}{2} + \frac{1}{2} = 2$ is taught early in grade 3, there will be more gain from the use of $1\frac{1}{2}$ inches and $\frac{1}{2}$ inch on the foot rule than if the same relations were taught in connection with the general addition of like fractions late in grade 4. Sometimes the understanding can be had either by connecting the idea with the reality directly, or by connecting the two indirectly *via* some other idea. The amount of concrete material to be used will depend on its relative advantage per unit of time spent. Thus it might be more economical to connect $\frac{5}{12}$, $\frac{7}{12}$, and $1\frac{1}{12}$ with real meanings indirectly by calling up the resemblance to the $\frac{2}{3}$, $\frac{3}{4}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{7}{8}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, and $\frac{5}{6}$ already studied, than by showing $\frac{5}{12}$ of an apple, $\frac{7}{12}$ of a yard, $1\frac{1}{12}$ of a foot, and the like.

In general the economical course is to test the understanding of the matter from time to time, using more concrete material if it is needed, but being careful to encourage pupils to proceed to the abstract ideas and general principles as fast as they can. It is wearisome and debauching to pupils' intellects for them to be put through elaborate concrete experiences to get a meaning which they could have got themselves by pure thought. We should also remember that the new idea, say of the meaning of decimal fractions, will be improved and clarified by using it (see page 183 f.), so that the attainment of a *perfect* conception of decimal fractions before doing anything with them is unnecessary and probably very wasteful.

A few illustrations may make these principles more instructive.

(a) Very large numbers, such as 1000, 10,000, 100,000, and 1,000,000, need more concrete aids than are commonly given. Guessing contests about the value in dollars of the school building and other buildings, the area of the schoolroom floor and other surfaces in square inches, the number of minutes in a week, and year, and the like, together with proper computations and measurements, are very useful to reënforce the concrete presentations and supply genuine problems in multiplication and subtraction with large numbers.

(b) Numbers very much smaller than one, such as $\frac{1}{32}$, $\frac{1}{64}$, .04, and .002, also need some concrete aids. A diagram like that of Fig. 57 is useful.

(c) *Majority* and *plurality* should be understood by every citizen. They can be understood without concrete aid, but an actual vote is well worth while

for the gain in vividness and surety.

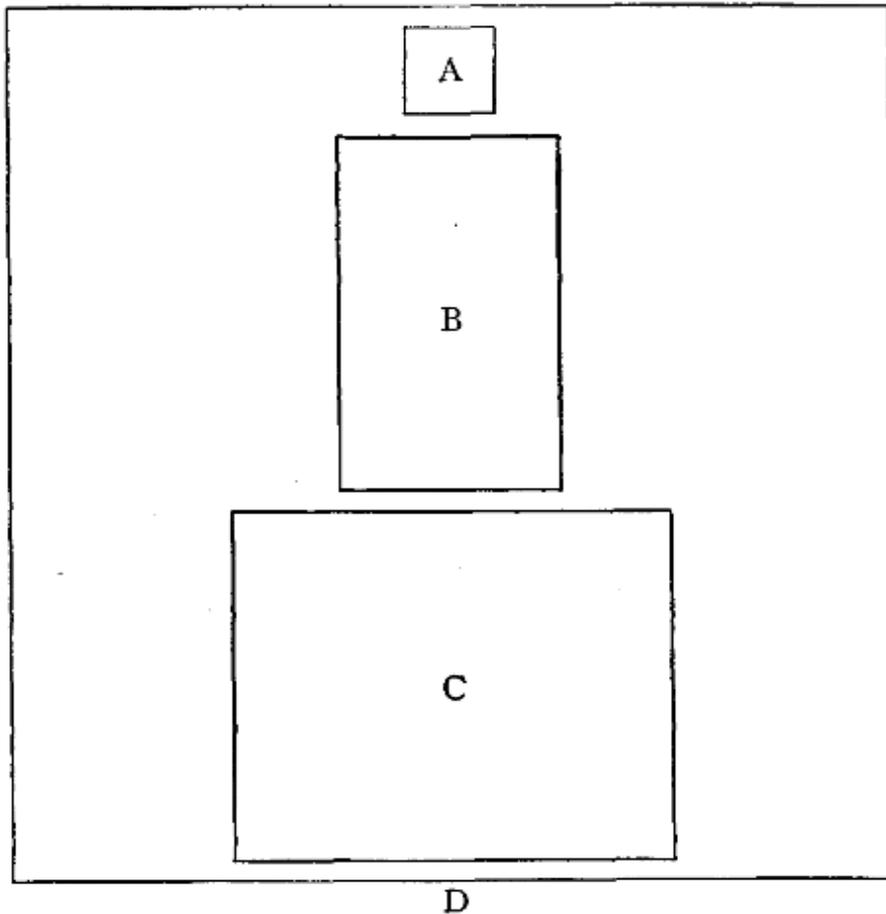


FIG. 57.—Concrete aid to understanding fractions with large denominators.

A = $\frac{1}{1000}$ sq. ft.; B = $\frac{1}{100}$ sq. ft.; C = $\frac{1}{50}$ sq. ft.; D = $\frac{1}{10}$ sq. ft.

(d) Insurance against loss by fire can be taught by explanation and analogy alone, but it will be economical to have some actual insuring and payment of premiums and a genuine loss which is reimbursed.

(e) Four play banks in the corners of the room, receiving deposits, cashing checks, and later discounting notes will give good educational value for the time spent.

(f) Trade discount, on the contrary, hardly requires more concrete illustration than is found in the very problems to which it is applied.

(g) The process of finding the number of square units in a rectangle by multiplying with the appropriate numbers representing length and width is probably rather hindered than helped by the ordinary objective presentation as an introduction. The usual form of objective introduction is as follows:—

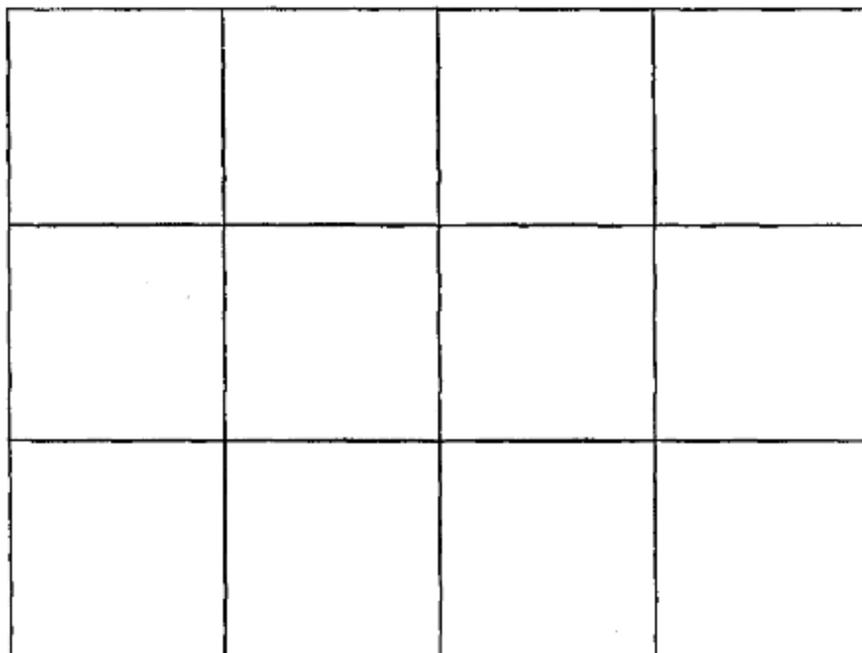


FIG. 58.

How long is this rectangle? How large is each square? How many square inches are there in the top row? How many rows are there? How many square inches are there in the whole rectangle? Since there are three rows each containing 4 square inches, we have 3×4 square inches = 12 square inches.

Draw a rectangle 7 inches long and 2 inches wide. If you divide it into inch squares how many rows will there be? How many inch squares will there be in each row? How many square inches are there in the rectangle?

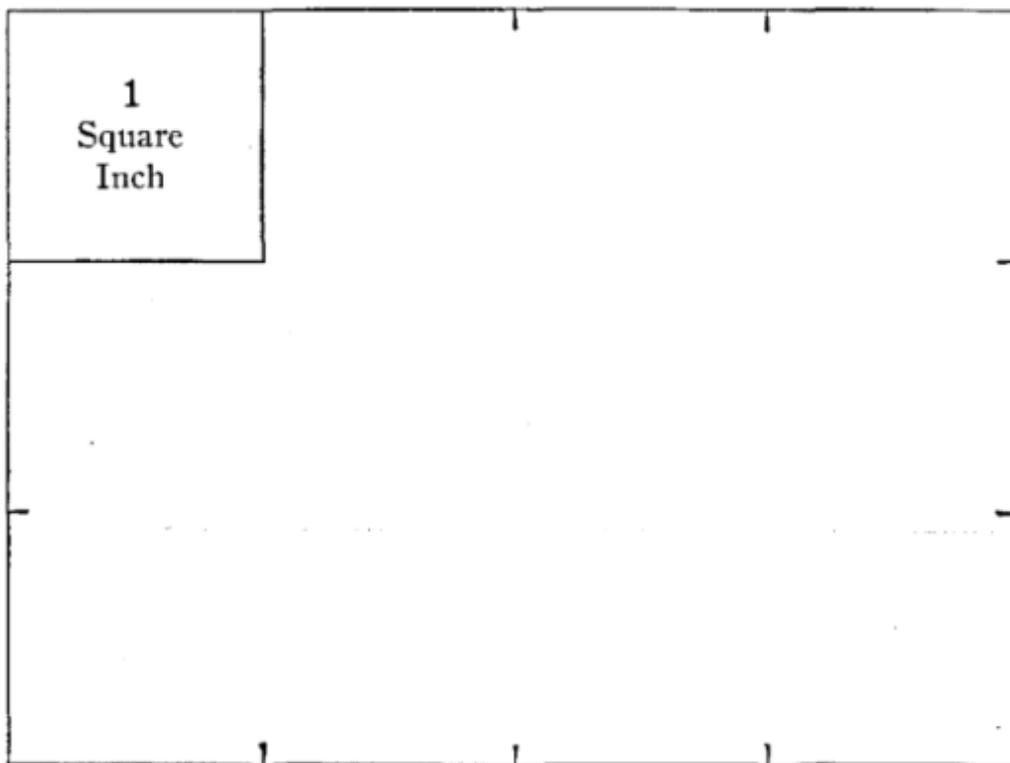


FIG. 59.

It is better actually to hide the individual square units as in Fig. 59. There are four reasons: (1) The concrete rows and columns rather distract attention from the essential thing to be learned. This is not that "x rows one square wide, y squares in a row will make xy squares in all," but that "by using proper units and the proper operation the area of any rectangle can be found from its length and width." (2) Children have little difficulty in learning to multiply rather than add, subtract, or divide when computing area. (3) The habit so formed holds good for areas like $1\frac{2}{3}$ by $4\frac{1}{2}$, with fractional dimensions, in which any effort to count up the areas of rows is very troublesome and confusing. (4) The notion that a square inch is an area 1' by 1' rather than $\frac{1}{2}$ ' by 2' or $\frac{1}{3}$ in. by 3 in. or $1\frac{1}{2}$ in. by $\frac{2}{3}$ in. is likely to be formed too emphatically if much time is spent upon the sort of concrete presentation shown above. It is then better to use concrete counting of rows of small areas as a means of *verification after* the procedure is learned, than as a means of deriving it.

There has been, especially in Germany, much argument concerning what sort of number-pictures (that is, arrangement of dots, lines, or the like, as

shown in Fig. 60) is best for use in connection with the number names in the early years of the teaching of arithmetic.

Lay ['98 and '07], Walsemann ['07], Freeman ['10], Howell ['14], and others have measured the accuracy of children in estimating the number of dots in arrangements of one or more of these different types.^[21] Many writers interpret a difference in favor of estimating, say, the square arrangements of Born or Lay as meaning that such is the best arrangement to use in teaching. The inference is, however, unjustified. That certain number-pictures are easier to estimate numerically does not necessarily mean that they are more instructive in learning. One set may be easier to estimate just because they are more familiar, having been oftener experienced. Even if the favored set was so after equal experience with all sets, accuracy of estimation would be a sign of superiority for use in instruction only if all other things were equal (or in favor of the arrangement in question). Obviously the way to decide which of these is best to use in teaching is by using them in teaching and measuring all relevant results, not by merely recording which of them are most accurately estimated in certain time exposures.

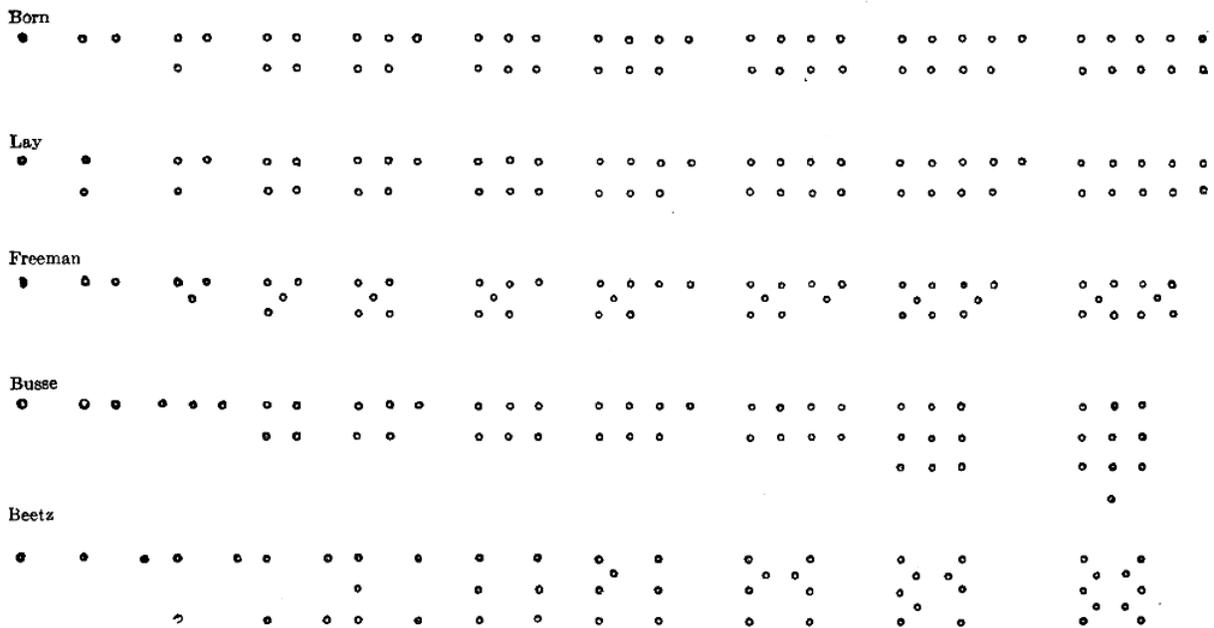


FIG. 60.—Various proposed arrangements of dots for use in teaching the meanings of the numbers 1 to 10.

It may be noted that the Born, Lay, and Freeman pictures have claims for special consideration on grounds of probable instructiveness. Since they are also superior in the tests in respect to accuracy of estimate, choice should probably be made from these three by any teacher who wishes to connect one set of number-pictures systematically with the number names, as by drills with the blackboard or with cards.

Such drills are probably useful if undertaken with zeal, and if kept as supplementary to more realistic objective work with play money, children marching, material to be distributed, garden-plot lengths to be measured, and the like, and if so administered that the pupils soon get the generalized abstract meaning of the numbers freed from dependence on an inner picture of any sort. This freedom is so important that it may make the use of many types of number-pictures advisable rather than the use of the one which in and of itself is best.

As Meumann says: "Perceptual reckoning can be overdone. It had its chief significance for the surety and clearness of the first foundation of arithmetical instruction. If, however, it is continued after the first operations become familiar to the child, and extended to operations which develop from these elementary ones, it necessarily works as a retarding force and holds back the natural development of arithmetic. This moves on to work with abstract number and with mechanical association and reproduction." ['07, Vol. 2, p. 357.]

Such drills are commonly overdone by those who make use of them, being given too often, and continued after their instructiveness has waned, and used instead of more significant, interesting, and varied work in counting and estimating and measuring real things. Consequently, there is now rather a prejudice against them in our better schools. They should probably be reinstated but to a moderate and judicious use.

ORAL, MENTAL, AND WRITTEN ARITHMETIC

There has been much dispute over the relative merits of oral and written work in arithmetic—a question which is much confused by the different meanings of 'oral' and 'written.' *Oral* has meant (1) work where the situations are presented orally and the pupil's final responses are given orally, or (2)

work where the situations are presented orally and the pupils' final responses are written or partly written and partly oral, or (3) work where the situations are presented in writing or print and the final responses are oral. *Written* has meant (1) work where the situations are presented in writing or print and the final responses are made in writing, or (2) work where also many of the intermediate responses are written, or (3) work where the situations are presented orally but the final responses and a large percentage of the intermediate computational responses are written. There are other meanings than these.

It is better to drop these very ambiguous terms and ask clearly what are the merits and demerits, in the case of any specified arithmetical work, of auditory and of visual presentation of the situations, and of saying and of writing each specified step in the response.

The disputes over mental *versus* written arithmetic are also confused by ambiguities in the use of 'mental.' Mental has been used to mean "done without pencil and paper" and also "done with few overt responses, either written or spoken, between the setting of the task and the announcement of the answer." In neither case is the word *mental* specially appropriate as a description of the total fact. As before, we should ask clearly, "What are the merits and demerits of making certain specified intermediate responses in inner speech or imaged sounds or visual images or imageless thought—that is, *without* actual writing or overt speech?"

It may be said at the outset that oral, written, and inner presentations of initial situations, oral, written, and inner announcements of final responses, and oral, written, and inner management of intermediate processes have varying degrees of merit according to the particular arithmetical exercise, pupil, and context. Devotion to oralness or mentalness as such is simply fanatical. Various combinations, such as the written presentation of the situation with inner management of the intermediate responses and oral announcement of the final response have their special merits for particular cases.

These merits the reader can evaluate for himself for any given sort of work for a given class by considering: (1) The amount of practice received by the class per hour spent; (2) the ease of correction of the work; (3) the ease of understanding the tasks; (4) the prevention of cheating; (5) the

cheerfulness and sociability of the work; (6) the freedom from eyestrain, and other less important desiderata.

It should be noted that the stock schemes A, B, C, and D below are only a few of the many that are possible and that schemes E, F, G, and H have special merits.

The common practice of either having no use made of pencil and paper or having all computations and even much verbal analysis written out elaborately for examination is unfavorable for learning. The demands which life itself will make of arithmetical knowledge and skill will range from tasks done with every percentage of written work from zero up to the case where every main result obtained by thought is recorded for later use by further thought. In school the best way is that which, for the pupils in question, has the best total effect upon quality of product, speed, and ease of production, reënforcement of training already given, and preparation for training to be given. There is nothing intellectually criminal about using a pencil as well as inner thought; on the other hand there is no magical value in writing out for the teacher's inspection figures that the pupil does not need in order to attain, preserve, verify, or correct his result.

PRESENTATION OF INITIAL SITUATION	MANAGEMENT OF INTERMEDIATE PROCESSES	ANNOUNCEMENT OF FINAL RESPONSE
A. Printed or written	Written	Written
B. " "	Inner	Oral by one pupil, inner by the rest
C. Oral (by teacher)	Written	Written
D. " "	Inner	Oral by one pupil, inner by the rest
E. As in A or C	A mixture, the pupil writing what he needs	As in A or B or H
F. The real situation itself, in part at least	As in E	As in A or B or H
G. Both read by the pupil and put orally	As in E	As in A or B or H

by the teacher

H. As in A or C or G

As in E

Written by all
pupils, announced
orally by one pupil

The common practice of having the final responses of all *easy* tasks given orally has no sure justification. On the contrary, the great advantage of having all pupils really do the work should be secured in the easy work more than anywhere else. If the time cost of copying the figures is eliminated by the simple plan of having them printed, and if the supervision cost of examining the papers is eliminated by having the pupils correct each other's work in these easy tasks, written answers are often superior to oral except for the elements of sociability and 'go' and freedom from eyestrain of the oral exercise. Such written work provides the gifted pupils with from two to ten times as much practice as they would get in an oral drill on the same material, supposing them to give inner answers to every exercise done by the class as a whole; it makes sure that the dull pupils who would rarely get an inner answer at the rate demanded by the oral exercise, do as much as they are able to do.

Two arguments often made for the oral statement of problems by the teacher are that problems so put are better understood, especially in the grades up through the fifth, and that the problems are more likely to be genuine and related to the life the pupils know. When these statements are true, the first is a still better argument for having the pupils read the problems *aided by the teacher's oral statement of them*. For the difficulty is largely that the pupils cannot read well enough; and it is better to help them to surmount the difficulty rather than simply evade it. The second is not an argument for oralness *versus* writtenness, but for good problems *versus* bad; the teacher who makes up such good problems should, in fact, take special care to write them down for later use, which may be by voice or by the blackboard or by printed sheet, as is best.

CHAPTER XIV

THE CONDITIONS OF LEARNING: THE PROBLEM ATTITUDE

Dewey, and others following him, have emphasized the desirability of having pupils do their work as active seekers, conscious of problems whose solution satisfies some real need of their own natures. Other things being equal, it is unwise, they argue, for pupils to be led along blindfold as it were by the teacher and textbook, not knowing where they are going or why they are going there. They ought rather to have some living purpose, and be zealous for its attainment.

This doctrine is in general sound, as we shall see, but it is often misused as a defense of practices which neglect the formation of fundamental habits, or as a recommendation to practices which are quite unworkable under ordinary classroom conditions. So it seems probable that its nature and limitations are not thoroughly known, even to its followers, and that a rather detailed treatment of it should be given here.

ILLUSTRATIVE CASES

Consider first some cases where time spent in making pupils understand the end to be attained before attacking the task by which it is attained, or care about attaining the end (well or ill understood) is well spent.

It is well for a pupil who has learned (1) the meanings of the numbers one to ten, (2) how to count a collection of ten or less, and (3) how to measure in inches a magnitude of ten, nine, eight inches, etc., to be confronted with the problem of true adding without counting or measuring, as in 'hidden' addition and measurement by inference. For example, the teacher has three pencils counted and put under a book; has two more counted and put under

the book; and asks, "How many pencils are there under the book?" Answers, when obtained, are verified or refuted by actual counting and measuring.

The time here is well spent because the children can do the necessary thinking if the tasks are well chosen; because they are thereby prevented from beginning their study of addition by the bad habit of pseudo-adding by looking at the two groups of objects and counting their number instead of real adding, that is, thinking of the two numbers and inferring their sum; and further, because facing the problem of adding as a real problem is in the end more economical for learning arithmetic and for intellectual training in general than being enticed into adding by objective or other processes which conceal the difficulty while helping the pupil to master it.

The manipulation of short multiplication may be introduced by confronting the pupils with such problems as, "How to tell how many Uneeda biscuit there are in four boxes, by opening only one box." Correct solutions by addition should be accepted. Correct solutions by multiplication, if any gifted children think of this way, should be accepted, even if the children cannot justify their procedure. (Inferring the manipulation from the place-values of numbers is beyond all save the most gifted and probably beyond them.) Correct solution by multiplication by some child who happens to have learned it elsewhere should be accepted. Let the main proof of the trustworthiness of the manipulation be by measurement and by addition. Proof by the stock arguments from the place-values of numbers may also be used. If no child hits on the manipulation in question, the problem of finding the length *without* adding may be set. If they still fail, the problem may be made easier by being put as "4 times 22 gives the answer. Write down what you think 4 times 22 will be." Other reductions of the difficulty of the problem may be made, or the teacher may give the answer without very great harm being done. The important requirement is that the pupils should be aware of the problem and treat the manipulation as a solution of it, not as a form of educational ceremonial which they learn to satisfy the whims of parents and teachers. In the case of any particular class a situation that is more appealing to the pupils' practical interests than the situation used here can probably be devised.

The time spent in this way is well spent (1) because all but the very dull pupils can solve the problem in some way, (2) because the significance of the manipulation as an economy over addition is worth bringing out, and (3)

because there is no way of beginning training in short multiplication that is much better.

In the same fashion multiplication by two-place numbers may be introduced by confronting pupils with the problem of the number of sheets of paper in 72 pads, or pieces of chalk in 24 boxes, or square inches in 35 square feet, or the number of days in 32 years, or whatever similar problem can be brought up so as to be felt as a problem.

Suppose that it is the 35 square feet. Solutions by $(5 \times 144) + (30 \times 144)$, however arranged, or by $(10 \times 144) + (10 \times 144) + (10 \times 144) + (5 \times 144)$, or by $3500 + (35 \times 40) + (35 \times 4)$, or by $7 \times (5 \times 144)$, however arranged, should all be listed for verification or rejection. The pupils need not be required to justify their procedures by a verbal statement. Answers like 432,720, or 720,432, or 1152, or 4220, or 3220 should be listed for verification or rejection. Verification may be by a mixture of short multiplication and objective work, or by a mixture of short multiplication and addition, or by addition abbreviated by taking ten 144s as 1440, or even (for very stupid pupils) by the authority of the teacher. Or the manipulation in cases like 53×9 or 84×7 may be verified by the reverse short multiplication. The deductive proof of the correctness of the manipulation may be given in whole or in part in connection with exercises like

$10 \times 2 =$	$30 \times 14 =$
$10 \times 3 =$	$3 \times 44 =$
$10 \times 4 =$	$30 \times 44 =$
$10 \times 14 =$	$3 \times 144 =$
$10 \times 44 =$	$20 \times 144 =$
10×144	$40 \times 144 =$
$=$	
$20 \times 2 =$	$30 \times 144 =$
$20 \times 3 =$	$5 \times 144 =$
$30 \times 3 =$	$35 = 30 + \dots$
$30 \times 4 =$	30×144 added to 5×144
	$=$
$3 \times 14 =$	

Certain wrong answers may be shown to be wrong in many ways; *e.g.*, 432,720 is too big, for 35 times a thousand square inches is only 35,000; 1152 is too small, for 35 times a hundred square inches would be 3500, or more than 1152.

The time spent in realizing the problem here is fairly well spent because (1) any successful original manipulation in this case represents an excellent exercise of thought, because (2) failures show that it is useless to juggle the figures at random, and because (3) the previous experience with short multiplication makes it possible for the pupils to realize the problem in a very few minutes. It may, however, be still better to give the pupils the right method just as soon as the problem is realized, without having them spend more time in trying to solve it. Thus:—

1 square foot has 144 square inches. How many square inches are there in 35 square feet (marked out in chalk on the floor as a piece 10 ft. \times 3 ft. plus a piece 5 ft. \times 1 ft.)?

1 yard = 36 inches. How many inches long is this wall (found by measure to be 13 yards)?

Here is a quick way to find the answers:—

$$\begin{array}{r} 144 \\ 35 \end{array}$$

$$\begin{array}{r} \text{---} \\ 720 \\ 432 \\ \text{---} \end{array}$$

5040 sq. inches in 35 sq. ft.

$$\begin{array}{r} 36 \\ 13 \\ \text{---} \\ 108 \\ 36 \\ \text{---} \end{array}$$

468 inches in 13 yd.

Consider now the following introduction to dividing by a decimal:—

Dividing by a Decimal

1. How many minutes will it take a motorcycle, to go 12.675 miles at the rate of .75 mi. per minute?

$$\begin{array}{r} 16.9 \\ .75 \overline{) 12.675} \\ \underline{75} \\ 517 \\ \underline{450} \\ 675 \\ \underline{675} \end{array}$$

2. Check by multiplying 16.9 by .75.
3. How do you know that the quotient cannot be as little as 1.69?
4. How do you know that the quotient cannot be as large as 169?
5. Find the quotient for $3.75 \div 1.5$.
6. Check your result by multiplying the quotient by the divisor.
7. How do you know that the quotient cannot be .25 or 25 ?
8. Look at this problem. $.25 \overline{) 7.5}$

How do you know that 3.0 is wrong for the quotient?

How do you know that 300 is wrong for the quotient?

State which quotient is right for each of these:—

9. $\begin{array}{r} .021 \text{ or } .21 \text{ or } 2.1 \text{ or } 21 \text{ or } 210 \\ 1.8 \overline{)3.78} \end{array}$

10. $\begin{array}{r} .021 \text{ or } .21 \text{ or } 21 \text{ or } 210 \\ 1.8 \overline{)37.8} \end{array}$

11. $\begin{array}{r} .03 \text{ or } .3 \text{ or } 3 \text{ or } 30 \text{ or } 300 \\ 1.25 \overline{)37.5} \end{array}$

12. $\begin{array}{r} .03 \text{ or } .3 \text{ or } 3 \text{ or } 30 \text{ or } 300 \\ 12.5 \overline{)37.5} \end{array}$

13. $\begin{array}{r} .05 \text{ or } .5 \text{ or } 5 \text{ or } 50 \text{ or } 500 \\ 1.25 \overline{)6.25} \end{array}$

14. $\begin{array}{r} .05 \text{ or } .5 \text{ or } 5 \text{ or } 50 \text{ or } 500 \\ 12.5 \overline{)6.25} \end{array}$

15. Is this rule true? If it is true, learn it.

In a correct result, the number of decimal places in the divisor and quotient together equals the number of decimal places in the dividend.

These and similar exercises excite the problem attitude in children *who have a general interest in getting right answers*. Such a series carefully arranged is a desirable introduction to a statement of the rule for placing the decimal point in division with decimals. For it attracts attention to the general principle (divisor \times quotient should equal dividend), which is more important than the rule for convenient location of the decimal point, and it gives training in placing the point by inspection of the divisor, quotient, and dividend, which suffices for nineteen out of twenty cases that the pupil will ever encounter outside of school. He is likely to remember this method by inspection long after he has forgotten the fixed rule.

It is well for the pupil to be introduced to many arithmetical facts by way of problems about their common uses. The clockface, the railroad distance table in hundredths of a mile, the cyclometer and speedometer, the recipe, and the like offer problems which enlist his interest and energy and also connect the resulting arithmetical learning with the activities where it is needed. There is no time cost, but a time-saving, for the learning as a means to the solution of the problems is quicker than the mere learning of the

arithmetical facts by themselves alone. A few samples of such procedure are shown below:—

GRADE 3

To be Done at Home

Look at a watch. Has it any hands besides the hour hand and the minute hand? Find out all that you can about how a watch tells seconds, how long a second is, and how many seconds make a minute.

GRADE 5

Measuring Rainfall

Rainfall per Week (cu. in. per sq. in. of area)

June	1-7	1.056
	8-14	1.103
	15-21	1.040
	22-28	.960
	29-July 5	.915
July	6-12	.782
	13-19	.790
	20-26	.670
	27-Aug. 2	.503
Aug.	3-9	.512
	10-16	.240
	17-23	.215
	24-30	.811

1. In which weeks was the rainfall 1 or more?
2. Which week of August had the largest rainfall for that month?
3. Which was the driest week of the summer? (Driest means with the least rainfall.)
4. Which week was the next to the driest?
5. In which weeks was the rainfall between .800 and 1.000?
6. Look down the table and estimate whether the average rainfall for one week was about .5, or about .6, or about .7, or about .8, or about .9.

Dairy Records

Record of Star Elsie

	Pounds of Milk	Butter-Fat per Pound of Milk
Jan.	1742	.0461
Feb.	1690	.0485
Mar.	1574	.0504
Apr.	1226	.0490
May	1202	.0466
June	1251	.0481

Read this record of the milk given by the cow Star Elsie. The first column tells the number of pounds of milk given by Star Elsie each month. The second column tells what fraction of a pound of butter-fat each pound of milk contained.

1. Read the first line, saying, "In January this cow gave 1742 pounds of milk. There were 461 ten thousandths of a pound of butter-fat per pound of milk." Read the other lines in the same way.

2. How many pounds of butter-fat did the cow produce in Jan.? 3. In Feb.? 4. In Mar.? 5. In Apr.? 6. In May? 7. In June?

GRADE 5 OR LATER

Using Recipes to Make Larger or Smaller Quantities

I. State how much you would use of each material in the following recipes: (a) To make double the quantity. (b) To make half the quantity. (c) To make $1\frac{1}{2}$ times the quantity. You may use pencil and paper when you cannot find the right amount mentally.

1. PEANUT

PENUCHE

1 tablespoon
butter

2 cups brown
sugar

$\frac{1}{3}$ cup milk or
cream

$\frac{3}{4}$ cup chopped
peanuts

$\frac{1}{3}$ teaspoon salt

2. MOLASSES

CANDY

$\frac{1}{2}$ cup butter

2 cups sugar

1 cup molasses

$1\frac{1}{2}$ cups boiling
water

3. RAISIN OPERA**CARAMELS**

2 cups light
brown sugar

$\frac{7}{8}$ cup thin
cream

$\frac{1}{2}$ cup raisins

4. WALNUT**MOLASSES SQUARES**

2 tablespoons
butter

1 cup molasses

$\frac{1}{3}$ cup sugar

$\frac{1}{2}$ cup walnut
meats

5. RECEPTION**ROLLS**

1 cup scalded
milk

$1\frac{1}{2}$ tablespoons
sugar

1 teaspoon salt

$\frac{1}{4}$ cup lard

1 yeast cake

$\frac{1}{4}$ cup lukewarm
water

White of 1 egg

$3\frac{1}{2}$ cups flour

6. GRAHAM RAISED**LOAF**

2 cups milk

6 tablespoons
molasses

$1\frac{1}{2}$ teaspoons salt

$\frac{1}{3}$ yeast cake

$\frac{1}{4}$ cup lukewarm
water

2 cups sifted
Graham flour

$\frac{1}{2}$ cup Graham
bran

$\frac{3}{4}$ cup flour (to
knead)

II. How much would you use of each material in the following recipes: (a) To make $\frac{2}{3}$ as large a quantity? (b) To make $1\frac{1}{3}$ times as much? (c) To make $2\frac{1}{2}$ times as much?

1. ENGLISH**DUMPLINGS**

$\frac{1}{2}$ pound beef
suet

2. WHITE MOUNTAIN**ANGEL CAKE**

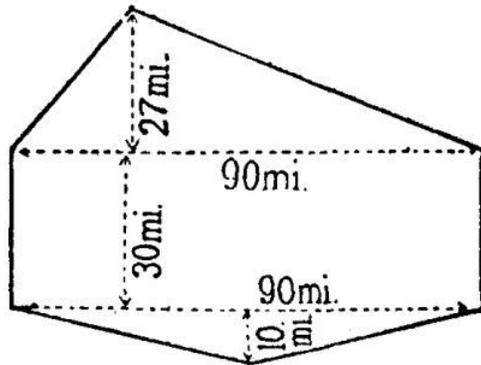
$1\frac{1}{2}$ cups egg whites

1¼ cups flour	1½ cups sugar
3 teaspoons baking powder	1 teaspoon cream of tartar
1 teaspoon salt	1 cup bread flour
½ teaspoon pepper	¼ teaspoon salt
1 teaspoon minced parsley	1 teaspoon vanilla
¼ cup cold water	

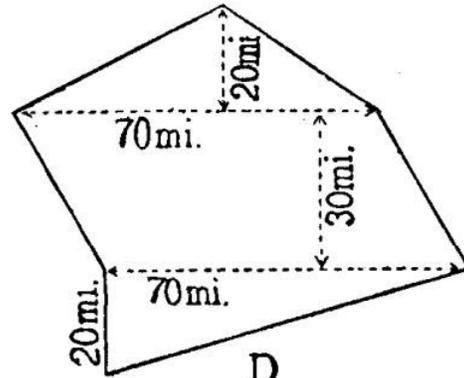
In many cases arithmetical facts and principles can be well taught in connection with some problem or project which is not arithmetical, but which has special potency to arouse an intellectual activity in the pupil which by some ingenuity can be directed to arithmetical learning. Playing store is the most fundamental case. Planning for a party, seeing who wins a game of bean bag, understanding the calendar for a month, selecting Christmas presents, planning a picnic, arranging a garden, the clock, the watch with second hand, and drawing very simple maps are situations suggesting problems which may bring a living purpose into arithmetical learning in grade 2. These are all available under ordinary conditions of class instruction. A sample of such problems for a higher grade (6) is shown below.

Estimating Areas

The children in the geography class had a contest in estimating the areas of different surfaces. Each child wrote his estimates for each of these maps, A, B, C, D, and E. (Only C and D are shown here.) In the arithmetic class they learned how to find the exact areas. Then they compared their estimates with the exact areas to find who came nearest.



C



D

Write your estimates for A, B, C, D, and E. Then study the next 6 pages and learn how to find the exact areas.

(The next 6 pages comprise training in the mensuration of parallelograms and triangles.)

In some cases the affairs of individual pupils include problems which may be used to guide the individual in question to a zealous study of arithmetic as a means of achieving his purpose—of making a canoe, surveying an island, keeping the accounts of a Girls' Canning Club, or the like. It requires much time and very great skill to direct the work of thirty or more pupils each busy with a special type of his own, so as to make the work instructive for each, but in some cases the expense of time and skill is justified.

GENERAL PRINCIPLES

In general what should be meant when one says that it is desirable to have pupils in the problem-attitude when they are studying arithmetic is substantially as follows:—

First.—Information that comes as an answer to questions is better attended to, understood, and remembered than information that just comes.

Second.—Similarly, movements that come as a step toward achieving an end that the pupil has in view are better connected with their appropriate situations, and such connections are longer retained, than is the case with movements that just happen.

Third.—The more the pupil is set toward getting the question answered or getting the end achieved, the greater is the satisfyingness attached to the bonds of knowledge or skill which mean progress thereto.

Fourth.—It is bad policy to rely exclusively on the purely intellectualistic problems of "How can I do this?" "How can I get the right answer?" "What is the reason for this?" "Is there a better way to do that?" and the like. It is bad policy to supplement these intellectualistic problems by only the remote problems of "How can I be fitted to earn a higher wage?" "How can I make sure of graduating?" "How can I please my parents?" and the like. The purely intellectualistic problems have too weak an appeal for many pupils; the remote problems are weak so long as they are remote and, what is worse, may be deprived of the strength that they would have in due time if we attempt to use them too soon. It is the extreme of bad policy to neglect those personal and practical problems furnished by life outside the class in arithmetic the solution of which can really be furthered by arithmetic then and there. It is good policy to spend time in establishing certain mental sets—stimulating, or even creating, certain needs—setting up problems themselves—when the time so spent brings a sufficient improvement in the quality and quantity of the pupils' interest in arithmetical learning.

Fifth.—It would be still worse policy to rely exclusively on problems arising outside arithmetic. To learn arithmetic is itself a series of problems of intrinsic interest and worth to healthy-minded children. The need for ability to multiply with United States money or to add fractions or to compute percents may be as truly vital and engaging as the need for skill to make a party dress or for money to buy it or for time to play baseball. The intellectualistic needs and problems should be considered along with all others, and given whatever weight their educational value deserves.

DIFFICULTY AND SUCCESS AS STIMULI

There are certain misconceptions of the doctrine of the problem-attitude. The most noteworthy is that difficulty—temporary failure—an inadequacy of already existing bonds—is the essential and necessary stimulus to thinking and learning. Dewey himself does not, as I understand him, mean this, but he has been interpreted as meaning it by some of his followers. ^[22]

Difficulty—temporary failure, inadequacy of existing bonds—on the contrary does nothing whatsoever in and of itself; and what is done by the annoying lack of success which sometimes accompanies difficulty sometimes hinders thinking and learning.

Mere difficulty, mere failure, mere inadequacy of existing bonds, does nothing. It is hard for me to add three eight-place numbers at a glance; I have failed to find as effective illustrations for pages 276 to 277 as I wished; my existing sensori-motor connections are inadequate to playing a golf course in 65. But these events and conditions have done nothing to stimulate me in respect to the behavior in question. In the first of the three there is no annoying lack and no dynamic influence at all; in the second there was to some degree an annoying lack—a slight irritation at not getting just what I wanted,—and this might have impelled me to further thinking (though it did not, and getting one tiptop illustration would as a rule stimulate me to hunt for others more than failing to get such). In the third case the lack of the 65 does not annoy me or have any noteworthy dynamic effect. The lack of 90 instead of 95-100 is annoying and is at times a stimulus to further learning, though not nearly so strong a stimulus as the attainment of the 90 would be! At other times this annoying lack is distinctly inhibitory—a stimulus to ceasing to learn. In the intellectual life the inhibitory effect seems far the commoner of the two. Not getting answers seems as a rule to make us stop trying to get them. The annoying lack of success with a theoretical problem most often makes us desert it for problems to whose solution the existing bonds promise to be more adequate.

The real issue in all this concerns the relative strength, in the pupil's intellectual life, of the "negative reaction" of behavior in general. An animal whose life processes are interfered with so that an annoying state of affairs is set up, changes his behavior, making one after another responses as his instincts and learned tendencies prescribe, until the annoying state of affairs is terminated, or the animal dies, or suffers the annoyance as less than the alternatives which his responses have produced. When the annoying state of affairs is characterized by the failure of things as they are to minister to a craving—as in cases of hunger, loneliness, sex-pursuit, and the like,—we have stimulus to action by an annoying lack or need, with relief from action by the satisfaction of the need.

Such is in some measure true of man's intellectual life. In recalling a forgotten name, in solving certain puzzles, or in simplifying an algebraic complex, there is an annoying lack of the name, solution, or factor, a trial of one after another response, until the annoyance is relieved by success or made less potent by fatigue or distraction. Even here the *difficulty* does not do anything—but only the annoying interference with our intellectual peace by the problem. Further, although for the particular problem, the annoying lack stimulates, and the successful attainment stops thinking, the later and more important general effect on thinking is the reverse. Successful attainment stops our thinking *on that problem* but makes us more predisposed later to thinking *in general*.

Overt negative reaction, however, plays a relatively small part in man's intellectual life. Filling intellectual voids or relieving intellectual strains in this way is much less frequent than being stimulated positively by things seen, words read, and past connections acting under modified circumstances. The notion of thinking as coming to a lack, filling it, meeting an obstacle, dodging it, being held up by a difficulty and overcoming it, is so one-sided as to verge on phantasy. The overt lacks, strains, and difficulties come perhaps once in five hours of smooth straightforward use and adaptation of existing connections, and they might as truly be called hindrances to thought—barriers which past successes help the thinker to surmount. Problems themselves come more often as cherished issues which new facts reveal, and whose contemplation the thinker enjoys, than as strains or lacks or 'problems which I need to solve.' It is just as true that the thinker gets many of his problems as results from, or bonuses along with, his information, as that he gets much of his information as results of his efforts to solve problems.

As between difficulty and success, success is in the long run more productive of thinking. Necessity is not the mother of invention. Knowledge of previous inventions is the mother; original ability is the father. The solutions of previous problems are more potent in producing both new problems and their solutions than is the mere awareness of problems and desire to have them solved.

In the case of arithmetic, learning to cancel instead of getting the product of the dividends and the product of the divisors and dividing the former by the latter, is a clear case of very valuable learning, with ease emphasized rather than difficulty, with the adequacy of existing bonds (when slightly

redirected) as the prime feature of the process rather than their inadequacy, and with no sense of failure or lack or conflict. It would be absurd to spend time in arousing in the pupil, before beginning cancellation, a sense of a difficulty—viz., that the full multiplying and dividing takes longer than one would like. A pupil in grade 4 or 5 might well contemplate that difficulty for years to no advantage. He should at once begin to cancel and prove by checking that errorless cancellation always gives the right answer. To emphasize before teaching cancellation the inadequacy of the old full multiplying and dividing would, moreover, not only be uneconomical as a means to teaching cancellation; it would amount to casting needless slurs on valuable past acquisitions, and it would, scientifically, be false. For, until a pupil has learned to cancel, the old full multiplying is not inadequate; it is admirable in every respect. The issue of its inadequacy does not truly appear until the new method is found. It is the best way until the better way is mastered.

In the same way it is unwise to spend time in making pupils aware of the annoying lacks to be supplied by the multiplication tables, the division tables, the casting out of nines, or the use of the product of the length and breadth of a rectangle as its area, the unit being changed to the square erected on the linear unit as base. The annoying lack will be unproductive, while the learning takes place readily as a modification of existing habits, and is sufficiently appreciated as soon as it does take place. The multiplication tables come when instead of merely counting by 7s from 0 up saying "7, 14, 21," etc., the pupil counts by 7s from 0 up saying "Two sevens make 14, three sevens make 21, four sevens make 28," etc. The division tables come as easy selections from the known multiplications; the casting out of nines comes as an easy device. The computation of the area of a rectangle is best facilitated, not by awareness of the lack of a process for doing it, but by awareness of the success of the process as verified objectively.

In all these cases, too, the pupil would be misled if we aroused first a sense of the inadequacy of counting, adding, and objective division, an awareness of the difficulties which the multiplication and division tables and nines device and area theorem relieve. The displaced processes are admirable and no unnecessary fault should be found with them, and they are *not* inadequate until the shorter ways have been learned.

FALSE INFERENCE

One false inference about the problem-attitude is that the pupil should always understand the aim or issue before beginning to form the bonds which give the method or process that provides the solution. On the contrary, he will often get the process more easily and value it more highly if he is taught what it is *for* gradually while he is learning it. The system of decimal notation, for example, may better be taken first as a mere fact, just as we teach a child to talk without trying first to have him understand the value of verbal intercourse, or to keep clean without trying first to have him understand the bacteriological consequences of filth.

A second inference—that the pupil should always be taught to care about an issue and crave a process for managing it before beginning to learn the process—is equally false. On the contrary, the best way to become interested in certain issues and the ways of handling them is to learn the process—even to learn it by sheer habituation—and then note what it does for us. Such is the case with ".1666 $\frac{2}{3}$ \times = divide by 6," ".333 $\frac{1}{3}$ \times = divide by 3," "multiply by .875 = divide the number by 8 and subtract the quotient from the number."

A third unwise tendency is to degrade the mere giving of information—to belittle the value of facts acquired in any other way than in the course of deliberate effort by the pupil to relieve a problem or conflict or difficulty. As a protest against merely verbal knowledge, and merely memoriter knowledge, and neglect of the active, questioning search for knowledge, this tendency to belittle mere facts has been healthy, but as a general doctrine it is itself equally one-sided. Mere facts not got by the pupil's thinking are often of enormous value. They may stimulate to active thinking just as truly as that may stimulate to the reception of facts. In arithmetic, for example, the names of the numbers, the use of the fractional form to signify that the upper number is divided by the lower number, the early use of the decimal point in U. S. money to distinguish dollars from cents, and the meanings of "each," "whole," "part," "together," "in all," "sum," "difference," "product," "quotient," and the like are self-justifying facts.

A fourth false inference is that whatever teaching makes the pupil face a question and think out its answer is thereby justified. This is not necessarily

so unless the question is a worthy one and the answer that is thought out an intrinsically valuable one and the process of thinking used one that is appropriate for that pupil for that question. Merely to think may be of little value. To rely much on formal discipline is just as pernicious here as elsewhere. The tendency to emphasize the methods of learning arithmetic at the expense of what is learned is likely to lead to abuses different in nature but as bad in effect as that to which the emphasis on disciplinary rather than content value has led in the study of languages and grammar, or in the old puzzle problems of arithmetic.

The last false inference that I shall discuss here is the inference that most of the problems by which arithmetical learning is stimulated had better be external to arithmetic itself—problems about Noah's Ark or Easter Flowers or the Merry Go Round or A Trip down the Rhine.

Outside interests should be kept in mind, as has been abundantly illustrated in this volume, but it is folly to neglect the power, even for very young or for very stupid children, of the problem "How can I get the right answer?" Children do have intellectual interests. They do like dominoes, checkers, anagrams, and riddles as truly as playing tag, picking flowers, and baking cake. With carefully graded work that is within their powers they like to learn to add, subtract, multiply, and divide with integers, fractions, and decimals, and to work out quantitative relations.

In some measure, learning arithmetic is like learning to typewrite. The learner of the latter has little desire to present attractive-looking excuses for being late, or to save expense for paper. He has no desire to hoard copies of such and such literary gems. He may gain zeal from the fact that a school party is to be given and invitations are to be sent out, but the problem "To typewrite better" is after all his main problem. Learning arithmetic is in some measure a game whose moves are motivated by the general set of the mind toward victory—winning right answers. As a ball-player learns to throw the ball accurately to first-base, not primarily because of any particular problem concerning getting rid of the ball, or having the man at first-base possess it, or putting out an opponent against whom he has a grudge, but because that skill is required by the game as a whole, so the pupil, in some measure, learns the technique of arithmetic, not because of particular concrete problems whose solutions it furnishes, but because that

technique is required by the game of arithmetic—a game that has intrinsic worth and many general recommendations.

CHAPTER XV

INDIVIDUAL DIFFERENCES

The general facts concerning individual variations in abilities—that the variations are large, that they are continuous, and that for children of the same age they usually cluster around one typical or modal ability, becoming less and less frequent as we pass to very high or very low degrees of the ability—are all well illustrated by arithmetical abilities.

NATURE AND AMOUNT

The surfaces of frequency shown in Figs. 61, 62, and 63 are samples. In these diagrams each space along the baseline represents a certain score or degree of ability, and the height of the surface above it represents the number of individuals obtaining that score. Thus in Fig. 61, 63 out of 1000 soldiers had no correct answer, 36 out of 1000 had one correct answer, 49 had two, 55 had three, 67 had four, and so on, in a test with problems (stated in words).

Figure 61 shows that these adults varied from no problems solved correctly to eighteen, around eight as a central tendency. Figure 62 shows that children of the same year-age (they were also from the same neighborhood and in the same school) varied from under 40 to over 200 figures correct. Figure 63 shows that even among children who have all reached the same school grade and so had rather similar educational opportunities in arithmetic, the variation is still very great. It requires a range from 15 to over 30 examples right to include even nine tenths of them.

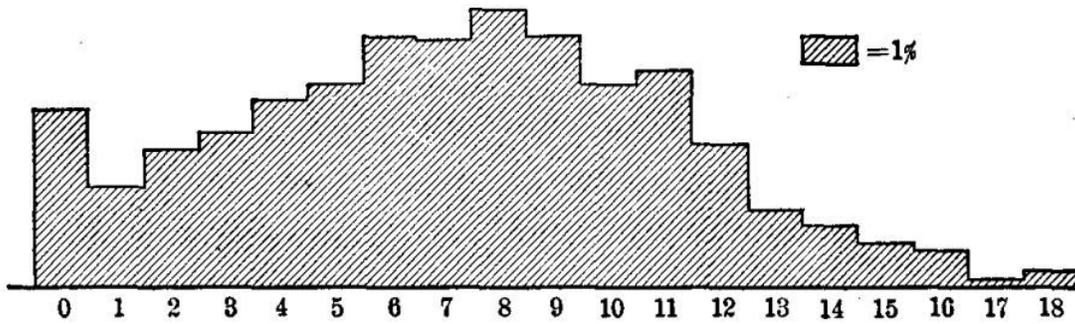


FIG. 61.—The scores of 1000 soldiers in the National Army born in English-speaking countries, in Test 2 of the Army Alpha. The score is the number of correct answers obtained in five minutes. Probably 10 to 15 percent of these men were unable to read or able to read only very easy sentences at a very slow rate. Data furnished by the Division of Psychology in the office of the Surgeon General.

It should, however, be noted that if each individual had been scored by the average of his work on eight or ten different days instead of by his work in just one test, the variability would have been somewhat less than appears in Figs. 61, 62, and 63.

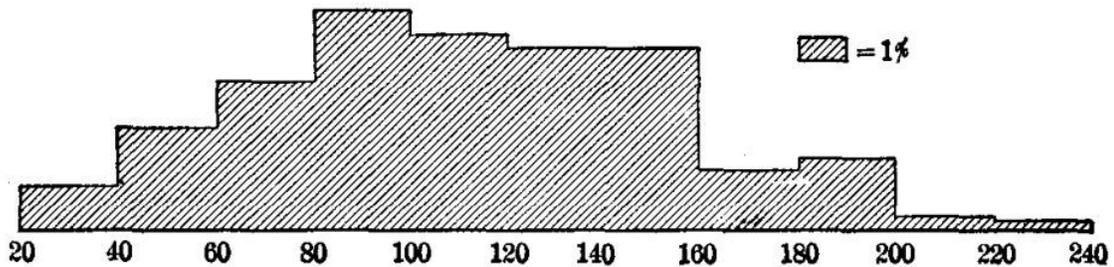


FIG. 62.—The scores of 100 11-year-old pupils in a test of computation. Estimated from the data given by Burt ['17, p. 68] for 10-, 11-, and 12-year-olds. The score equals the number of correct figures.

It is also the case that if each individual had been scored, not in problem-solving alone or division alone, but in an elaborate examination on the whole field of arithmetic, the variability would have been somewhat less than appears in Figs. 61, 62, and 63. On the other hand, if the officers and the soldiers rejected for feeblemindedness had been included in Fig. 61, if the 11-year-olds in special classes for the very dull had been included in Fig. 62,

and if all children who had been to school six years had been included in Fig. 63, no matter what grade they had reached, the effect would have been to *increase* the variability.

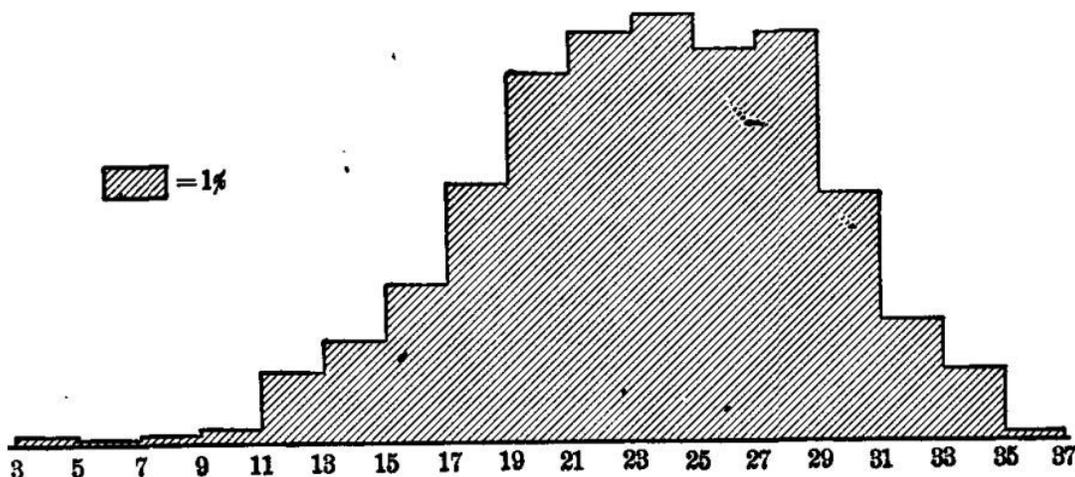


FIG. 63.—The scores of pupils in grade 6 in city schools in the Woody Division Test A. The score is the number of correct answers obtained in 20 minutes. From Woody ['16, p. 61].

In spite of the effort by school officers to collect in any one school grade those somewhat equal in ability or in achievement or in a mixture of the two, the population of the same grades in the same school system shows a very wide range in any arithmetical ability. This is partly because promotion is on a more general basis than arithmetical ability so that some very able arithmeticians are deliberately held back on account of other deficiencies, and some very incompetent arithmeticians are advanced on account of other excellencies. It is partly because of general inaccuracy in classifying and promoting pupils.

In a composite score made up of the sum of the scores in Woody tests,—Add. A, Subt. A, Mult. A, and Div. A, and two tests in problem-solving (ten and six graded problems, with maximum attainable credits of 30 and 18), Kruse ['18] found facts from which I compute those of Table 13, and Figs. 64 to 66, for pupils all having the training of the same city system, one which sought to grade its pupils very carefully.

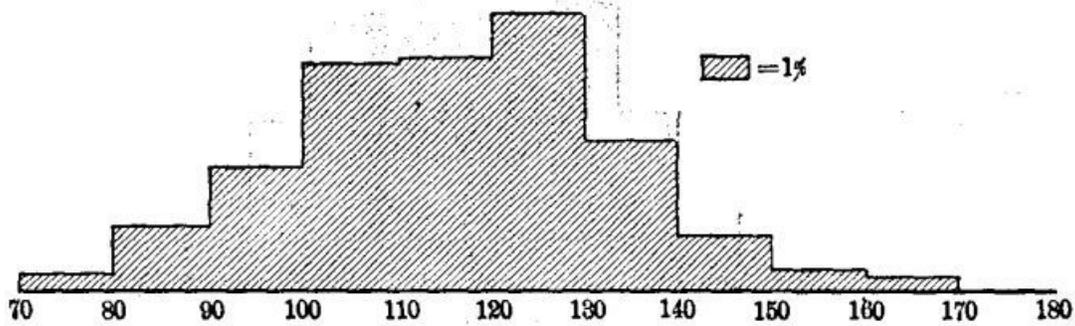


FIG. 64.

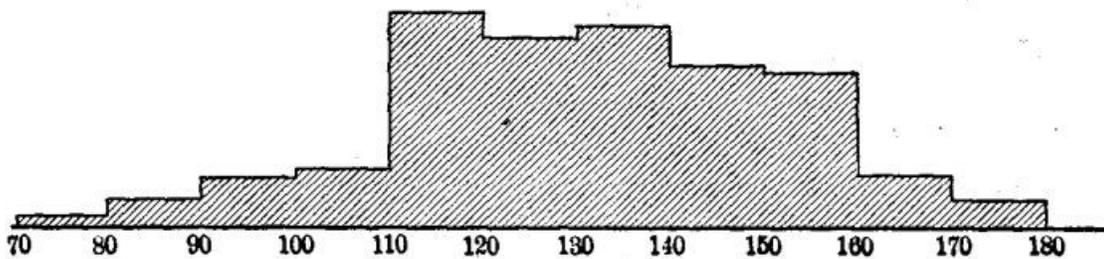


FIG. 65.

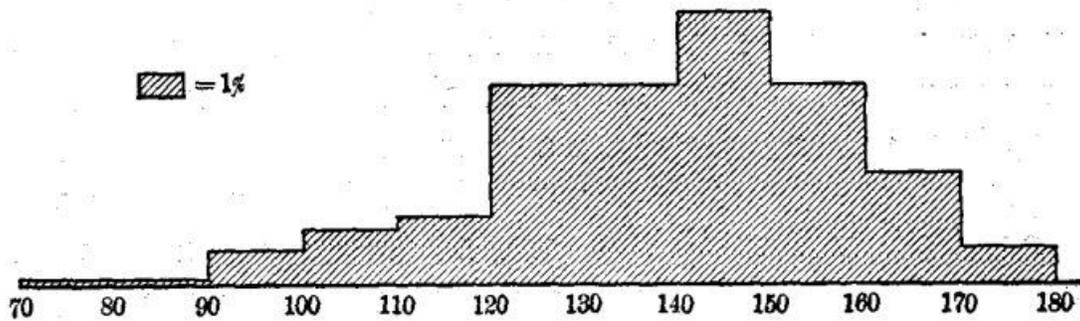


FIG. 66.

FIGS. 64, 65, and 66.—The scores of pupils in grade 6 (Fig. 64), grade 7 (Fig. 65), and grade 8 (Fig. 66) in a composite of tests in computation and problem-solving. The time was about 120 minutes. The maximum score attainable was 196.

The overlapping of grade upon grade should be noted. Of the pupils in grade 6 about 18 percent do better than the average pupil in grade 7, and about 7 percent do better than the average pupil in grade 8. Of the pupils in

grade 8 about 33 percent do worse than the average pupil in grade 7 and about 12 percent do worse than the average pupil in grade 6.

TABLE 13

RELATIVE FREQUENCIES OF SCORES IN AN EXTENSIVE TEAM OF ARITHMETICAL TESTS.^[23] IN PERCENTS

SCORE	GRADE 6	GRADE 7	GRADE 8
70 to 79	1.3	.9	.4
80 " 89	5.5	2.3	.4
90 " 99	10.6	4.3	2.9
100 " 109	19.4	5.2	4.4
110 " 119	19.8	18.5	5.8
120 " 129	23.5	16.2	16.8
130 " 139	12.6	17.5	16.8
140 " 149	4.6	13.9	22.9
150 " 159	1.7	13.6	17.1
160 " 169	1.2	4.8	9.4
170 " 179		2.5	3.3

DIFFERENCES WITHIN ONE CLASS

The variation within a single class for which a single teacher has to provide is great. Even when teaching is departmental and promotion is by subjects, and when also the school is a large one and classification within a grade is by ability—there may be a wide range for any given special component ability. Under ordinary circumstances the range is so great as to be one of the chief limiting conditions for the teaching of arithmetic. Many methods appropriate to the top quarter of the class will be almost useless for the bottom quarter, and *vice versa*.

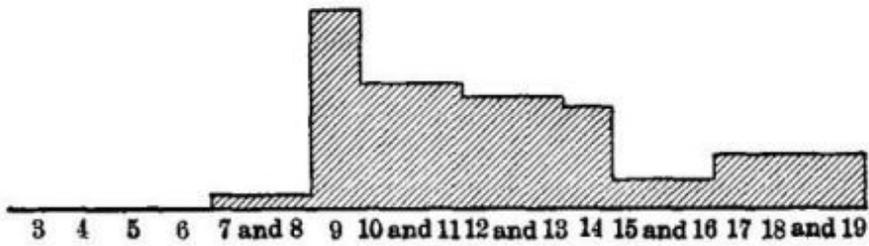
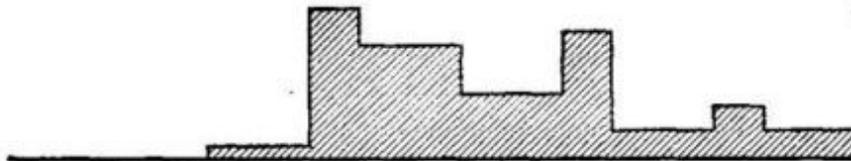
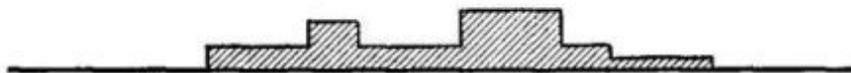
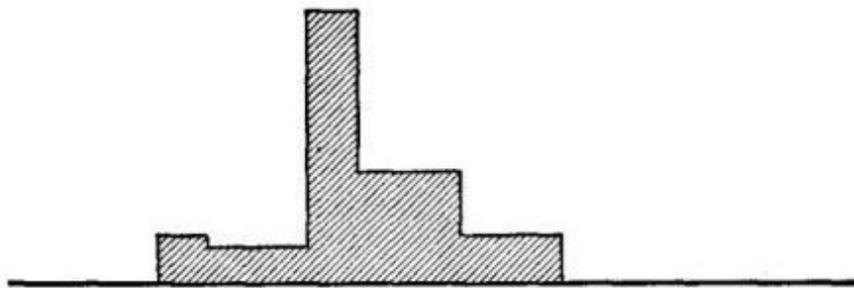
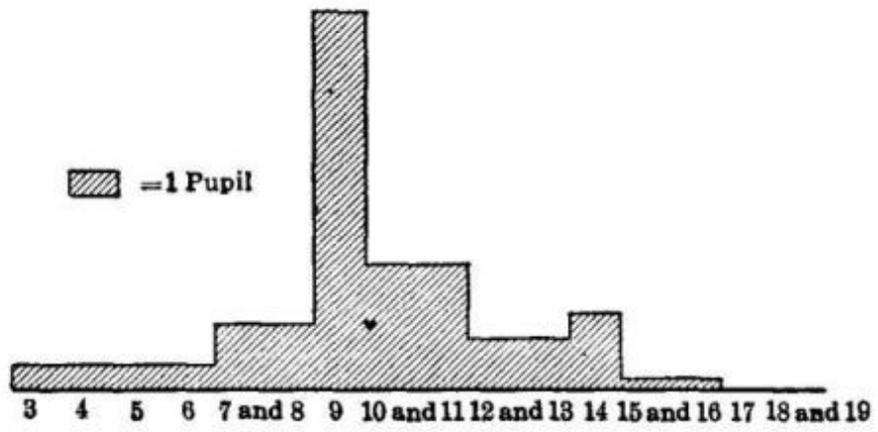


FIG. 67.

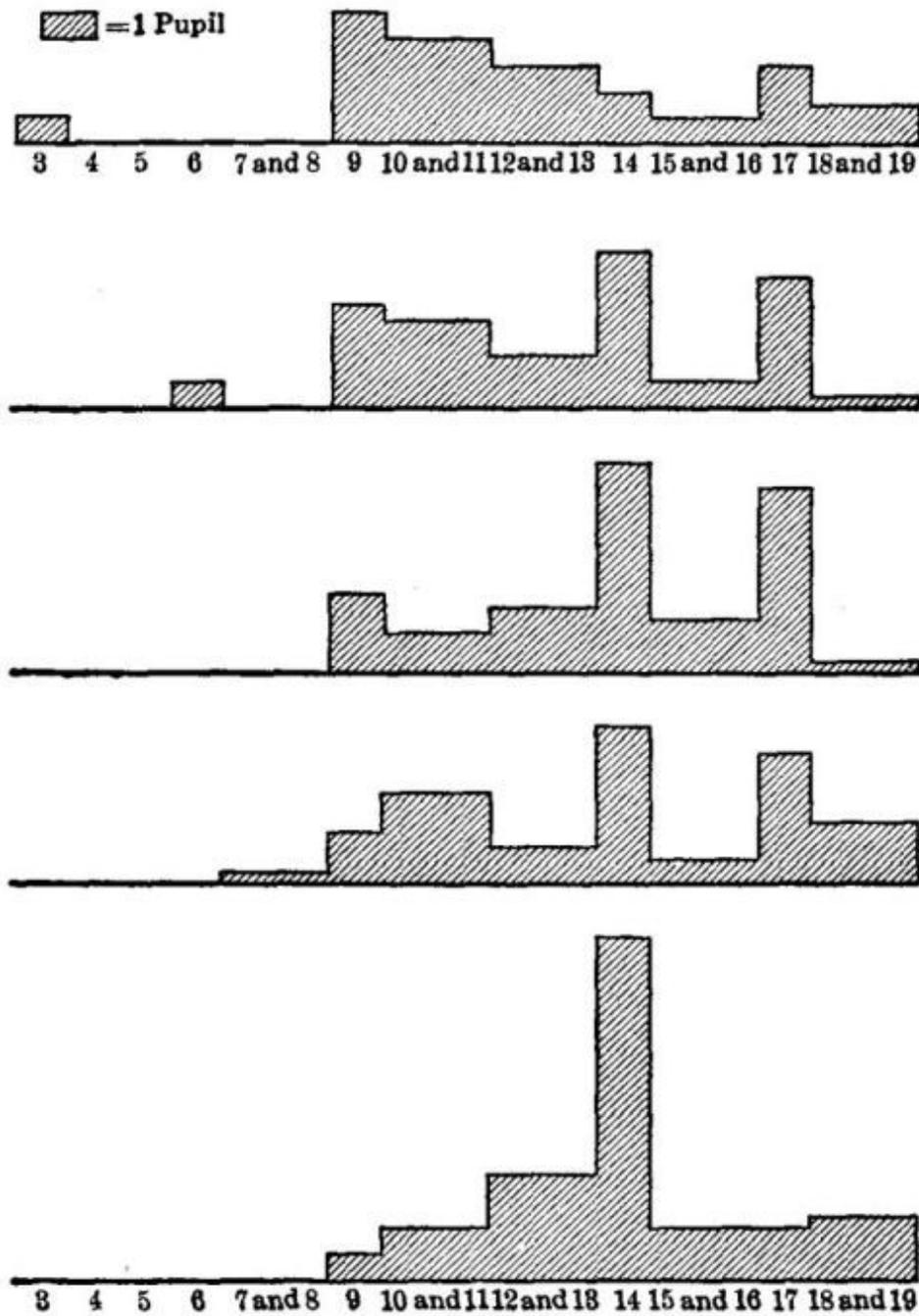


FIG. 68.

FIGS. 67 and 68.—The scores of ten 6 B classes in a 12-minute test in computation with integers (the Curtis Test 7). The score is the number of units done. Certain long tasks are counted as two units.

Figures 67 and 68 show the scores of ten classes taken at random from ninety 6 B classes in one city by Curtis [13, p. 64] in amount of computation done in 12 minutes. Observe the very wide variation present in the case of every class. The variation within a class would be somewhat reduced if each pupil were measured by his average in eight or ten such tests given on different days. If a rather generous allowance is made for this we still have a variation in speed as great as that shown in Fig. 69, as the fact to be expected for a class of thirty-two 6 B pupils.

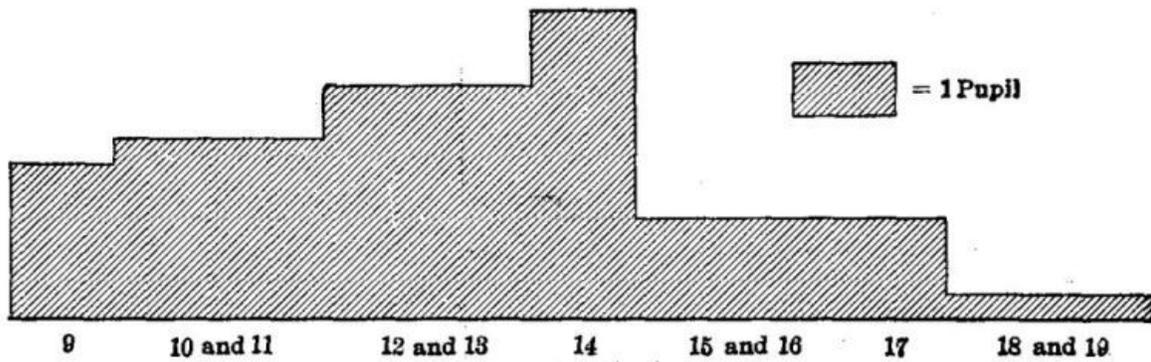


FIG. 69.—A conservative estimate of the amount of variation to be expected within a single class of 32 pupils in grade 6, in the number of units done in Courtis Test 7 when all chance variations are eliminated.

The variations within a class in respect to what processes are understood so as to be done with only occasional errors may be illustrated further as follows:—A teacher in grade 4 at or near the middle of the year in a city doing the customary work in arithmetic will probably find some pupil in her class who cannot do column addition even without carrying, or the easiest written subtraction

$$\left(\begin{array}{cc} 8 & 9 \\ \underline{5} & \underline{3} \end{array} \quad \text{or} \quad \begin{array}{c} 78 \\ \underline{37} \end{array} \right),$$

who does not know his multiplication tables or how to derive them, or understand the meanings of $+$ $-$ \times and \div , or have any useful ideas whatever about division.

There will probably be some child in the class who can do such work as that shown below, and with very few errors.

Add

$$\frac{3}{8} + \frac{5}{8} + \frac{7}{8} + \frac{1}{8} \qquad \begin{array}{r} 2\frac{1}{2} \\ 6\frac{3}{8} \\ \underline{3\frac{3}{4}} \end{array} \qquad \frac{1}{6} + \frac{3}{8}$$

Subtract

$$\begin{array}{r} 10.00 \\ \underline{3.49} \end{array} \qquad \begin{array}{r} 4 \text{ yd. } 1 \text{ ft. } 6 \text{ in.} \\ \underline{2 \text{ yd. } 2 \text{ ft. } 3 \text{ in.}} \end{array}$$

Multiply

$$\begin{array}{r} 1\frac{1}{4} \times 8 \\ \hline \end{array} \qquad \begin{array}{r} 16 \\ 2\frac{5}{8} \\ \hline \end{array} \qquad \begin{array}{r} 145 \\ 206 \\ \hline \end{array}$$

Divide

$$2 \overline{) 13.50} \qquad 25 \overline{) 9750}$$

The invention of means of teaching thirty so different children at once with the maximum help and minimum hindrance from their different capacities and acquisitions is one of the great opportunities for applied science.

Courtis, emphasizing the social demand for a certain moderate arithmetical attainment in the case of nearly all elementary school children of, say, grade 6, has urged that definite special means be taken to bring the deficient children up to certain standards, without causing undesirable 'overlearning' by the more gifted children. Certain experimental work to this end has been carried out by him and others, but probably much more must be done before an authoritative program for securing certain minimum standards for all or nearly all pupils can be arranged.

THE CAUSES OF INDIVIDUAL DIFFERENCES

The differences found among children of the same grade in the same city are due in large measure to inborn differences in their original natures. If, by a miracle, the children studied by Courtis, or by Woody, or by Kruse had all received exactly the same nurture from birth to date, they would still have varied greatly in arithmetical ability, perhaps almost as much as they now do vary.

The evidence for this is the general evidence that variation in original nature is responsible for much of the eventual variation found in intellectual and moral traits, plus certain special evidence in the case of arithmetical abilities themselves.

Thorndike found [05] that in tests with addition and multiplication twins were very much more alike than siblings^[24] two or three years apart in age, though the resemblance in home and school training in arithmetic should be nearly as great for the latter as for the former. Also the young twins (9-11) showed as close a resemblance in addition and multiplication as the older twins (12-15), although the similarities of training in arithmetic have had twice as long to operate in the latter case.

If the differences found, say among children in grade 6 in addition, were due to differences in the quantity and quality of training in addition which they have had, then by giving each of them 200 minutes of additional identical training the differences should be reduced. For the 200 minutes of identical training is a step toward equalizing training. It has been found in many investigations of the matter that when we make training in arithmetic more nearly equal for any group the variation within the group is not reduced.

On the contrary, equalizing training seems rather to increase differences. The superior individual seems to have attained his superiority by his own superiority of nature rather than by superior past training, for, during a period of equal training for all, he increases his lead. For example, compare the gains of different individuals due to about 300 minutes of practice in mental multiplication of a three-place number by a three-place number shown in Table 14 below, from data obtained by the author [08].^[25]

TABLE 14

THE EFFECT OF EQUAL AMOUNTS OF PRACTICE UPON INDIVIDUAL DIFFERENCE IN
THE MULTIPLICATION OF THREE-PLACE NUMBERS

	AMOUNT		PERCENTAGE OF CORRECT FIGURES	
	Initial Score	Gain	Initial Score	Gain
Initially highest five individuals	85	61	70	18
next five "	56	51	68	10
next six "	46	22	74	8
next six "	38	8	58	12
next six "	29	24	56	14

THE INTERRELATIONS OF INDIVIDUAL DIFFERENCES

Achievement in arithmetic depends upon a number of different abilities. For example, accuracy in copying numbers depends upon eyesight, ability to perceive visual details, and short-term memory for these. Long column addition depends chiefly upon great strength of the addition combinations especially in higher decades, 'carrying,' and keeping one's place in the column. The solution of problems framed in words requires understanding of language, the analysis of the situation described into its elements, the selection of the right elements for use at each step and their use in the right relations.

Since the abilities which together constitute arithmetic ability are thus specialized, the individual who is the best of a thousand of his age or grade in respect to, say, adding integers, may occupy different stations, perhaps from 1st to 600th, in multiplying with integers, placing the decimal point in division with decimals, solving novel problems, copying figures, etc., etc. Such specialization is in part due to his having had, relatively to the others in the thousand, more or better training in certain of these abilities than in others, and to various circumstances of life which have caused him to have, relatively to the others in the thousand, greater interest in certain of these achievements than in others. The specialization is not wholly due thereto, however. Certain inborn characteristics of an individual predispose him to different degrees of superiority or inferiority to other men in different features of arithmetic.

We measure the extent to which ability of one sort goes with or fails to go with ability of some other sort by the coefficient of correlation between the two. If every individual keeps the same rank in the second ability—if the individual who is the best of the thousand in one is the best of the group in the other, and so on down the list—the correlation is 1.00. In proportion as the ranks of individuals vary in the two abilities the coefficient drops from 1.00, a coefficient of 0 meaning that the best individual in ability A is no more likely to be in first place in ability B than to be in any other rank.

The meanings of coefficients of correlation of .90, .70, .50, and 0 are shown by Tables 15, 16, 17 and 18.^[26]

TABLE 15

DISTRIBUTION OF ARRAYS IN SUCCESSIVE TENTHS OF THE GROUP WHEN $r = .90$

	10TH	9TH	8TH	7TH	6TH	5TH	4TH	3TH
1st tenth					.1	.4	1.8	6
2d tenth			.1	.4	1.4	4.7	11.5	2
3d tenth		.1	.5	2.1	5.8	12.8	21.1	2
4th tenth		.4	2.1	6.4	12.8	20.1	23.8	2
5th tenth	.1	1.4	5.8	12.8	19.3	22.6	20.1	1

	10TH	9TH	8TH	7TH	6TH	5TH	4TH	3TH
6th tenth	.4	4.7	12.8	20.1	22.6	19.3	12.8	4.7
7th tenth	1.8	11.5	21.2	23.8	20.1	12.8	6.4	2.1
8th tenth	6.6	23.5	27.4	21.1	12.8	5.8	2.1	.4
9th tenth	22.4	36.0	23.5	11.5	4.7	1.4	.4	.1
10th tenth	68.7	22.4	6.6	1.8	.4	.1	.1	.1

TABLE 16

DISTRIBUTION OF ARRAYS IN SUCCESSIVE TENTHS OF THE GROUP WHEN $r = .70$

	10TH	9TH	8TH	7TH	6TH	5TH	4TH	3TH
1st tenth		.2	.7	1.5	2.8	4.8	8.0	13.4
2d tenth	.2	1.2	2.6	4.5	7.0	9.8	13.4	14.9
3d tenth	.7	2.6	5.0	7.3	10.0	12.5	14.9	14.8
4th tenth	1.5	4.5	7.3	9.8	12.0	13.7	14.8	13.7
5th tenth	2.8	7.0	10.0	12.0	13.4	14.0	13.7	12.0
6th tenth	4.8	9.8	12.5	13.7	14.0	13.4	12.0	9.8
7th tenth	8.0	13.4	14.9	14.8	13.7	12.0	9.8	7.3
8th tenth	13.0	17.3	16.7	14.9	12.5	10.0	7.3	4.5
9th tenth	22.3	21.7	17.3	13.4	9.8	7.0	4.5	2.6
10th tenth	46.7	22.3	13.0	8.0	4.8	2.8	1.5	.8

TABLE 17

DISTRIBUTION OF ARRAYS OF SUCCESSIVE TENTHS OF THE GROUP WHEN $r = .50$

	10TH	9TH	8TH	7TH	6TH	5TH	4TH	3TH
1st tenth	.8	2.0	3.2	4.6	6.2	8.1	10.5	13.4
2d tenth	2.0	4.1	5.7	7.3	8.8	10.5	12.2	14.9
3d tenth	3.2	5.7	7.4	8.9	10.0	11.2	12.3	14.8
4th tenth	4.6	7.3	8.8	9.9	10.8	11.6	12.0	13.7

	10TH	9TH	8TH	7TH	6TH	5TH	4TH	3TH
5th tenth	6.2	8.8	10.0	10.8	11.3	11.5	11.6	11.7
6th tenth	8.1	10.5	11.2	11.6	11.5	11.3	10.8	10.4
7th tenth	10.5	12.2	12.3	12.0	11.6	10.8	9.9	8.9
8th tenth	13.9	14.1	13.3	12.3	11.2	10.0	8.8	7.7
9th tenth	18.9	16.4	14.1	12.2	10.5	8.8	7.3	6.1
10th tenth	31.8	18.9	13.9	10.5	8.1	6.2	4.6	3.4

TABLE 18

DISTRIBUTION OF ARRAYS, IN SUCCESSIVE TENTHS OF THE GROUP WHEN $r = .0$

	10TH	9TH	8TH	7TH	6TH	5TH	4TH	3TH
1st tenth	10	10	10	10	10	10	10	10
2d tenth	10	10	10	10	10	10	10	10
3d tenth	10	10	10	10	10	10	10	10
4th tenth	10	10	10	10	10	10	10	10
5th tenth	10	10	10	10	10	10	10	10
6th tenth	10	10	10	10	10	10	10	10
7th tenth	10	10	10	10	10	10	10	10
8th tenth	10	10	10	10	10	10	10	10
9th tenth	10	10	10	10	10	10	10	10
10th tenth	10	10	10	10	10	10	10	10

The significance of any coefficient of correlation depends upon the group of individuals for which it is determined. A correlation of .40 between computation and problem-solving in eighth-grade pupils of 14 years would mean a much closer real relation than a correlation of .40 in all 14-year-olds, and a very, very much closer relation than a correlation of .40 for all children 8 to 15.

Unless the individuals concerned are very elaborately tested on several days, the correlations obtained are "attenuated" toward 0 by the "accidental" errors in the original measurements. This effect was not known until 1904; consequently the correlations in the earlier studies of arithmetic are all too low.

In general, the correlation between ability in any one important feature of computation and ability in any other important feature of computation is high. If we make enough tests to measure each individual exactly in:—

- (A) Subtraction with integers and decimals,

- (B) Multiplication with integers and decimals,
- (C) Division with integers and decimals,
- (D) Multiplication and division with common fractions, and
- (E) Computing with percents,

we shall probably find the intercorrelations for a thousand 14-year-olds to be near .90. Addition of integers (*F*) will, however, correlate less closely with any of the above, being apparently dependent on simpler and more isolated abilities.

The correlation between problem-solving (*G*) and computation will be very much less, probably not over .60.

It should be noted that even when the correlation is as high as .90, there will be some individuals very high in one ability and very low in the other. Such disparities are to some extent, as Curtis ['13, pp. 67-75] and Cobb ['17] have argued, due to inborn characteristics of the individual in question which predispose him to very special sorts of strength and weakness. They are often due, however, to defects in his learning whereby he has acquired more ability than he needs in one line of work or has failed to acquire some needed ability which was well within his capacity.

In general, all correlations between an individual's divergence from the common type or average of his age for one arithmetical function, and his divergences from the average for any other arithmetical function, are positive. The correlation due to original capacity more than counterbalances the effects that robbing Peter to pay Paul may have.

Speed and accuracy are thus positively correlated. The individuals who do the most work in ten minutes will be above the average in a test of accuracy. The common notion that speed is opposed to accuracy is correct when it means that the same person will tend to make more errors if he works at too rapid a rate; but it is entirely wrong when it means that the kind of person who works more rapidly than the average person is likely to be less accurate than the average person.

Interest in arithmetic and ability at arithmetic are probably correlated positively in the sense that the pupil who has more interest than other pupils of his age tends in the long run to have more ability than they. They are certainly correlated in the sense that the pupil who 'likes' arithmetic better than geography or history tends to have relatively more ability in arithmetic, or, in other words, that the pupil who is more gifted at arithmetic than at drawing or English tends also to like it better than he likes these. These correlations are high.

It is correct then to think of mathematical ability as, in a sense, a unitary ability of which any one individual may have much or little, most individuals possessing a moderate amount of it. This is consistent, however, with the occasional appearance of individuals possessed of very great talents for this or that particular feature of mathematical ability and equally notable deficiencies in other features.

Finally it may be noted that ability in arithmetic, though occasionally found in men otherwise very stupid, is usually associated with superior intelligence in dealing with ideas and symbols of all sorts, and is one of the best early indications thereof.

FOOTNOTES

[1] The following and later problems are taken from actual textbooks or courses of study or state examinations; to avoid invidious comparisons, they are not exact quotations, but are equivalents in principle and form, as stated in the preface.

[2] The work of Mitchell has not been published, but the author has had the privilege of examining it.

[3] The form of Test 6 quoted here is that given by Curtis ['11-'12, p. 20]. This differs a little from the other series of Test 6, shown on pages 43 and 44.

[4] Eight or ten times *in all*, not eight or ten times for each fact of the tables.

[5] The facts concerning the present inaccuracy of school work in arithmetic will be found on pages 102 to 105.

[6] McLellan and Ames, *Public School Arithmetic* [1900].

[7] These concern allowances for two errors occurring in the same example and for the same wrong answer being obtained in both original work and check work.

[8] The very early learning of 2×2 , 2×3 , 3×2 , 2×4 , 4×2 , 3×3 , and perhaps a few more multiplications is not considered here. It is advisable. The treatment of 0×0 , 0×1 , 1×0 , etc., is not considered here. It is probably best to defer the ' $\times 0$ ' bonds until after all the others are formed and are being used in short multiplication, and to form them in close connection with their use in short multiplication. The ' $0 \times$ ' bonds may well be deferred until they are needed in 'long' multiplication, 0×0 coming last of all.

[9] See page 76.

[10] At the end of a volume or part, the count may be from as few as 5 or as many as 12 pages.

[11] Certain paragraphs in this and the following chapter are taken from the author's *Educational Psychology*, with slight modifications.

[12] It should be noted that just as concretes give rise to abstractions, so these in turn give rise to still more abstract abstractions. Thus founness, fiveness, twentyness, and the like give rise to 'integral-number-ness.' Similarly just as individuals are grouped into general classes, so classes are grouped into still more general classes. Half, quarter, sixth, and tenth are general notions, but 'one ...th' is more general; and 'fraction' is still more general.

[13] They may, of course, also result in a fusion or an alternation of responses, but only rarely.

[14] The more gifted children may be put to work using the principle after the first minute or two.

[15] If desired this form may be used, with the appropriate difference in the form of the questions and statements.

$$\begin{array}{r} 232 \\ \underline{30} \\ 000 \\ \underline{696} \\ 6960 \end{array}$$

[16] Curtis finds in the case of addition that "of all the individuals making mistakes at any given time in a class, at least one third, and usually two thirds, will be making mistakes in carrying or copying."

[17] Facts concerning the conditions of learning in general will be found in the author's *Educational Psychology*, Vol. 2, Chapter 8, or in the *Educational Psychology, Brief Course*, Chapter 15.

[18] See Thorndike ['00], King ['07], and Heck ['13].

[19] A special type could be constructed that would use a large type body, say 14 point, with integers in 10 or 12 point and fractions much larger than now.

[20] It will be still better if the 4 is replaced by an open-top 4.

[21] For an account in English of their main findings see Howell ['14], pp. 149-251.

[22] In his *How We Think*.

[23] Compiled from data on p. 89 of Kruse ['18].

[24] Siblings is used for children of the same parents.

[25] Similar results have been obtained in the case of arithmetical and other abilities by Thorndike ['08, '10, '15, '16], Whitley ['11], Starch ['11], Wells ['12], Kirby ['13], Donovan and Thorndike ['13], Hahn and Thorndike ['14], and on a very large scale by Race in a study as yet unpublished.

[26] Unless he has a thorough understanding of the underlying theory, the student should be very cautious in making inferences from coefficients of correlation.

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